Orienting to Chance

Probabilism and the Future of Social Theory

Michael Strand

mstrand@brandeis.edu

Omar Lizardo

olizardo@soc.ucla.edu

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Introduction – Two Thought Experiments

> *Like all men in Babylon, I have been pro-consul; like all, I have been a slave. I have known omnipotence, ignominy, imprisonment … I owe that almost monstrous variety to an institution—the Lottery—which is unknown in other nations, or at work in them imperfectly or secretly.*
>
> ~ Jorge Luis Borges, "The Lottery in Babylon"[1]

> *The principles of justice are chosen behind a veil of ignorance. This ensures that no one is advantaged or disadvantaged in the choice of principles by the outcome of natural chance or the contingency of social circumstances. Since all are similarly situated and no one is able to design principles to favor his particular condition, the principles of justice are the result of a fair agreement or bargain.*
>
> ~ John Rawls, *A Theory of Justice*[2]

A lottery that decides the fate of everything, each event oscillating wildly between fixity and change, all dictated by an opaque decider. A veil that hides the familiar, even the reasonable, from our eyes, for those who put themselves behind it, they forget everything, even their own self-interest. Jorge Luis Borges' short story "The Lottery and Babylon" and John Rawls' idea of the "veil of ignorance" from his *Theory of Justice* are not often put into conversation,[3] though they should be. They share a common theme: namely, that by taming *chance* or inviting it in, one could, in principle, reconstruct society.

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[1] Jorge Luis Borges, "The Lottery in Babylon," *Collected Fictions,* translated by Andrew Hurley. (New York: Penguin, 1998), 101-106, quotations are on p. 101.

[2] John Rawls, *A Theory of Justice* (Cambridge: Harvard University Press, 1971), 12.

[3] Though see Lorraine Daston, "Life, Chance and Life-Chances," *Daedalus* 137, no 1 (2008): 5-14

The lottery in Borges' fictional Babylon starts on a small enough scale. "Barbers would take a man's copper coins and give back rectangles made of bone or parchment and adorned with symbols." Then a drawing would be held, and "those smiled upon by fate would, with no further corroboration by chance, win coins minted of silver." After initial enthusiasm, public interest began to wane, as this lottery had "no moral force whatsoever." So, the designers sweetened the deal: for those who bought the rectangles and played the game, the stakes were not only lucky draws, and winning mint coins, but also *unlucky* draws, and paying a not-inconsiderable fine. These stakes piqued the public's interest, and those who did not play were accused of having no sense of adventure.

Soon thereafter "the Company" who administered the lottery obtained power comparable to an "ecclesiastical, metaphysical force."[4] A movement developed on the "fair and reasonable demand" that everyone be able "to take part in the Lottery equally." The "Lottery was made secret, free of charge, and open to all … [T]he sacred drawings, which were held in the labyrinths of the gods every sixty nights and determined each man's destiny until the next drawing. The consequences were incalculable."[5] Soon anything that happened that was not expected became suspicious, paranoiac, conspiratorial: *the Company must be involved*, and it seemed to be extending its reach. "The drunken man who blurts out an absurd command, the sleeping man who suddenly turns and chokes to death the woman sleeping at his side—are they not perhaps implementing one of the Company's secret decisions? That silent functioning, like God's, inspires all manner of conjectures." If, because of the Lottery, we can really expect nothing, then anything is possible; but likewise, if nothing *should* happen, at least not in general, then anything *could* happen. Such is the twisted logic the Babylonians had to learn to follow.

For Rawls, famous philosopher of justice and noted opponent of chance, the Babylonian Lottery would seem close to a manifestation of hell on Earth, encouraging the very opposite of justice and denying its close cousin rationality from having any influence on the world. In Rawls' "original position," no one knows their place in society: not their class position, job, or status; neither "does anyone know their fortune in the distribution of natural assets and abilities, intelligence, strength and the like."[6] They cannot even be so fortunate as to already have "conceptions of the good." A blank slate is all that can prevent the ravaging effects of "natural chance or the contingency of social circumstances," which, for Rawls, is the main hindrance to realizing a just society. If all are similarly situated, at least in their imagination, then "principles of justice" will appear as a "result of a fair agreement or bargain." In the name of self-interest, these principles (and perhaps policies) would be as equitable as possible—applying to everyone in spite of how brightly or darkly chance shines its fickle light on them.[7] If I were the poorest in society, what would I need? If I were the richest, what could I do without? Questions like these would finally be considered, but only by ignoring actual circumstances. The "initial situation that is fair" is the one that should be guaranteed. And this "initial situation" is the world as it appears from "the bottom," for it is duly recognized that *all* are at the mercy of chance.

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[4] Borges, "The Lottery in Babylon," 102.

[5] Ibid, 103.

[6] Rawls, *A Theory of Justice,* 12.

Borges and lotteries, Rawls and ignorance: the two make an unusual pair. To take chance as seriously as they do makes for strange bedfellows. Rawls and Borges acknowledge chance as primary, not secondary; it is certainly no anomaly or error. Yet, from this common starting point, the two thought experiments diverge: the Babylonian Lottery *invites chance in* to the maximum extent, while the veil of ignorance imagines a means for completely *taming* it. The Lottery creates surprise and endless contingency, while luck counts as failure through the veil of ignorance. For the Lottery, equity means making everyone equally subject to arbitrariness: all fates are unwarranted and undeserved. Behind the veil, equity consists of the elimination of arbitrariness: only deserved fates, those decided on strict criteria, are legitimate.

Thus, Borges and Rawls kindle the imagination with visions of fairness.[8] At the same time, they suggest something more general. Social order, its moral sensibility, its events and catastrophes, its promise and peril, bears an unmistakable and intimate link to *chance*.

The French philosopher Gilles Deleuze uses Borges's lottery to show the difference between a game of skill and a game of chance, or in his terms, a "known" versus a "pure" game.[9] These are recipes, in Deleuze's view, for constructing social order. Inseparably, they are also interrogations of the nature of chance. In the game of skill, (1) a set of rules must preexist the game, and they cannot change in the middle of a game or between games; (2) the rules create expectations that "divide and apportion chance, that is, hypotheses of loss or gain (what happens if …)"; (3) these expectations organize the gameplay as a "plurality of throws, which are really and numerically distinct." Each "throw" (or play, action) distributes consequences, and not just randomly, but arising from the "flow of the game"; finally (4) these "throws" and their consequences decide the alternative of "victory or defeat." Skilled games "*retain chance only at certain points*" (italics in the original). They are Rawlsian spheres organized to prevent luck from affecting the outcomes of tests, allowing only talent, hard work, virtue—*anything* not attributable to chance.

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[7] Ibid, 13

[8] Daston, "Life, Chance and Life-Chances," 6.

[9] Gilles Deleuze, *The Logic of Sense* (London: The Athlone Press, 1990/1969), 58.

In "pure" games, by contrast, there are (1) no preexisting rules, and whatever rules come to can be reinvented in every move or throw; (2) rather than "apportion" or "distribute" chance, a pure game "affirms chance and endlessly ramifies it with each throw"; (3) there is no way to make the throws, moves, or plays in a game distinct from each other because there is no sequence or history, no link between action that could make up a coherent, whole game; we cannot even calculate probabilities in pure games, so deeply do they "insinuate chance"; (4) finally, as Deleuze states in exasperation, "such a game—without rules, with neither winner nor loser, without responsibility, a game of innocence, a caucus-race, in which skill and chance are no longer distinguishable—seems to have no reality. Besides, it would amuse no one."[10] Pure games will "make chance into an object of affirmation," and perhaps, for this reason, such games are "reserved for thought and art … [T]here is nothing but victories for those who know how to play, that is, how to affirm and ramify chance, instead of dividing it *in order to* dominate it, *in order* to wager, *in order to* win."[11] These are Borgesian spheres: worlds organized to *avoid* predictability.

Can we imagine social order constructed by allowing a little more Rawls or a little more Borges, more a game of skill or a pure game; in short, can social order exist as small or large versions of *taming chance* or *inviting chance in*? This question is not as abstract as it might seem. Proposals have been made recently for elite college admissions and competitive scientific research funding to be decided by lottery.[12] Such proposals speak the language of fairness. Much like Babylon's lottery and Deleuze's pure game, they also provide a counterfactual. Lotteries are still exceptional; yet as an arbiter, infallible because performative, they can be right. We live in an age in which, from wellness practices and life coaches to educational prep and retirement planning, life cannot just "happen"; it must be *a project:* ordered and planned from start to finish.[13] When everything is a potential risk, there is no room to fail (or, perhaps, nothing to lose). Morality is written in the imperative and knowledge in the indicative, like law. All the while, chance-less order becomes possible on a scale unimaginable before.

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[10] Ibid, 59.

[11] Ibid, 59- 60.

[12] Natasha Warikoo, "Why Elite Colleges Should Use a Lottery to Admit Students" *The Conversation* (8 January 2019); Dominique Baker and Michael Bastedo, "What if We Left it Up to Chance? Admissions Lotteries and Equitable Access to Selective Colleges" *Educational Researcher* 51, no. 2 (2021): 134-45. David Adam, "Science funders gamble on grant lotteries" *Nature* (20 November 2019); Mengyao Liu et al "The acceptability of using a lottery to allocate research funding: a survey of applicants." *Research Integrity and Peer Review* 5, no 3 (2020): 1-7.

One pocket of social order seeks to eliminate chance, in whatever form, leaving no stone unturned to control futures and fates, just as a good Rawlsian (or upper-middle class parent) might do.[14] Another pocket invites chance in; it "says yes to who or what *turns up*," much like a good Borgesian (or freewheeling artist) might do.[15] Between the two rests a world of difference, yet how they deal with chance defines *how* they are orders. Rawls and Borges would lead us to expect nothing different. Life planning and the subduing of chance over here, sudden transformations of life via the invitation of chance over there: these are not incomparable phenomena. They sit alongside each other as ways of *creating and changing probabilities and possibilities*. Statistical calculation is secondary to these matters of probabilistic construction and (sometimes dramatic) reconstruction.

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The cultural turn in the social sciences brought into view the significance of the contingent and the particular; it seemed to show us that any attempt to explain something by singular, inevitable forces, working in the same way everywhere, was misguided (at the very least). The cultural turn rests on the idea that meaning not only activates the force in question, the consequences also become variable. Here culture will lodge its appeal. Originally, causality had preceded meaning; these two authorities stood opposed to one another. No longer—those affected by causal forces cannot be oriented except *by meaning*.[16] Culture introduces contingency and particularity into the explanatory matrix. Sociology can no longer identify the equivalent of laws without a subject in a world without action. Causal force is merely a potential that hinges on meaning. To be "made meaningful"—sociologists cannot know or predict this in advance.

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[13] Michal Pagis, "Fashioning Futures: Life Coaches and the Self-Made Identity Paradox," *Sociological Forum* 32, no. 4 (2016): 1083-1103.

[14] Thus, the "possessor of economic and social capital" uses it to control the futures ("objective probabilities") created by economic and educational tests, perhaps in spite of all outward appearances of personal kindness; Pierre Bourdieu, *Outline of a Theory of Practice* (Cambridge: Cambridge University Press, 1977), 188-89.

[15] For an ethics of such chance-inviting "yea-saying," see Jacques Derrida, "Step of Hospitality/No Hospitality" in *Of Hospitality* (Stanford: Stanford University Press, 2000), especially p. 77.

[16] Isaac Reed, *Interpretation and Social Knowledge: On the Use of Theory in the Human Sciences* (Chicago: University of Chicago Press, 2011).

A kind of canonization trial unfolds. In the 1930s, the sociologist Talcott Parsons insisted upon a non-positivist foundation for the human sciences rooted in the study of action. Specifically, this meant sociological knowledge not including the "subjective point of view" would end up displacing it with "positive science," making it our only possible relation to reality.[17] Such a displacement was the very definition of positivism. Parsons reacts against an old tradition, associated with Auguste Comte and his claim that sociology was a kind of third-person authoritative knowledge.[18] For Comte, there was only one way to know the world (sociology), and for those who had this knowledge, they could rightfully claim to rule the world.[19] Beliefs did not matter, neither did meaning. For Comte, meaning and believing were not different; they were also not that important. Both were simply inferior ways of knowing. Knowledge of the authoritative variety, translating into politics, rested on laws of the social world, particularly those that bestowed upon the knower a *predictive* capacity—control of the future and over possibility. For Parsons, probability merely encoded this positivism, overshadowing belief with knowledge. Action would never be a sacrificial victim upon this altar. Thus, to avoid positivism, action could not be probabilistic: it could not be more or less present, nor could it be subject to independent variation. It had to be essential, instead, recognized as a "frame of reference" or "scheme" with certain inalienable features ("effort," "subjective meaning," "values"), none of which are observable *hic et nunc*.

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[17] Talcott Parsons, *The Structure of Social Action* (New York: Free Press, 1937). For Parsons, the crucial need for a theory of action is to prevent the "peculiar point of view" from taking hold that presupposes that "positive science constitutes man's sole possible significant relation to external (nonego) reality." In this sense, "scientifically verifiable knowledge of the situation" is not the "only significant orientating medium in the action system" (61). This implies, firstly, and contrary to idealists, there does exist a nonego (objective) reality to which actors relate, and it provides the "material conditions" of action; secondly, and contrary to positivists, the reality that produces action is not merely a product of causal laws emergent from nonego "objects," but implicated instead in the "subjective point of view" that applies meanings to the action situation, as proximate forms of shared norms and values.

[18] Sociology, for Comte, would be a scientific field like any other in describing "an invariable natural order, independent of us and our action, in which our intervention can occasion none but secondary modifications". This order could be uncovered, documented, and contemplated, but stood apart from creation and intervention. "The main cause of [this] superiority of the social to the individual organism is according to an established law," Comte argued, which led him to state the divide between authoritative knowledge and persons with their arbitrary beliefs in bold and assured terms: "True liberty is nothing else than a rational submission to the preponderance of the laws of nature, in release from all arbitrary personal dictation." This approach implied that an authoritative belief would consist of knowledge, and it would be distinguished from preexisting belief because it knew more than could be known from that point of view. For Comte, there was no doubt the sociologist had authority in such a scenario. Auguste Comte, *The Positive Philosophy* (London: Trubner and Co, 1875), quotations are from p. 829, 508, 435. For a good account of "authoritative knowledge" and sociology, see John Levi Martin, "Authoritative Knowledge and Heteronomy in Classical Sociological Theory," *Sociological Theory* 16, no. 2 (1998): 99-130.

[19] Comte's claims here find a lineage running through Machiavelli, and his hatred of *fortuna*, and Carl Schmitt, and his loathing for chance, with all three of them drawing a link between authority, knowledge and the reduction of unpredictability. Hannah Pitkin, *Fortune is a Woman: Gender and Politics in the Thought of Niccolo Machiavelli* (Berkeley: University of California Press, 1984). J.G.A. Pocock, *The Machiavellian Moment* (Princeton: Princeton University Press, 2016/1975), 97. Carl Schmitt, *Legality and Legitimacy,* translated by Jeffrey Seitzer (Durham, NC: Duke University Press, 2004/1932). Kari Palonen, "The State as a 'Chance' Concept: Max Weber's Desubstantialization and Deneutralization of the Concept," *Max Weber Studies* 11, no. 1: 99-117.

The cultural turn took the advice.[20] Probability was not a focus of meaning-making but had its own jurisdiction. Expectations, anticipations, and orientations to the future could be acknowledged, but only as beliefs and interpretations *about* the future, as if we could not have a direct connection, as if there was always something in between. Rhythms, tendencies, and patterns did at least acquire an aesthetic significance. Yet arguments like these tend to replicate a similar distinction as appears when Parsons rejects Comte: probabilistic reasoning is authoritative knowledge, and the main line of defense against it is culture.

***

In this book, we try to envision social theory as if this never happened, as if we did not stand to inherit this history, as if interpretation and probability were not so rigidly separated. What if social theory stood to inherit a different history, mostly forgotten and misunderstood, in which this separation did not occur? We argue that some of the biggest influences on the cultural turn (Max Weber, Pierre Bourdieu) fit better as part of the lost tradition we seek to recover. Though preceding it, *probabilism* comes into focus only *after* the cultural turn, and it shares many of the latter's commitments, particularly its opposition to the Comtean ambition of authoritative knowledge. A post-cultural sociology will not ignore contingency or particularity, though it will not make these singular to cultural frameworks and the "contingencies of interpretation." A post-cultural, *probabilistic* sociology will attend, instead, to probabilistic orders as the more-than-nominal referent for rhythms of social action that are nothing if not *optimistic*.

In doing so, probabilism says that we do not *only* need statistics to talk about probability.[21] The typicality, riskiness, and surprise of social action are empirically inspectable observations on probability independent of the tabulated frequencies that have become more or less synonymous with getting access to the "objective" dimensions of social life. Just consider the observations that Borges makes of mythical Babylon. If all that we can safely expect is that everything will always be different, a class structure, as we understand it, would be impossible because nothing would make it durable enough to repeat into the future. We could expect nothing of it. We would not invest in economic matters with urgency, as we would have to expect what *could* happen.[22] With the passing of each year, the Lottery reorders everything: who we are, what we do, the categories we use to classify and appraise. We would have no claim to identity, as that requires durability. As the Babylonians themselves know all too well: even morality cannot survive this scenario.

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[20] See Richard Biernacki, "Method and Metaphor after the New Cultural History," in *Beyond the Cultural Turn.* Edited by Victoria Bonnell and Lynn Hunt (Berkeley: University of California Press, 1999), 62-95.

[21] Randall Collins, "Statistics versus Words," *Sociological Theory* 2 (1984): 329-362.

Observations like these leave us with a keen sense for what Babylon must be like, independently of anything else we know about it. To know how chance is tamed or invited in can tell us a lot about a place. What neither Borges nor Rawls could have anticipated, however, is how the *opacity* of both the Babylonian Lottery and the veil of ignorance, which figures only in thought experiments for them, would mirror the opacity of machine learning and the outputs of artificial intelligence all too familiar today.[23] The Lottery makes interventions into everyday life as baffling as search engine results can be (or the decisions of baseball managers); credit scores (or impact factors) produced from behind a "veil" of calculation claim objectivity freed from the contingencies of the world (and its biases). This has been attributed, and critiqued, as signs and laments of *the algorithmic:* what it means, what it does and where it is going. In all cases, what we are talking about are not simply tokens of knowledge, but a deep source of probability, literally existing.

Borges and Rawls needed to conjure up scenarios and stories to *imagine* this strange opacity. We no longer need a similar imagination. We only need to examine the digital black boxes that surround us. This book develops an approach to social theory attentive to this and how it is significant for social life as much as the thought experiments of Borges and Rawls tell us it does. Necessarily, it is a social theory adaptable to data science and the algorithm, and more particularly to the contrast Borges and Rawls anticipate in their pre-digital musings, a contrast that can appear, today, like a developing battleground pitting the opaque world of data-derived Babylons and veils against an all-too-human lived reality. It is also a social theory that avoids the problems of authoritative knowledge while also not falling into the pitfalls of those approaches that claim to avoid it. To achieve all of this, we argue, requires that we be counterintuitive, at least relative to intuitions that have been historically shaped by an equivocation like *probability = frequency*. Quite the contrary, as we will contend: probability is that which, with due respect to turtles, extends *almost* all the way down.

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[22] "Any mode of production," Marx argued, must take form as tradition and law "if it is to assume social stability and independence from mere chance and arbitrariness. These are the very form of its social stability and therefore its relative freedom from mere arbitrariness and mere chance." This leaves us to consider whether tradition and law are fundamentally what capitalism *is* as a taming of chance. They remove an arbitrariness enough for capitalism, as an order of predictability, to be nameable, expected, and general, making it possible to make the kinds of claims we make about it or, better, *using* it. Karl Marx, *Capital: A Critique of Political Economy, Vol. 3* (New York: Penguin, 1991/1894), 929.

[23] Jenna Burrell, "How the Machine 'Thinks': Understanding Opacity in Machine Learning Algorithms," *Big Data & Society* 3, no. 1 (2016): 1-12.

Chapter 1 - What is Probabilism?

> *Despite the upheavals in science in the over two millennia separating Aristotle from the Paris of Claude Bernard, they shared at least one article of faith: science was about causes, not chance.*
>
> ~ Gerd Gigerenzer, Zeno Swijtink, Theodore Porter, Lorraine Daston, John Beatty, Lorenz Kruger, *The Empire of Chance*

Data seems to be everywhere these days. The "data science revolution" has been credited with everything from putting an end to theory to creating a fourth approach to scientific discovery, as prestigious and groundbreaking as experimentation, modeling, and computation.[24] Data science programs and initiatives have popped up at universities across the globe. Data science in corporations is all the rage. What do these trends mean for the human sciences? What does data science mean for sociology in particular? We can answer these questions right now, at the start: data science tells sociology, the human sciences, and purveyors of social knowledge everywhere, that they need to be *probabilistic*.

A statement like this probably does not land well. We can hear the rebuttals already. Aren't the human sciences *already* probabilistic? Aren't statistics crucial to these enterprises, especially sociology? Isn't anyone who undergoes any training in social science told (often in a stern voice) that we do not deal in laws or certainties, but only in probabilities? Is it not the case that we are all, regardless of whether we make our living from social science or not, steeped in the language of percentages and chances? We can answer all these questions affirmatively, and yet the statement above will still apply. Data science will still have a point.

This book does not join the chorus advocating for data science. Quite the contrary, we propose taking an alternate route, though one made timely by the intrigue of data science. If human scientists are to think probabilistically, data science should not be their first option. Currently, it is their *only* option. We propose a different approach to thinking probabilistically, one rooted in the sociological tradition, one that seeks a probabilistic vocabulary for interpreting and explaining social life with starting points in action and experience (rather than method), and which counts among its practitioners luminaries in the history of the social sciences who made critical breakthroughs by thinking probabilistically. This approach has gone largely unnoticed until now. It is time, we believe, to revisit and recover it. First things first: what is *probabilism*?

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[24] Chris Anderson, "The End of Theory," *Wired* 16, no. 7 (2008); University of Michigan Provost Martha Pollack speaking at the founding of the University of Michigan Data Science Initiative; "U-Michigan Launches $100 Million Data Science Initiative," *University of Michigan News* (8 September 2015).

Two Main Forms of Probabilism: Weak and Strong

We start by making a simple distinction: let us call it strong versus weak probabilism. Weak probabilism is what each of these questions conveys. This is the probability of statistics and formulas, of frequency counts and quantification. Weak probabilism is what you learn in a statistics class. Software like *Stata* and *R* and mathematical concepts like p-values, logged odds, R-squared, and eigenvectors are its toolkit. Weak probabilism uses data sets to manufacture knowledge in the form of percentages, statistical frequencies, and more generally models built from variables. More technically, a probabilistic statement, according to weak probabilism, assigns a real number r from the interval [0,1] to a proposition q at time t as its probability (e.g., $P_t(q)=r$).

Weak probabilism has enjoyed enormous success since its birth in the mid to late 19th century. Before this time, very few spoke the language of percentages and chances, and likely only at the card table.[25] Now we use this language to speak about and secure some understanding of the most pressing issues of our time, from social injustices to demographic changes, from health crises to climate change. In public discourse, weak probabilism is typically most legible in the form of recommendations and forecasts, signs of the future, indicators in the present. These pervade the lifeworld of moderns.

Weak probabilism has infiltrated knowledge-centric pursuits of every kind, from the role of word frequency counts and data sets in literary scholarship to political polling and marketing research and weather forecasting, likely its most public and visible domain.[26] To speak with conviction about many things today requires some capacity to imagine them sliced and diced into a percentage. More generally, it requires an orientation toward the "future as uncertain," and therefore presenting a potential risk or hope, instead of being cyclical or inevitable. A characteristic arc of modernity, some have claimed, is the representation of time in the form of probabilities.[27] Others have found this integral to "science's rationality" and how the will to truth arrives with the promise of controlling the future.[28] Probability statements rule nothing out and give no guarantees. The future is a promise or a threat when its unknowns assume the form of a percentage, with enough uncertainty to require a decision or a judgment.

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[25] Lorraine Daston, *Classical Probability in the Enlightenment* (Princeton: Princeton University Press, 1995/1980). Ian Hacking, *The Emergence of Probability: A Philosophical Study of Early Ideas about Probability, Induction and Statistical Inference* (Cambridge: Cambridge University Press 1975). Ian Hacking, *The Taming of Chance* (Cambridge: Cambridge University Press, 1990).

All of these are *epistemic* engagements, rooted in data collection. They exemplify the power of weak probabilism. Increasingly, however, the limits of weak probabilism are being revealed, as data science, armed with machine learning and artificial intelligence, promises to turn seemingly *every* instant of time (or action) into a bit of data, surpassing any limitation to those times, places and structured formats in which we purposefully collect it. "Datafication" thus ensues as data is understood to be a constant stream, retrieved from hitherto untapped reservoirs and newly discovered accumulations (like fossil fuel). We should "seek out unfamiliar summaries of observational material," as the pioneering data analyst John Tukey recommended, as "data analysis can, sometimes quite appropriately, precede probability models…progress can come from asking what a specified indicator (a specified function of the data) may reasonably be regarded as estimating." More generally, this would be a way of eliminating a key constraint on data analysis, namely the "test of experience." With enough data, it becomes possible to "use mathematical argument and mathematical results as bases for judgment rather than as bases for proof or stamps of validity."[29] Data science promises to make probabilistic statements (specifically *predictions*) possible about more and more things. If we look closely and attentively enough, and possess adequate technological capacity and know-how, then every instant can, presumably, supply us with data of some kind.

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[26] Phaedra Daipha, *Masters of Uncertainty: Weather Forecasters and the Quest for Ground Truth* (Chicago: University of Chicago Press, 2015).

[27] Ulrich Beck, Anthony Giddens, and Scott Lash, *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order* (Stanford: Stanford University Press, 1994), 9. See also, Ulrich Beck, *Risk Society: Towards a New Modernity* (Beverly Hills: Sage, 1992), 29-30. Jeffrey Alexander, "Modern, Anti, Post, Neo," *New Left Review* 210 (1995): 63-101.

[28] Lorraine Daston, "Life, Chance and Life-Chances," *Daedalus* 137, no 1 (2008): 5-14, see p. 12; Mary Douglas, "Risk and Blame" in *Risk and Blame: Essays in Cultural Theory* (London: Routledge, 1992), 13ff.

[29] John Tukey, "The Future of Data Analysis," *The Annals of Mathematical Statistics* 33, no. 1 (1962): 1-67, quotation is on p. 61.

Tukey was well ahead of his time. Computing has become so powerful and data storage so comparatively abundant since he penned these words, as to make his vision a reality: there appears to be no natural limits to the "observational material" on which data can be gathered. Data on this scale does not require any prior move (from us) to structure it into categories and classifications. It can, instead, base itself on "readymades" rather than "custommades."[30] It can try to reach a standard of "everydayness," allowing data scientists to infer that "Data is people!" so near is the data science map to the territory it datafies.[31] Each instant of the day becomes a possible indicator or index. Every bionic movement, every keystroke, every purchase or path from point A to B: data compiles itself on digital tabulators with human intermediaries not as the recorders but as the suppliers.

Outside a record or metric, outside datafication in other words, we cannot be sure *what* has happened. For some, this may afford us a future without concepts or theory of any kind, as "deductive reasoning is eventually limited because setting a premise in advance of an experiment would constrain the reasoning to match the premise."[32] From this perspective, "theory" conveys something akin to "completed learning" and should therefore be avoided. At best, theory is hypothetical, temporarily filling in gaps for which we do not *yet* have data or have yet to devise an "unfamiliar summary." A truly data-driven approach will appreciate that "inductive reasoning produces no finished status. The results of inferences are likely to alter the inferences already made. It is possible to continue the reasoning indefinitely. The best inductive algorithms can evolve: they can 'learn', they refine their way of processing data … *Permanent learning*, never completed, produces an imperfect but useful knowledge."[33]

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[30] The difference would be between data gathered for a non-specific purpose by a company or government, and a dataset created by a researcher with a specific interest in mind. A "readymade" tends to be big data (e.g. phone records), while a "custommade" is more targeted (e.g., a survey of a sample of the people who made the phone calls). See Matthew Salganik, *Bit by Bit: Social Research in the Digital Age* (Princeton, NJ: Princeton University Press, 2017), 7-8.

[31] Ioanna Constantiou and Jannis Kallinikos, "New Games, New Rules: Big Data and the Changing Context of Strategy," *Journal of Information Technology* 30, no. 1 (2015): 44-57; Rebecca Lemov, "Big Data is People!" *Aeon* (16 June 2016). The reference to map and territory is from Borges and his aptly entitled short story, "On Exactitude in Science": "In time … the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it." Jorge Luis Borges, "On Exactitude in Science" in *Collected Fictions*, translated by Andrew Hurley (New York: Penguin, 1998/1960), 325.

[32] Anderson, "The End of Theory."

[33] Jean-Pierre Malle, "Big Data: Farewell to Cartesian Thinking?" *Paris Tech Review* (15 March 2013).

From Weak to Strong?

Debate over these issues have raged with a little more acrimony than usual given the potential aridity of the topic. Is "data science" just a rebranding of statistics? Or is it new and different?[34] Data science initiatives at universities are common; less common is to find them spearheaded by the statistics department (if there is one), presaging the victory of one side of the "two cultures" of modeling presciently distinguished by the statistician Leo Breiman at the dawn of the century.[35] In at least once sense, the difference is considered to be a difference in goals and tools:

> Classical statistics follows generative modeling. The central goal is inference, that is, to understand how an outcome is related to inputs. The analyst proposes a stochastic model that could have generated the data, and estimates the parameters of the model from the data. Generative modeling leads to simple and interpretable models but often ignores model uncertainty and out-of-sample performance. [Data science] follows predictive modeling. The central goal is prediction, that is, to forecast the outcome for future inputs. The analyst treats the underlying generative model for the data as unknown and considers the predictive accuracy of alternative models on new data. Predictive modeling favors complex models that perform well out of sample, but can produce black-box results that offer little insight on the mechanism linking the inputs to the output.[36]

This would suggest that the promise of data science, with tools like machine learning and algorithms, concepts like "everydayness" and "nearest neighbor," and methods like out-of-sample testing and cross-validation, is a kind of strong program of its own, one that, like the probabilistic sociology we propose, breaks the limits of weak (statistical) probabilism. Considered in this regard, data science proposes a version of strong probabilism from the opposite direction: via data rather than action.

By attempting a fully realized epistemic grasp, data science may potentially absorb *everything,* every instant, whether from a human-contrived world or not, as a data point. Data science therefore seeks continuity between time, in the form of instants, and empirical orders. It does not assign real properties to things it agrees are only ever probable, even though this creates a problem of diminishing returns. New data gathered does not build on the old but displaces it, lending a data-scientific approach a paradoxical objective: "it's not that we haven't learned anything, but rather that we'll *never* learn anything."[37] Permanent learning means that new observations and "unfamiliar summaries" continuously reconstruct and update what data science has previously tracked and measures. As has become particularly clear over the last decade, the uses of data science are not simply *ex post* in this sense (though as minimally *post* as possible); they are also *ex ante*. Data science does not simply represent, it also intervenes.[38]

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[34] David Donoho, "50 Years of Data Science," *Journal of Computational and Graphical Statistics* 26, no. 4 (2017): 745-766.

[35] Leo Breiman, "Statistical Modeling: The Two Cultures," *Statistical Science* 16, no. 3 (2001): 199-231.

[36] Mario Molina and Filiz Garip, "Machine Learning for Sociology," *Annual Review of Sociology* 45 (2019): 27-45, quotation is on p. 29.

Machine learning algorithms learn from the agglomeration of instants gathered as data points. But more than this, they have also been credited as feeding *people forward* through a kind of "loop" into unique behaviors and kinds of sociality; for instance, into groups that were not present or typical before, and whose boundaries were much more porous and indefinite before the data deluge. As Marion Fourcade and Fleur Johns have noted, here we can see an almost perfect example of "reassembling the social" using the instrumentalities of a machine.[39] If machine learning and the AI based on it is perpetually "data hungry" so *we too* become data hungry and develop a "searching disposition." We acquire a "machine-learning self" and are encouraged through various data vectors (search engines, smartphones, social media) to "respond more, interact more, volunteer more," and also to remain "primed to develop a new attitude toward the acquisition of information."[40]

Yet if the social power of this "coding elite" derives from their monopolization of data, their control over the means of prediction and its immense profit potential, a key question still stands before us without a good answer. *Why are predictive algorithms, machine learning and other applications of artificial intelligence so effective at reassembling and constructing social order? Why are they so good at changing the game?*Technology and our near-constant machine interface aside, this is essentially a question about *action*, or how we humans manage the instants of our lives. It implies some compatibility, or at the very least a connection, between data gathered (e.g., unstructured) and action that unfolds in direct relation to probability. To consider what the implications of this are, consider for a moment a probabilistic argument that fits as part of neither statistical weak probabilism nor data science strong probabilism.

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[37] Christopher Phillips, *Scouting and Scoring: How We Know What We Know About Baseball* (Princeton: Princeton University Press, 2019), 248.

[38] Ian Hacking, *Representing and Intervening: Introductory Topics in the Philosophy Of Natural Science*, (Cambridge: Cambridge University Press, 1983).

[39] Marion Fourcade and Fleur Johns, "Loops, Ladder and Links: The Recursivity of Social and Machine Learning," *Theory and Society* 49, no. 5-6 (2020): 803-832.

[40] Ibid, p. 808-09.

Wagering on God

It is not customary these days to speak the language of probabilism when dealing with religious matters. Most people would not find it reasonable to speak of percentages when referring to heaven, hell, nirvana, prophets, angels, or miracles. To give the existence of God a 43% chance, or to answer a religious or spiritual question with a polynomial equation, seems grossly out of place, even humorous.[41] Yet, one prominent example of probabilistic inquiry into *this* unknown did attempt to do just that, using a certain kind of probabilism to propose an answer to the gravest of questions.

The famous "wager" proposed by the philosopher and mathematician Blaise Pascal in the mid-17th century uses probabilism to offer a strikingly direct answer for whether God, and by extension an afterlife, *is* or *is not*. For Pascal, the question itself is "objective," but by this he does not mean that it stands in opposition to what is "subjective." The question needs to be rephrased to be sufficiently objective: not "does God exist?" but, "*should you believe* that God exists?" At this time, "subjective" and "objective" still retained the meaning given to them by medieval nominalism. Objective referred to the "objects of thought" (e.g., collectives, categories), while subjective meant "the objects in themselves" (e.g., individuals). This (pre-Kantian) distinction is closer to what, in a contemporary sense, is meant by "general" and "particular."[42] To answer a question about the existence of God thus meant providing an answer that was "true to the reality of its object," in this case an object (God) capable of dictating the eternal damnation or salvation of anyone who might entertain such a question.

For Pascal, it made perfect sense that probability could provide such an answer since it gives access to general reasonableness. "One is compelled to wager," as Pascal puts it, "it is not voluntary, you are in the game…[When] there is such an infinite life of infinite happiness to be won, one chance of winning against a finite number of possibilities for a loss…[This] eliminates all choice…one must give all."[43] In a contemporary sense, a statement like this likely conjures up a rational choice argument. For Pascal, it conveyed something a little different. To wager on the existence of God meant to orient oneself toward certain chances, much like one would in a game of cards.

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[41] One is reminded here of Douglas Adams' *Hitchhiker's Guide to the Galaxy*, in which Deep Thought, a super-computer designed by the most intelligent species in the universe, takes 7.5 million years to give "the ultimate answer to the question of life, the universe and everything" and comes up with "42."

[42] Lorraine Daston, "How Probabilities Came to be Subjective and Objective," *Historia Mathematica* 21 (1994): 330-344, quotation is on p. 333.

To orient oneself toward the chance of God meant to hold certain expectations in relation to God, expectations that are not understood to be "subjective." Whoever holds these expectations cannot *decide* whether to hold them or not, nor do they invent the chances themselves. Pascal's approach to chance is what we might call *ontical*. His theory applies to a possibility that is essentially out of our hands. We cannot dictate what the afterlife is, objectively speaking, and any answer we give to whether there *is* an afterlife cannot be either true or false: the evidence required to give such an answer is not available to us. Thus, Pascal tries to get us to think about belief in God as a question of probability. To accomplish this, Pascal theorizes something as general (namely, the afterlife) based on its probabilities, and then he draws something particular (an individual's afterlife fate) into that range.

Regardless, then, of what your afterlife fate might be, it will not be *entirely* particular or unique. It will fall within a range of possibilities. Belief in the afterlife is only possible, in Pascal's sense, because we must confront such a fate. We are "already in a game" with such a fate as an outcome. If we lived forever, the question of "the afterlife" would never arise for us; that is obviously not the game we are playing, but neither, for that matter, are we playing a game in which, knowing we will die, we *can* know for certain what happens next. In Pascal's view, our situation should give us reason for hope because it lies between pure necessity (what must happen) and pure contingency (what we cannot even know). Whether Heaven or Hell exists should not be our main concern. We must accept that domain as real but unknowable. What matters more is that we can be the cause of what will happen in any afterlife fate that *might* happen in our case.

Pascal's wager is not weak probabilism at work. He engages in probabilistic reasoning *without* collecting data or counts of frequency. Notably, he also does not seek to make a prediction based on what he learns. He instead plays the role of advisor: based on two possible outcomes, we can *make* one more likely than the other; it is ultimately up to *us* what fate has in store. Contrary to having causes of fate push us around, *we* are the cause. If we currently act as if there were a 20% chance of an afterlife of Heaven or Hell, we could act as if there were a 100% chance. Because we are oriented toward one outcome or the other, because we *expect* one outcome or the other, our disposition *could* bring the outcome about by leading us to act in ways that make one outcome *probable* instead of just possible (although nothing is certain).

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[43] Blaise Pascal, *Pensées,* translated by A.J. Kraislheimer (New York: Penguin 1995/1657-58), 126.

Pascal's wager makes sense once we account for all of these stipulations: (1) it involves a game we are playing; (2) that game has an outcome that remains uncertain; (3) because we are playing the game we can effect what the outcome will be; (4) the outcome is not available to us as a true or false statement; (5) we are, therefore, left with a probabilistic judgment to make; (6) based on the game, we will make that judgment one way or another. By situating it here, by making Pascal's wager a *probabilistic statement* through and through, we deviate from what is typically meant by probability, ranging beyond the parameters typically associated with it.

As a demonstration of probabilistic reasoning, Pascal's wager is not, then, a demonstration of statistical reasoning. Most notably, in this regard, Pascal's wager makes a probabilistic claim *using only words.*[44] To read Pascal's wager this way is to read it as an attempt at describing (and recommending) a *judgment* of probability oriented toward what Pascal describes as "general" (applicable to you, me, everyone) and as *constituted* by possibilities (rather than certain, fixed traits). With something like this the best we can do is make a probabilistic judgment, but something like the "law of large numbers" will not help us do that.[45]

The Probabilistic Style of Reasoning

How can probabilistic reasoning *not* be statistical? Such a question is already asked by data science. We ask the same question but answer it in a different, more Pascalian way. What this reading of Pascal's wager tries to draw out is a *style of reasoning* irreducible to statistical techniques and computation. The philosopher Ian Hacking (following the historian of science A.C. Crombie) defines "styles of reasoning" in science as "[settling] what it is to be objective."[46] A style "has become what we think of as a rather timeless canon of objectivity, a standard or model of what it is to be reasonable about this or that type of subject matter."[47] Most concretely, "each new style … brings with it new sentences, things that were quite literally never said before."[48]

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[44] Randall Collins, "Statistics versus Words," *Sociological Theory* 2 (1984): 329-362.

[45] Alain Desrosières, *The Politics of Large Numbers: A History of Statistical Reasoning* (Cambridge: Harvard University Press, 2002), 79-80.

[46] Ian Hacking, *Historical Ontology* (Cambridge: Harvard University Press, 2002), 181. A.C. Crombie, *Styles of*

Styles of reasoning are not limited to a specific empirical topic. They also are not dependent on any specific claim being valid or justified, nor do they rely on one method or one theoretical framework or paradigm. Hacking doesn't speculate, though some have, that styles of reasoning are the broadest, most inclusive ways of classifying knowledge: larger than disciplines, they are comparable to (and in Hacking's case, inspired by) Michel Foucault's "epistemes"; yet unlike those, different styles of reasoning can coexist in the same historical period, even within the same discipline. However, a given style is not limited to only one discipline.[49] Unlike a paradigm or theoretical framework, for example, our suggestion is that probabilism most resembles a style of reasoning. It has its own, distinctive form of objectivity (probability is objective), distinct "entities" (*Chance*, probabilistic orders, tests), and type of evidence (looping, expectations matching objective chances). A key bit of evidence for styles, according to Hacking, are sentences. Under the auspices of a style, sentences are composed that defy all other styles and, to readers, even comprehension. This is true of probabilism.[50] Probabilism is also

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Scientific Thinking in the European Tradition: The History of Argument and Explanation Especially in the Mathematical and Biomedical Sciences and Arts, Three Volumes (London: Duckworth, 1994); A.C. Crombie, "Commitments and Styles of European Scientific Thinking," *History of Science* 33, no. 2 (1995): 225-238.

[47] Hacking, *Historical Ontology*, 189.

[48] Ibid, 190.

[49] Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York: Vintage, 1971/1966). See also Martin Kusch, "Hacking's Historical Epistemology: A Critique of Styles of Reasoning," *Studies in History and Philosophy of Science Part A* 41, no. 2 (2010): 158-173; Rasmus Winther, "Interweaving Categories: Styles, Paradigms, and Models," *Studies in History and Philosophy of Science Part A* 43, no. 4 (2012): 628-639.

[50] As Hacking puts it, "The style of reasoning dictates constraints on the truth and establishment of the sentences that it defines. The actual truth of those sentences is external to the style: what is true in no way depends upon the style of reasoning. The truth does not depend upon how we think. But that a certain complex sentence is a candidate for the truth may depend upon there being a style of reasoning, because there is no truth-or-falsehood in the matter, independent of a style of reasoning … A style of reasoning, once in place, is not relative to anything. It does not determine the objective truth. It is the standard." Ian Hacking, "Statistical Language, Statistical Truth, and Statistical Reason: The Self-Authentication of a Style of Scientific Reasoning," *The Social Dimension of Science*, edited by Ernan McMullin (Notre Dame, IN: University of Notre Dame Press, 1992), 135. Consider, in this light, the following sentence from Max Weber, which (at least according to some) is practically "impenetrable": "Specifically, for us an action is 'adequately caused' when, according to the then-current *average* probable assessment of facts, the action is subjectively oriented in meaning toward those facts. Thereby the *objectively* calculable probabilities of the possible expectations also function as an adequate *cognitive* basis for the probable presence of those expectations in actors. That the terminology of the two converges almost unavoidably does not eliminate the logical chasm between them. Only in the first sense, by a judgment of objective possibility, we obviously mean that those objective probabilities (*Chancen*) are suited on the average to serve as meaningful grounds for the subjective expectations of the actors, *and therefore*, that they actually (in a relevant measure) did so serve." See Max

not limited to sociology or any other language game (we can find it in philosophy, physics, cognitive science, baseball). And neither is it limited to one method or data source (transcending qualitative and quantitative).

The key claim we want to advance is twofold: Hacking recognizes statistics as a unique style of reasoning, one based in the "analysis of regularities of populations and the calculus of probabilities."[51] He recounts its historical development, extending back to figures like Pascal. Yet, he conflates statistics and probabilism, and omits a key chapter in the history of probabilism when its statistical appropriation is brought into question. We focus on this omission in chapter 3, and what it shows is a historical continuity between Pascal and the present maintained by a roughly similar style of reasoning, which can be used *as* statistics but which historically precedes statistics and remains irreducible to it. This has significant bearing, we argue, on a field like sociology which, to use Hacking's concept, finds the truncated "statistical" style of reasoning all pervasive (even in qualitative analysis).

A probabilistic style of reasoning, wherever it is found, blurs the distinction of subjectivity and objectivity, and it does so based on a *loop*. The loop can be depicted with the following image:

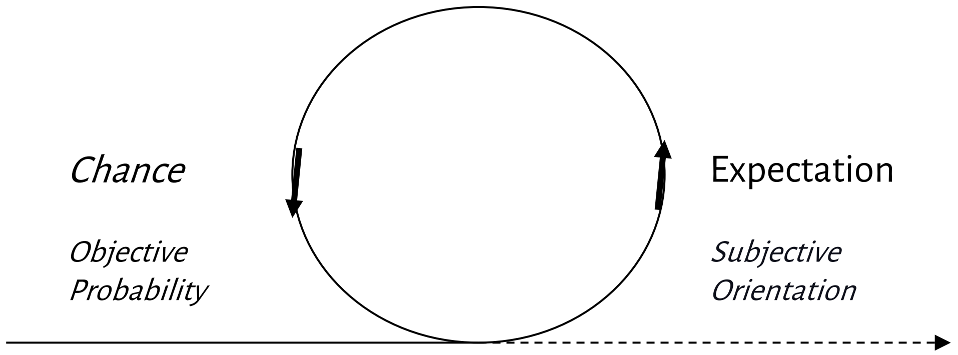

Figure 1: *Chance*/Expectation Loop

Figure 1 shows how objective probability exists, yet it could simply become a subjective orientation if it does not create expectation. If it does become an expectation, then objective probability becomes *Chance* (we follow the convention to capitalize and italicize to distinguish this

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Weber, "Some Categories of Interpretive Sociology," *Sociological Quarterly* 22, no. 2 (1981/1913): 151-180, quotation is on p. 161. See also Alan Sica, *Weber, Irrationality and Social Order* (Berkeley: University of California Press, 1988), 188.

[51] Hacking, "Statistical Language, Statistical Truth, and Statistical Reason," 132.

concept from “chance”) or potential, and we can observe a constructive *looping effect*: something actual can appear, which we can observe and even measure, calculating its effects. This is a *probabilistic order* with relatively uniform looping effects; we can even predict them. It remains threatened by dissolution back into subjective orientation, and thus turning into a subject/object relation, available to contradiction, alienation, otherness. A probabilistic explanation must account for what creates the objective probability, for *looping in* rather than dissolution into subjective orientation, and what maintains the connection of expectation and *Chance*.

The loop helps account for many things that remain distinctly probabilistic: a source of order that is real but unknowable, the construction of order not from chaos but from *Chance*, and the distinct boundaries and characteristics of probabilistic orders—what is capable of action, what counts as an adequate cause, and how the boundaries are maintained. The technical terms included here are not meant to refer to empirical things, but instead are tools for understanding what is capable of only an indirect observation. Objective probability can be measured statistically, but it does not actually exist in the form of statistics. It is only made actual in action and expectation, as a successful form of looping in. *Chance* appears in action and expectation: analysts can observe how individuals act in relation to potentials, statistical measures of it are possible, and if they are capable, actors can report on a probabilistic order, often with surprising lucidity. But we will not suddenly stumble upon one on a morning walk, though even such a walk is not as singular as we might believe (at the very least, we still loop into the state).

Looping orders can be attributed as much to “nature” as to “culture,” though with the caveat that in the case of the latter, those orders do not arise from chaos nor from law-like universal tendencies. They are also not efforts to bring orderliness to what remains entirely disordered, but are, instead, marked by attempts to loop into what might remain entirely indifferent to human interests. As we will explain, a main difference between varieties of probabilistic orders concerns what is capable of action, or what (or who) has the potentiality to act in such a way as to make possibilities actual. To make that claim, however, first requires some preparatory work to dig further into the basic mechanism at stake here—the loop—and how it can be constructive both of orders and of their analysis.

Aristotle and the Activity of Being

In his *Physics,* Aristotle offers a core insight for probabilism, claiming that whatever exists in the world does so on a vector running from *potentiality* to *actuality.*[52] In one sense, this is compatible with keeping both of these terms as epistemic categories: something is possible because we can *conceive* of it, something is actual because we have *measured* it. But then Aristotle adds another point, leading us beyond epistemology: "movement" or change involves "the actuality of potential as *such*."[53] Aristotle uses the example of bronze. By itself, bronze is a potential statue, just as much as marble or steel. Such a statement may appear strictly epistemic: we can *conceive* of bronze as a possible statue. The "actuality" of potentiality, however, refers to something quite different and unique; it applies as soon as we start *trying to change* bronze into a statue. In that movement, potentiality will exist fully *as* potential, according to Aristotle, independently of initial conditions (bronze, statue form, sculptural practice) or any future outcome (a bronze sculpture). This mode *of being* involves potentiality as it actively exists *sui generis*—and we emphasize *actively* here, as what applies in this modality applies only in action, that is, in the *making actual of possibilities*, as these arise from the underlying potential of the bronze.[54]

On these grounds, Aristotle proposes what seems like a novel "way of being."[55] Everything that now exists as actual (measurable, observable) must also be possible as reflective of the real potential of something, somewhere. Even further, it must also exist in a state of being *made* actual, which is to say, in change, movement, and *action.* Some Aristotle scholars refer to this as "the activity of being,"[56] and while objective probability falls outside the bounds of Aristotle's reasoning here, we find his classical framing helpful in zeroing in on what objective probability and *Chance* are, while avoiding a conflation with statistical measures.

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[52] Aristotle, *Physics,* translated by Edward Hussey (Oxford: Oxford University Press, 1993).

[53] Ibid, III.1.201a10. The full quotation is as follows: "There being a distinction, in respect of each kind [of being], between [being] actually and [being] potentially, the actuality of that which potentially is, *qua* such, is change. For example: the actuality of what admits of qualitative change, *qua* admitting of qualitative change, is qualitative change; of what admits of increase and decrease (there is no common term to cover both), it is increase and decrease; of what admits of coming-to-be and ceasing-to-be, it is coming-to-be and ceasing-to-be; of what admits of locomotion, it is locomotion. That this is change is clear from the following: when that which is buildable is in actuality, in the respect in which we call it such, it is being built, and this is the process of building; and similarly with learning and healing and rolling and jumping and maturing and growing old."

[54] The philosopher Mark Sinclair argues that some notable 20th century thinkers have reversed Aristotle's formulation and allowed possibility to take precedence over actuality. Martin Heidegger, in particular, reads "this definition of movement as announcing a mode of being where possibility or potentiality really shows itself and fully exists as the possibility that it is … possibility is not 'lower' but rather 'higher' than actuality." See Mark Sinclair, "Heidegger on 'Possibility,'" in *The Actual and the Possible: Modality and Metaphysics in Modern Philosophy*, edited by Mark Sinclair (Oxford: Oxford University Press, 2017), 8. As we will argue below, Heidegger uses the idea of *Spielraum* ("field" or "range" of possibility) to make this argument, which is most closely associated with Johannes von Kries (who was Weber's key influence). Heidegger was likely influenced, however, by Edmund Husserl, who also used the idea (arguably, through Kries' influence).

[55] See Charlotte Witt, *Ways of Being: Potentiality and Actuality in Aristotle's Metaphysics* (Ithaca, NY: Cornell University Press, 2003).

As we will argue, anything of sociological significance is probabilistic, but this is not, as the typical reasoning might go, because it involves the "statistical analysis of regularities in populations, and the calculus of probabilities."[57] It is probabilistic for reasons that reflect what Aristotle sketches here. Anything of sociological significance is probabilistic as the making actual of possibilities that emerge from objective potentials; but far from being unpatterned, possibilities are, in fact, objective *probabilities* that actors, who themselves are disposed in distinctive ways, *expect* and can predict. This means that certain possibilities are chronically *reproduced* and *repeated*, which makes them available for statistical measure. What is socially real remains unknowable except as what is capable of being measured but also looped into and made "actual" in action, which we can read from actors' expectations and predictions, in addition to their lines of action. As we argue below, these principles have application to anything (culture, morality, meaning) sociologists seek to identify *in action*. Whatever we take to be actual, which includes all that we measure, record, and observe in the social world, must be the product of action, which in the "actual, potential" dynamic means that it must also *exist* objectively as potential.[58]

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[56] The standard translation for Aristotle's terms *energeia* and *dunamis* are "actuality" and "potentiality," respectively. Yet, the late classicist Aryeh Kosman, more recently, argued for a different translation, with *energeia* as "activity" and *dunamis* as "ability or capacity." This puts the onus even more on "existing" (*ousia*) as a reference not to an entity but an activity (e.g., "the activity of being"). As Kosman puts it, "the making actual of possibility" makes sense as an English-language statement, but it at least partially "obscures what is fundamental in Aristotle," specifically that "the paradigmatic realization [of being] is the exercise of a capacity." We agree with Kosman's arguments, though to avoid the grammatical challenges of trading "energy" for actuality, and "capacity" for potential, we retain the standard terminology but with the caveat that in its capacity to produce existence, looping in *is* the "activity of being." See Aryeh Kosman, *The Activity of Being: An Essay on Aristotle's Ontology* (Cambridge: Harvard University Press, 2013), viii.

[57] Ian Hacking, "Statistical Language, Statistical Truth and Statistical Reason: The Self-Authentication of a Style of Scientific Reasoning," in *The Social Dimensions of Science*, edited by Ernan McMullin (South Bend, IN: University of Notre Dame Press, 1992), 130-57. As we argue in chapter 3, Hacking historically conflates probabilism with the statistical style.

[58] This is particularly true of Pierre Bourdieu, who across all of this theoretical works (*Outline of a Theory of Practice, Logic of Practice, Pascalian Meditations*) makes frequent mention of an "actual, potential" dynamic, suggesting a duality or "double aspect" of symbolic fields (actual) and probabilistic order (potential) regardless of the "arbitrary" content so ordered. Weber also emphasizes an "actual, potential" dynamic and links this specifically to social action in his fragment on "The Market." See *Economy and Society: Volume 1,* edited by Guenther Roth and Claus Wittich (Berkeley: University of

In this philosophical format, probabilism is still stated all too abstractly. At the very least, Aristotle provides some terminology and concepts for thinking probabilistically in the absence of statistics. The difference between probabilism and statistics, and what is lost when we conflate the two, can be further observed and previewed by comparing their two different treatments of the common phrase: “it happened by chance.”

Does it Happen by Chance?

For a statistical style, “it happened by chance” means that it, whatever “it” is, happened beyond the limits of our knowledge. Thus, when 90% of the variance is left as random error, “chance” gains its definition purely according to the model that we can claim to know. This presumes that knowledge is the antithesis to chance; we create knowledge when we have *tamed* chance and removed its curse from what we can now trust as stable and predictable. Conversely, chance is equated with that which cannot be known; randomness. The task is therefore epistemic. to eliminate chance enough, by replacing it with chance-less knowledge. We expand our knowledge with a model that can mirror reality because the model is chance-less.

For a probabilistic style, “it happened by chance” tells us about the world itself, specifically about the ways in which what is actual doubles as a potential way of being. Chance applies to the middle domain, the modality of this change; yet it defies expectations about what *should* run between potentiality and actuality. In this sense, chance is opposed to probability, but only relatively: only in relation to what we expect to happen based on how we have, thus far, made the actual from the potential.

If, for example, we simply “add water” to bronze alloy and it suddenly assumes the form of Rodin’s *The Thinker*, this would defy expectations of what typically changes the alloy into something like *The Thinker.* We would say it happens by chance, that *chance* is its cause instead of something we recognize. These typical factors (e.g., sculptural practice, statue form, aesthetic meaning) “exist” as immanent to the action; they have powers *for* or *in* action by engaging “potentiality *as* potentiality” in Aristotle’s words. Action loops into an order in which, in action, these factors can have the predictable outcome of making a bronze statue. A chance does not exist in the same sense, at least not until it

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California Press, 1978), 635ff.

appears in action. When chance invites itself in, something unexpected happens and something new appears to exist: a *chance mechanism* not perceived before. We are led to consider a range of possibility far wider than before. If we are creative, different actions *will* now become adequate to the task; we will change how we make statues from bronze.

Thus, an epistemic approach to probability requires datafication and method: "chance" is effectively *anti*-knowledge. For the ontological approach, on the contrary, probability *exists* outside a unit of measurement: "chance" appears in contrast to action that typically makes actual certain potentialities. We can enhance its presence (*invite* it in) by relaxing our concern with what we expect are adequate causes of what is actual and present to us.[59] This is what happens in a game of chance, for instance, that focuses only on the minimum of rules in the production of outcomes (we explore this further below), making actual an almost entirely random result. Potentiality as a "way of being" is therefore shaped by causes either forbidden from mattering or over which we relinquish control. In this modality, then, we can also *tame* chance by changing our actions and expectations, specifically to *expect* and *predict* what once "happened by chance."

We can illustrate this point, and the subtle epistemological/ontological difference at play, by drawing an example from a field that has been thoroughly renovated by data science: the sport of *baseball*.[60] Suppose a baseball player hits an inside-the-park home run. This is such a rare event in the sport that when it happens, it is common for observers to say that it happened "by chance."[61] How is this not simply an epistemic statement? Given the general rules of baseball, an inside-the-park homerun falls within the range of possibility that constitutes "baseball." It can *potentially* happen; though, it is not *probable,* at least not as the game is typically played. For those who had never seen a baseball game before, an inside-the-park homerun would not seem unusual. They would not know this particular play as highly improbable and would take no particular note of it. Those with moderate experience of baseball, however, involved more extensively with its range of possibility, could make that judgment, and the more experience they have the more confidence they would have in making it. Statistics about inside-the-park homeruns would back them up, although they do not need those statistics to judge the event as improbable.

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[59] A surprising point of ignorance that infinite data could not solve is simply that we do not know "where the chances are" even though so much of our knowledge is rooted in a data-driven version of probabilism. Chances can "appear out of nowhere" even when *we* invite them in, as with a coin flip. But where in a coin flip do the chances *exist*? We will not let chances like these into just anything. Low stakes situations (e.g., who will have the ball first in a game) where anything except an invitation of chance seems unwarranted or unnecessary for absorbing uncertainty frame the limits of chance's pure application. It does not make good sense to use chance to decide the end of a hard fought game while uncertainty still looms over who will win. Wherever chance is located, it should not absorb *this* uncertainty. Factors (adequate causes) singled out specifically because they *cannot* be left to chance (like skill, effort, talent) should decide the outcome instead. See Katrina Elliott, "Where are the Chances?" *Synthese* 199 (2021): 6761–6783. For the tortured history of coin flips in sports, see Robert Weintraub, "Flipping Awesome," *Salon* (24 Nov 2010).

[60] Already heavily statistical, baseball has been a herald for the data revolution, an early adopter. From the perspective of roughly 20 years since this started, the game now features entirely new statistical categories measuring performance (Wins Above Replacement or WAR), new data-gathering technologies (StatCast) and new data-oriented "baseball jobs," most of which are staffed by people who never played the game at a high level (Analytics Director). Baseball also remains at the forefront of sports gambling, likely even more so in the near future, with the advent of many new "public records" to record and consult. The advent of the StatCast data-gathering technology by Major League Baseball in the mid-2010s has had the effect of changing what it means to be an effective pitcher, fielder and hitter, with new metrics like spin rate, range factor, and exit velocity. These are not just different from older metrics (earned run average, fielding percentage, batting average); they essentially redefine what it means to be good at pitching, fielding, and hitting in baseball. As the data appears to indicate that a certain type of baseball player (e.g. hits home runs, strikes out a lot, high range factor in the field) will be more effective than others, so those players typically become the players at the highest

But if we put this chance occurrence into action, we can notice the subtle difference at play between epistemics and ontics. Those *playing* baseball do not typically plan for an inside-the-park homerun to win the game. It does not count for them as an adequate cause for making a potential win an *actual* win, unlike a lot of strikeouts or regular homeruns. And yet, if they did play *expecting* an inside-the-park homerun, if this was an adequate cause called upon to win the game, they would change the game. Through their action, they would make this seemingly chance event objectively probable.

This is not as far-fetched as it might sound. Many things that *were* believed to be adequate causes for winning baseball games have changed in conjunction with baseball's adoption of predictive analytics.[62] A contact hitter who does not strikeout is not, generally, adequate in the game today, while a homerun hitter who overall bats around the "Mendoza line" (.200 batting average) *is* adequate. What once seemed to happen by chance (e.g. a home run hitter batting at a .200 average winning the team a lot of games) has now been brought into the fold and is predicted to win games. Yet supplying predictive analytics of this sort does not ultimately change the game. Changing *expectations*—that is,

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levels of the sport when formerly they may not have been. If the data says making a certain decision in a certain situation during a game will make the most contribution to winning the game, increasingly those decisions will be made, and more data will be gathered on those decisions being made. Thus, "continuous data gathering in a universe made by past decisions" changes the game. We should expect any "data revolution" (in any field) on the scale promised by data science to do the same. See Phillips, *Scouting and Scoring*, 132; Michael Lewis, *Moneyball: The Art of Winning an Unfair Game* (New York: Norton, 2003). Ben Lindbergh and Travis Sawchik, *The MVP Machine: How Baseball's Nonconformists Are Using Data to Build Better Players* (New York: Basic Books, 2020).

[61] Ken Ross, *A Mathematician at the Ballpark: Odds and Probabilities for Baseball Fans* (New York: Penguin, 2007).

[62] Phillips, *Scouting and Scoring*.

changing what is judged as a potential to win the game and what, therefore, exists in action—is what changes the game.

Varieties of Probabilistic Order

For the probabilistic style of reasoning, then, *probabilities are objective*; they are objective, because we *expect* them. In principle, we could voluntarily "expect" anything (e.g., that the sun will collide with the moon five minutes from now). Yet, such *possibilia* are merely epistemic in form: a guess about some conceivable state of the world. In practice, maintaining that expectation will prove difficult (it should likely lead us to set about warning people of an upcoming disaster, leading them to question our sanity), given that it has been tested only by us (according to our inward orientation) instead of anything existing in the world. In circumstances where objective probability is relatively absent, expectations can be more voluntary; they can be rooted more in knowledge claims or in the interpretations made available by worldviews (not unlike Pascal's wager). We can see this either as a reflection on limited experience, or because whatever we are trying to loop into has little or no history: it can be remade simply by our involvement. In that case, its construction is more dependent on *us* and our willingness serves as a more important factor in giving our expectation duration and longevity. Yet, the comparative rarity of such voluntarism would suggest that while we *must* loop in, what we loop *into* more commonly remains beyond our control.

What we are speaking of here are varieties of *probabilistic orders*, or domains of objective probability, where only some things are causal, some things are capable of action, and in which we can find limitations in the range of possibility. Statistical reasoning cannot actually tell us what is objective about these orders. We can record and measure their actualities, but we should not mistake these calculations for a description of their reality. Rather, what constitutes probabilistic orders are factors that construct the range of possibility, those that forbid some causes while allowing for others, and which create a circumstance where action (by something) makes actual what would, otherwise, remain only possible. Certain orders—particularly those called "fields"—include us and our expectations, our orientation toward objective probability. In such cases, we play a part in constructing the order, but this is not always the case. Thus, a probabilistic order in which human action creates measurable (statistically, data-scientific or otherwise) actualities is different from an order in which the action of something else does.[63]

The key sources of variation between probabilistic orders include history, how the probabilistic order appeared in time, and how it has duration. Additionally, how is action enrolled in the order; how does action maintain it? This allows us to identify what *exists* in the order and what *causes* things to happen. Probabilism denies any firm allegiance to either "mind-dependence" or "mind-independence," as it includes *both* a mind-to-world fit and a world-to-mind fit.[64] Some orders will remain completely impervious to ("independent" of) our expectations; others will seem to disappear as soon as our expectations cease. Max Weber's favorite example of the latter was the card game.[65] Solar storms, by contrast, or mass ejections of particles from the Sun that batter the Earth's magnetosphere, are completely independent of what we expect: not expecting them will not prevent them from happening. These storms will hit the Earth again, just as they have in the past; this is, unfortunately, *inevitable*.[66] The same would apply for some yet unseen terrestrial (or extraterrestrial) menace that we have no knowledge of.

Yet inevitability is merely an epistemic statement; it does not mean that solar storms are objectively probable in the sense we have given that phrase. Solar storms are inevitable to us because while we know they are possible, they become actual not through any action that we are capable of (our action is not an adequate cause of these storms). Most people do not seem to act in ways that would tell us that they are expecting these storms. The encouragement of some, that we *can* orient toward these storms, that we can come to *expect* them, comes by way of suggestion: we can control how they are actual, and presumably less catastrophically destructive, *for us* if we make the right preparations.[67]

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[63] For instance, the potentiality of fatigue becomes the actuality of fatigue via action. Human action (staying awake for 24 straight hours) is still "chance" relative to a more adequate action happening somewhere else. The same could be said for death or rainfall. Max Weber would refer to these as "events lack[ing] meaning" but which were still causal. Weber, *Economy and Society: A New Translation*, 88.

[64] John Searle, *The Construction of Social Reality* (New York: The Free Press, 1995).

[65] According to Weber, as soon as someone "consciously and deliberately departs from the rules of the game," the card game ceases to be, and we are no longer involved in its probabilistic order. This might allow a player to cheat before others notice it; regardless, we move behind the game's range of possibility and what it allows to be an adequate cause. Weber, "Some Categories of Interpretive Sociology," 11-12.

[66] It is important to emphasize that solar storms are mere actualities that we can measure and observe, but that this will tell us nothing about their probabilistic origin. This origin—"the Sun's magnetic field [that] stretches out through the solar atmosphere and into deep space"—includes action as mediator between the actualities of these storms and their potential. Thus, beyond recording the incidence of storms and doing calculations to produce a statistical chance that they will happen this year or the next, we can know solar storms as probabilistic differently—a possibility of the Sun as a probabilistic order. Among other things this allows us to be certain we are counting the same actual events as "solar storms." Stephen Battersby, "What are the Chances of a Hazardous Solar Superflare?" *Proceedings of the National Academy of Sciences* 116, no. 47 (2019): 23368-23370.

Regardless of whether the probabilistic order in question has inevitable consequences, then, the same rules apply: expectations matter, action makes possibilities from within a range of actual probabilities, and not everything can be casual within boundaries of a probabilistic order (even if it can be causal outside of it).[68] For a probabilist, the best statistics can do is allow us to make secondary inferences about these probabilistic schemes and how they might be working in a given order. Symmetry aside, it also matters that a probabilistic order has a human history. Yet this should not lead us to assume that humanly constructed probabilistic orders are easy to change, or that they are as apparently transient as a card game. What matters most for any probabilistic order is what makes it actual and whether (or how) we *loop in*. As we explain below, a key distinction between different approaches in sociology involves the first, while the second is arguably what makes probabilistic reasoning most distinctive. Let us now focus on the loop specifically.

Using Cognition to Theorize Loops

For a probabilist, an expectation is akin to a *guess* or, more kinetically, a *grabbing* at something which is independent of us, with its own potential. We become outwardly oriented, open to the world.[69] if we are oriented to making a bronze statue, then the history of statue-making, and more specifically statue-making as an artistic field, becomes quite objective to us. We cannot help but form expectations relative to that field and grab at its possibilities as we make the many decisions that go into our craft. We can expect how others will respond to our statue based on our judgment of what that history makes probable; at the very least, this means we can expect others will see our statue as a

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[67] Mike Hapgood, "Prepare for the Coming Space Weather Storm," *Nature* 484 (2012): 311-313.

[68] The arguments presented here mirror those put forward by Charles Sanders Peirce, another among the ranks of probabilistic thinkers and whose work we consider in depth below. Peirce's comparable idea to probabilistic order is "generalizing tendency" for which he recommended a logic of continuism. As we highlight in later chapters, much of this thinking finds its way into contemporary pragmatism, though some of it does not. See also Paul Forster, *Peirce and the Threat of Nominalism* (Cambridge: Cambridge University Press, 2011).

[69] We have theorized this elsewhere using the concepts of "belief as embodied action" and "hysteresis." See Michael Strand and Omar Lizardo, "Beyond World Images: Belief as Embodied Action in the World," *Sociological Theory* 33, no. 1 (2015): 44-70; Michael Strand and Omar Lizardo, "The Hysteresis Effect: Theorizing Mismatch in Action," *Journal for the Theory of Social Behaviour* 47, no. 2 (2017): 164-194.

"statue," which we made by passing the tests of the field, which all would-be statues must pass. Should the history of statue-making play no role in our action, then its probabilities would not be objective. In this case, we might claim that what we have made is a "statue," though from the perspective of the field it looks more like a melted candle.

We will refer to this process throughout the book as *looping in*, and it takes the form of subjective expectation (guessing, "grabbing," anticipating) that emerges via passage through a source of objective probability. That source is substantively neutral; it can assume a whole variety of specific forms (e.g., a rule, a conception of order, a social field, a relationship history). What they all do is the same: they dictate the range of potentiality, what is capable of action, and what can and cannot be an adequate cause. Regardless of what we substantively loop into, then, it will allow our action to mediate between potentiality and actuality. We do this by making probabilistic judgments: a guessing at the future not as an attempt at truth or the assertion of value, but to orient toward what is objective. Importantly, in this process, we can be *surprised*: our guesses can go wrong, our grabs might find only thin air. As we expand upon below, the experience of "surprise," which is not always conscious or reflexive, is integral for probabilistic reasoning, as it can lead us toward knowledge of what we either (reflexively) loop into or what it is that whoever (or whatever) we are *observing* loops into.

Stated as a definition, the loop is a two-part relation that remains in constant cycle: one part is nothing without the other, though both are "uncertain" for the other. Thus, the two parts do not fit as "subject" and "object" as much as *a parte objecti* and *a parte subjecti*. As *a parte subjecti* (whatever form it takes) loops into *a parte objecti*, it produces existence (observable, measurable).[70] These two refer simply to positions in the looping relation: that which guesses and that what is guessed. As we will see, a looping relation can remain perfectly continuous between nature and culture. When *we* loop in, however, this becomes specifically apparent as cognition and perception, points highlighted by the "predictive processing" framework in cognitive science as a key demonstration of probabilistic reasoning.[71] Here, briefly, we can pull out the relevant details, as they help to specify the nature of the probabilistic loop.

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[70] Pierre Bourdieu, *Pascalian Meditations* (Stanford: Stanford University Press, 2000), 235.

[71] For introductory discussions of predictive processing, see Andy Clark, "Expecting the World: Perception, Prediction and the Origins of Human Knowledge," *Journal of Philosophy* 110, no. 9 (2013): 469-496; Daniel Williams, "Predictive Processing and the Representation Wars," *Mind and Machines* 28 (2018): 141-172; Wanja Wiese and Thomas Metzinger, "Vanilla PP for Philosophers: A Primer on Predictive Processing," in *Philosophy and Predictive Processing*, edited by Thomas Metzinger and Wanja Weise (Frankfurt am Main: MIND Groups, 2017); Daniel Hutto, "Getting into Predictive Processing's Great Guessing Game: Bootstrap Heaven or Hell," *Synthese* 195, no. 6 (2018): 2445-2458; Jakob

Fundamentally, cognition is an engagement with a probabilistic environment of tendencies, potentials, and ranges of possibility. Predictive processing can resemble a form of rationalism, in this sense, but adapted to such an environment that, in its appearance, is objective probable. Thus, we only know, with varying confidence, what we can *expect* or in the preferred terminology *predict* (just as we can only know or find meaningful our own ideas or our own categories); but what we know is less like stable knowledge and more like a continuous *learning*. Expectations are not subjective constructions, but neither are they mirrors of an objective reality. In line with probabilistic reasoning more generally, predictive processing makes them closer to successful attempts at *looping in* to bring perception and action into line with a real but essentially unknowable outside world.

The reasoning behind this is fully probabilistic, and the conceptual "picture" that informs predictive processing is one conducive to a *parte subjecti* and *parte objecti* kind of theoretical logic: the brain is gray matter locked away inside a thick layer of protective bone (e.g., the skull) with no direct way of accessing the outside world directly. What brains do have at their disposal are the senses, and the capacity to retain and predict the information the senses retrieve via direct contact with the world. Predictive processing says, in essence, that brains can engage with an uncertain environment only by building the equivalent of a *model* of the causes of its own sensory stimulation that can constantly generate predictions (guesses), putting incoming sensory information into an order that works by reducing "surprisal" (also a term of art). Perception, then, and all sense engagement searches out and homes in on "deep regularities" or durable associations within sense information that might otherwise seem chaotic on the surface. The model, then, really performs as a guess or judgment (is this object a chair or a box?), allowing for tests of and interventions into the world (what if I sit on it?). If the guesses are right (it seems to be a box, but I can use it as a chair), then the prediction *loops in*, and the model is affirmed.

The model, in this case, is the capacity to make *actual* what it guesses is *possible* because it *really is* possible. Thus, there is an inverse relation between looping in and perception. We perceive less when we loop in: when we intervene, we are not surprised; we do not nor do we have to puzzle out what we are perceiving. The same is not true when we guess what is *not* there and the loop *breaks*. A

Hohwy, *The Predictive Mind* (Oxford: Oxford University Press, 2013).

model can be the capacity for representation in cases where we cannot find the possibilities to make actual and are thus drawn to act more on a "conception" of order, finding similarities and analogies through mediation, rather than by sense-modeling. In cases of loop breakage, we become information hungry, with a searching disposition, taking perceptions in from all sides. To loop in again, we must either change our model or change the world to fit our model.

A probabilistic environment, much as Aristotle intuited, revolves around an actual/possible vector for which *not* all that is possible becomes actual (or measurable, observable), nevertheless it remains consequential. Such an environment allows for action; it is also speculated that only such an environment could allow for the evolution of cognition on any scale.[72] If cognition can rarely qualify as the pure "representation" necessary to avoid sheer meaninglessness, then the world is not generally a chaotic and an unreliable *parte objecti* that must be constructed by us in ways other than through *loops*. A fully determined, "clockwork" universe, meanwhile, would make action unnecessary, as everything possible will eventually become actual regardless of action. Predictive processing, by contrast, not only puts the onus on an "enactive" approach that cannot easily align with either chaos or determinism, it also argues for an "extended" and embedded process, with cognition as the constant, future-oriented but past-deriving, best guesses that loop into a world comprised of tendencies and potentials, rather than pure contingencies or pure necessities.[73] At the meeting point of *a parte subjecti* (cognitive models) and *a parte objecti* (probabilistic environments) is where we will find *Chance* as Max Weber called it.

The discussion here, albeit brief, condensed, and abstract, sketches a groundwork of sorts for the revisionist view of sociology that is to come, which questions its incorporation of probability as statistics, the prevailing use and understanding of interpretation, and its explanation of action. As we will show, the study of probabilistic orders is obscured by a history that has rigidly separated probability from interpretation. The task at hand, then, must be to break with inherited views that make probability and interpretation mix about as well as oil and water, an effort that, as we will now discuss, data science also makes in its departure from the weak probabilism of statistical reasoning.

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[72] See Thomas Parr, Giovanni Pezzulo and Karl Friston, *Active Inference: The Free Energy Principle in Mind, Brain, and Behavior* (Cambridge: MIT Press, 2022).

[73] For a general development of a dispositional ontology of tendencies consistent with probabilism, see Rani Lill Anjum and Stephen Mumford. *What Tends to Be: The Philosophy of Dispositional Modality* (New York: Routledge, 2018).

Where Is Probability?

We have argued that, at its core, the probabilistic style of reasoning proposes a very different approach to probability than the statistical style. This is in part because it unbinds probability from the (19th century) tethers that have kept it only epistemic. Such an approach forbids probability from being engaged with as *sui generis*, as it simply adopts probability to the purposes of statistical analysis. To break that link, as we will seek to do in a variety of ways in this book, is to reason probabilistically by considering probabilities beyond their epistemic usage. More simply, this allows probability to exist independently of statistical models. Thus, to break with statistics would also break with the nominalism that is often corollary to statistical assumptions, by moving from what is measured, and thereafter made substantial (often as a "state category"), into ranges of possibility from which these observables are derived but which are not substantial in the same sense.[74]

Among other things, this would mean (paradoxically) that possibilities and potentials are more *real* than the stabilized formations (e.g., groups and structures) that statistical reasoning can lead us to assume populate the world. To break with the statistical style is to break the current methodological monopoly over probability. By making probability constitutive of what is in the world, this presumes its learnability via means besides frequency counts and calculations, and thus opposed to the limited use of probabilities as measures of what is presumptively substantial about the world. In short, probabilism pursues a project directly opposed to the statistical project, taking nominalistic entities and reconstructing them as probabilistic.

We advocate taking up that pursuit, but we are not alone. Data science, as we have alluded to, attempts a similar kind of break with substantialist assumptions in statistics as while it still uses probability to tame (epistemic) chance, it arrives at a kind of probabilistic reasoning through a not dissimilar trading of substances for ranges. Freed from simply talking about means and standard deviations, so-called "big ass data" proposes to dissect substantial "things" (cities, markets, sports) into a "topology of surfaces or effects," which are offered up for consultation independent of specific questions or even a defining "population."[75] The task is more like *cartography* than correlation finding;[76] the data science "map allows us to scan our eyes up, down, left, and right, to draw both horizontal and vertical comparisons—how people in the population relate to each other in terms of demographics or any single surface," whether that surface be a political affiliation, a job in finance, or proneness to chocolate cupcakes—whatever we have a data "surfeit" *for*. This does not ask us to reduce variance through model-building or follow the logic of independent and dependent variables. The task is more to find and analyze a "social logic of distribution," or how a space of effects is arranged as probabilities.

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[74] For a similar criticism that moves in a probabilistic direction by barring the association of inequality with substantial groups, see Ellis Monk, "Inequality without Groups: Contemporary Theories of Categories, Intersectional Typicality, and the Disaggregation of Difference," *Sociological Theory* 40, no. 1 (2022): 3-27. For a critique of the role of state categories in sociological research, see Luc Boltanski, *Mysteries and Conspiracies: Detective Stories, Spy Novels and the Making of Modern Societies* (London: Polity, 2014), chap. 6.

We emphasize this approach to data science specifically because it highlights its break with statistical reasoning, helping us articulate a point of departure between probabilism of this sort, probabilistic reasoning and statistical reasoning on a key question: *Where is probability*? To "learn from data," as data science proposes, can be understood as tantamount to finding probabilities in what is a data proxy of the world, e.g., treating *the world as the model itself*.[77] "Supervised" machine learning, for instance, uses a datafied proxy of the world as a model to train an algorithm capable of linking data points without the tools otherwise needed by conventional statistics.[78] In this sense, data can be used to *break* with the assumption that we can only find probabilities in a *model* that we make to fit a particular data set, but to explain them, we must leave probability behind. Yet data science breaks with weak probabilism by going *almost* fully objectivist: if we do not need to "return" to the world to explain the probabilities we find in the model, then the world simply *is* the data we can gather about it; our (small) intervention is to train machines to learn about it (because we surely can't!). This would still not help us understand objective probability, however, to accomplish that, *we* must *do* something rather than simply make the technology that, surpassing our own limited biological algorithms, can sufficiently record and learn. Any version of weak probabilism would suggest the same, for there cannot be an object except in relation to a subject: probabilities do not teach us anything on their own, which is why we must translate them into terms that we can understand. We only give up that relation if we are willing to go *full* objectivist and (presumably) allow the "world as a model" to create the learners for itself.[79]

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[75] Monica Lee and John Levi Martin, "Surfeit and Surface," *Big Data & Society* 2, no. 2 (2015).

[76] On this score, see Dustin S. Stoltz and Marshall A. Taylor, "Cultural cartography with word embeddings." *Poetics* 88 (2021): 101567.

[77] We draw this phrase from the philosopher Hubert Dreyfus with a certain irony, as Dreyfus used it to refute the idea that artificial intelligence can be comparable to human intelligence. Only human intelligence can, Dreyfus argues, treat the world "as the model itself." All of this was articulated well before the technology that, presumptively, can and does create data proxies of "worlds" that can then be used as models to teach and train algorithms. Like Dreyfus, the world as the model itself is a statement on *learning*. Another significant association is between Dreyfus and Heidegger, who (especially the *dasein* notion from the latter's *Being and Time*) is Dreyfus' key influence in making this claim. Heidegger, however, seems to have been influenced by a key probabilistic thinker in his conception of worlds as *Spielraum*, namely Johannes von Kries, whose probabilistic approach is the subject of chapter 3. Thus, to treat the world as the model of itself would, in this sense, mean to find probabilities in the world via grounding in embodied action, still impervious to datafication; though as we explain below, loops can be technically engineered and do replace human-derived loops. See Hubert Dreyfus, *What Computers Can't Do: A Critique of Artificial Reason* (Cambridge: MIT Press, 1972), 177-78. For a consideration of Dreyfus' claims in line with data science, see Ragnar Fjelland, "Why General Artificial Intelligence Will Not Be Realized," *Nature: Humanities and Social Sciences Communications* 7 (2020): 10.

[78] Consider the problem of how to efficiently allocate a limited number of health inspectors in a city with thousands of restaurants: "The decision problem … would fall squarely in the prediction domain if the following simplifying assumptions were true: (i) The behavior of the individual establishments being inspected is fixed; and (ii) when problems are identified, they can be immediately fixed at a low cost that does not vary across units. Knowing which establishments are more likely to have violations would be equivalent to knowing which ones should be inspected. However, a more realistic setting incorporates heterogeneity across units: A building may be at higher risk of fire due to old wiring, but other considerations make it difficult to replace the wiring. Other units may have lower predicted risk, but it may be easy and

Now consider the following break from both sides: probabilities do not exist *as* the world, as data science contends, neither do they exist in models, as statistical reasoning argues; they exist only in a state of *action*. This is what probabilistic reasoning contends. The philosopher Maurice Merleau-Ponty, for one, made a similar proposal of probability-in-action as the only defensible way to think of probabilities. He recommended finding "a phenomenological basis for statistical thought." By itself, statistical thought "belongs necessarily to a being which is fixed, situated and surrounded by things in the world."[80] And yet, probability "does not concern any particular thing actually existing, any moment of time, any concrete event … it is not an ingredient of the world." If we attach probabilities to substantial things, then we are getting the relation exactly backwards, for we do *meet* probability, Merleau-Ponty contends; we encounter it all the time "in the perceived world."[81]

For statistical reasoning, the departure Merleau-Ponty attempts is quite significant indeed

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inexpensive to make substantial improvements. Another consideration is responsiveness; if violations entail fines, some firms may be more sensitive to the prospect of fines than others." The probability of a fire or an e coli outbreak is not an estimate based on a parametric model. The "more realistic setting" means effectively using the world itself as the model, with the algorithm being a decision tree for the allocation. Causal inference, for which the "analyst makes assumptions beyond those required for prediction methods," is not necessary. See Susan Athey, "Beyond Prediction: Using Big Data For Policy Problems," *Science* 355 (2017): 483-485, quotation is on p. 484.

[79] This is, more or less, the thesis of Philip K. Dick's *The Minority Report* (New York: Orion Books/Gollancz, 1956).

[80] Maurice Merleau-Ponty, *Phenomenology of Perception* (London: Routledge, 2005/1945), 513-14.

[81] Ibid, 513.

because it makes action far from an afterthought. For the purposes of statistical reasoning, action supplies data as the numerical record of how frequently something happens (e.g., police brutality, divorce, childbirth, for example), and so we might consider data points as "actions" if we like, but this really makes no difference. For all essential purposes, action requires us to espouse no more than what folk psychology (belief/desire talk) provides.[82] Data science, meanwhile, can in principle dissect action into data vectors, which might allow for a probabilistic theory of action.[83] Yet serious consideration of action remains subsidiary to data, for reasons not the least of which is the denial of actors any knowledge of probability.

It is no mystery why data science does not consider action, nor why statistical reasoning would not consider action probabilistic or expect to find probability *in* action. In large part, this arises from the recent genealogy of the theory of action in the social sciences. Talcott Parsons and Edward Shils, in their effort at a defining statement, allow for "orientation" in action, but toward definable "objects" (both social and nonsocial).[84] Nothing apparently made these points of orientation of varying probability. The cultural turn, meanwhile, makes action the site of subjective meaning, and this allows for a relentless focus on action.[85] However, the effect has been to further withdraw probability from action with the assumption that the basis of the order sociologists, in particular, seek to understand is one of fundamental chaos in which we can find meaningful order only through the "contingencies of interpretation."[86]

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[82] Duncan Watts, "Common Sense and Sociological Explanations," *American Journal of Sociology* 120, no. 2 (2014): 313-351.

[83] For example, high-speed cameras like Edgertronic and radar and optical tracking machines like Rapsodo have effectively allowed baseball "actions" to be turned into a series of "biomechanical points." Lindbergh and Sawchik, *The MVP Machine,* 105ff.

[84] At the very least, however, Parsons and Shils include an extensive account of "orientation" (and "learning") which seems to have been subsequently lost from the theory of action. "A specific combination of selections relative to … objects, made from among the possibilities of selection which were available in a specific situation, constitutes an orientation of action for a particular actor." Talcott Parsons and Edward Shils, *Toward a General Theory of Action* (Cambridge: Harvard University Press, 1951), quotation is on p. 5.

[85] See Isaac Ariail Reed. "Deep Culture in Action: Resignification, Synecdoche, and Metanarrative In The Moral Panic of the Salem Witch Trials." *Theory and Society* 44, no. 1 (2015): 65-94; Isaac Ariail Reed and Michael Weinman. "Agency, power, modernity: A manifesto for social theory." *European Journal of Cultural and Political Sociology* 6, no. 1 (2019): 6-50.

[86] Clifford Geertz gives the strongest articulation of this perspective: "Undirected by culture patterns—organized systems of significant symbols—man's behavior would be virtually ungovernable, a mere chaos of pointless acts and exploding emotions, his experience virtually shapeless. Culture, the accumulated totality of such patterns, is not just an ornament of human existence but the principal basis of its specificity—an essential condition for it. … There are at least three points where chaos—tumult of events which lack not just interpretations but *interpretability*—threatens to break in

This severance of probability from interpretation means that, rather than looping in, interpretation unilaterally constructs; to explain order, then, we must interpret the meaningful "content" of action. As we have suggested, by contrast, objective probability is not actual, though it can be measured. It is real as *potentiality,* but only in a judgment does it become possible or probable. Thus, it remains essentially unknowable, though we do know it cannot be sourced in meaningless chaos, otherwise there could be no judgment. This achieves distance from persistent assumptions by statistical reasoners, and by data scientists that data alone is actual rather than being an indicator of actions that make what is observable in the first place. From the side of action, it breaks the strict association between action and cultural meaning, which unnecessarily centers interpretation as the necessary condition for order and patterns, proposing that the alternative is meaningless chaos. For some probabilistic orders this does apply: to link initial conditions to outcomes in a way that can support probability (as both expectation and measurable chance), interpretation must resolve what is otherwise an extreme sensitivity to small changes in those initial conditions, or what is a probabilistic understanding of the concept of chaos. Holding everything else constant, a "contingent" alteration in meaning or signification, with no alternate means of forming expectations or filling in the blank on a partial sign, can warp the entire arrangement.[87] But this is of consequence, in a probabilistic sense, largely because a chaotic order will systematically forbid probabilistic expectations from forming, such that we can make no anticipations, or guesses, or practically develop in a way that can routinely perceive the intervention of chance mechanisms.

To help envision a different model of action *plus* rather than minus probability, we find it

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upon man: at the limits of his analytic capacities, at the limits of his powers of endurance, and at the limits of his moral insight. Bafflement, suffering, and a sense of intractable ethical paradox are all, if they become intense enough or are sustained long enough, radical challenges to the proposition that life is comprehensible and that we can, by taking thought, orient ourselves effectively within it." Peter Beger and Thomas Luckmann offer a related perspective in their influential argument for social construction: "the institutional order … is continually threatened by the presence of realities that are meaningless in its terms … the institutional order is…faced with the ongoing necessity of keeping chaos at bay" (*The Social Construction of Reality* [1966], 51). While Geertz, at least, roots his perspective in Weber, the premise that "meaning" (or "typification" for Berger and Luckmann) has this seemingly infinite range of possibility is not Weberian, at least not in a probabilistic sense. We certainly might expect that situations of "chaos" would feature the objective probability of meaning, though the reasons Geertz gives for this largely miss the mark. Without accounting for the construction of this *Chance*, such an expectation might *only* be Geertz's expectation. Clifford Geertz, *The Interpretation of Cultures* (New York: Basic Books, 1973), quotations on p. 46 and 100. See also Max Weber, *Sociology of Religion* (Boston: Beacon Press, 1991/1920), 6-7.

[87] See Isaac Arial Reed*, Power in Modernity: Agency Relations and the Creative Destruction of the King's Two Bodies* (Chicago: University of Chicago Press, 2020), 32.

helpful to consult a probabilistic turn from a field much removed from those (like sociology) that typically put action somewhere near the center of their analyses, but one which, in its conception of action, offers lessons for what it would mean to adopt a relentless focus on action while also not removing our analytic gaze from probability.

Probabilism in the Physical Sciences

As the quantum revolution in physics in the early 20th century wrought its changes on what we understand to be the basic nature of the physical world, the people involved in the revolution, alongside philosophers interpreting what its larger meaning might be, arrived at a series of conclusions that have not yet been fully appreciated, we believe because they demonstrate the primary role of probabilistic reasoning in these developments and so, by contrast, seem difficult to fully register (leading us to mistake some of the grandest pronouncements for specific claims about the world itself). The physicist Werner Heisenberg, who was arguably the most influential proponent of quantum theory and its challenge to a physics based on Isaac Newton, was (famously) preoccupied by both observation and probability. Specifically, he argued that only "during the act of observation" can the "transition from the 'possible' to the 'actual' take place."[88] We can calculate a "probability function" beforehand, trying to guess what will happen using our own metrics, but this "does not describe a certain event." What describes the event, "at least during the process of observation, [is] a whole ensemble of possible events."[89] The act of observation, however, "changes the probability function discontinuously; it selects of all possible events the actual one that has taken place." This leads the math to yield strange conclusions, like recording "quantum jumps."[90]

As Heisenberg considers the role of the observer in physics, he insists that this does not entail "subjectivism" in physics. What it entails is a change in what is understood as objective about probability. In Newtonian mechanics, objects have no *parte subjecti* and so objectivity does not entail a concern with *how* an observer loops into the world; the world is never an object to anybody. What an observer loops into, however, are not discrete states; Heisenberg insists it consists of possibilities made actual in the moment of observation, but which also *could* be a different possibility in the next moment. Even if we always observe the same things, this does not omit that possibilities *precede* the actual. In basic terms, Heisenberg came to the realization that if some of what we observe is probable, this indicates orientation in whatever is doing the acting (in this case, particles).

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[88] Werner Heisenberg, *Physics and Philosophy: The Revolution in Modern Science* (New York: Harper, 1958), 54.

[89] Ibid, 55.

[90] Ibid, 54.

As an observer of these trends, Bachelard inferred that because the quantum revolution rested in "objective indeterminacy in all physical observation," it "sets limits to the assignment of realistic attributes."[91] The kinetic, chaotic shifting of gaseous matter appeared to offer definitive proof that scientific "terminology should reflect the fact that we are describing a collective and not an individual reality." Thus, scientific terms should not be received nominally or as *substantial*, referring to "individual objects … known by its position in space and time … understood to be separate and distinct entities."[92] Max Planck, meanwhile, theorized the "elementary quantum of action" as one among two constants in the quantum understanding of physics (which essentially boiled down to an understanding of radiation). The quantum of action involved the "'elementary region' or 'range' of probability'" necessary to give the kinetic movements of particles a "statistical treatment."[93] In the philosopher Ernst Cassirer's words, Planck's contribution meant that statistical statements become "inexact" statements, as they cannot tell you about the "fate" of an individual particle. They cannot be statements referring "to an individual thing or event but to definite collectives."[94]

Thus, for both Bachelard and Cassirer, the quantum shift in physics essentially revolved around (conceptually at least) a redefinition of what was thought to be individual into what is now understood to be collective. To make that change meant resisting substantializing collectives, instead defining them as they appear in probabilistic reasoning: as *ranges of possibility*. For Karl Popper, these quantum theory developments lead him in exactly this direction. Specifically, they led him to reject the "subjectivist interpretation" of probability limiting it to a "measurable degree of the rationality of a belief."[95] He would argue that the subjectivist interpretation could only apply (if at all) to "certain gambling situations—horse racing, for example—in which the objective conditions of the event are ill-defined and irreproducible." By contrast, outside those idiosyncratic conditions, objective conditions are reproducible. Far from being a claim about the uncertainty of belief, "uncertainty" in quantum theory, according to Popper, refers to the *objective* uncertainty of "scatter-relations" in which "particles have paths, i.e., momentum and positions, although we cannot predict these, owing to scatter relations."

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[91] Gaston Bachelard, *The New Scientific Spirit*, translated by Arthur Goldhammer (Boston: Beacon Press, 1984/1934), 125.

[92] Ibid, 126-27.

[93] Max Planck, "The Origin and Development of the Quantum Theory: Nobel Prize Lecture, 1918," translated by H.T. Clarke and L. Silberstein, (Oxford: The Clarendon Press, 1922/1918), 13.

[94] Ernst Cassirer, *Determinism and Indeterminism in Modern Physics: Historical and Systematic Studies of the Problem of Causality* (New Haven, CT: Yale University Press, 1956/1936), 118.

[95] Karl Popper, "The Propensity Interpretation of Probability," *British Journal for the Philosophy of Science* 10, no.

To accept that point, Popper argues, we must accept something more radical: namely that "probabilities be 'physically real'—that they must be physical propensities, abstract relational properties of the physical situation," and thus what we take to be real objects are really just "*propensities to realize singular events*."[96] Popper's propensity approach, in particular, has sparked a robust literature in philosophy that questions the frequentist basis of probability theory.[97] Notably this was also a view that did not ascribe probability to a logical principle or a belief principle like "credence," both of which are objective only in an epistemological sense referring to less partiality (or "indifference") based on more evidence.[98] In this case, "objective chance" tends to mean the probabilities that can be invoked by the best system of analysis.[99] But in the critical conversation around Popper's argument, and its distinction from these more epistemological approaches, what tends to be missed is any sort of link between probability and action. For Popper, too, if propensities do exist, they can only become clear in an "experimental set-up," which is a departure from their existence in "action," which appears missing in Popper's reading of quantum theory, but not in Cassirer or Bachelard's. Combining possibility with action and objective uncertainty with probability, quantum theory in their view broke with nominalism (or "realism" in Bachelard's words) by making individual objects collective, as "collectives" of group particles, knowable by their action within a bounded

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37 (1959): 25-42, quotation is on p. 26.

[96] Ibid, p. 28 (emphasis original).

[97] An overview is available in Donald Gillies, *Philosophical Theories of Probability* (London: Routledge, 2000), chap. 6-7. Hugh Mellor develops a novel theory of propensities in his *The Matter of Chance* (Cambridge: Cambridge University Press, 1971).

[98] John Maynard Keynes ascribed to the first, while his younger colleague Frank Ramsey developed the second as a critique of Keynes. See John Maynard Keynes*, A Treatise on Probability* (Cambridge: Cambridge University Press, 1921), esp. p. 4; Frank Ramsey, "Truth and Probability," in *The Foundations of Mathematics and Other Logical Essays* (Cambridge: Cambridge University Press, 1926), 161.

[99] This is generally associated with the philosopher David Lewis, particularly his "principal principle" as rooted in a "credence function," from "A Subjectivist's Guide to Objective Chance" (in *Philosophical Papers, Volume II* [Oxford: Oxford University Press, 1986/1980]), 276-77.

probabilistic order.

This provides an insight into probabilism and indicates its novel criteria for knowledge. If we cannot talk about definite things but only *propensities*, then we always must include the possibility that they might *not* be present at all. The standard of explanation shifts toward developing models of these "compossible phenomenon" in which the signature of being real is to have a range of possibility in which to act.[100] Probabilism in the quantum revolution, then, appears not just as a way to make *us* more or less confident in our prior beliefs or hypotheses. It encourages us to identify the histories and loops that create and actualize the recordable features of the physical world. [101]

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[100] The trajectory of the biological sciences after the "Darwinian synthesis" between Mendelian genetics and natural selection also displays a kind of probabilistic reasoning, though slightly less pronounced. When variation became an important focus in the modern synthesis, distributions of phenotypes that fit an error curve forbade the necessary inferences. Evolution on the ground of actual chance combinations could "punctuate" the heightening of local order at key intervals. Thus, among the early proponents of the modern synthesis like J.B. Haldane, Ronald Fisher, and Sewall Wright, drawing Mendelian genetics into evolution by natural selection made chance and random mutation into keywords. Yet, these terms "by and large referred to very specific conditions, or facts about mating regimes, geographical isolation, or environmental contingencies, not 'ignorance'." They were *not*, in other words, epistemic. The phrase "mutations arise by chance," meant specifically "chance with respect to fitness." And this implied two things: first, that what biologists expected as fitness necessarily entailed their orientation to chance; second, and as became clearer among later authors in the synthesis, natural selection effectively marks a range of possibility instead of traits directly adaptive to environmental conditions. Mutation and recombination becomes an "energetically isolated system," even while natural selection remains the force of change. See, Anya Plutynski, Kenneth Blake Vernon, Lucas John Matthews, and Daniel Molter, "Chance in the Modern Synthesis," *Chance in Evolution* edited by Grant Ramsey and Charles Pence (Chicago: University of Chicago Press, 2016), 76-103; Jacques Monod, *Chance and Necessity: An Essay on the Natural Philosophy of Modern Biology* (New York: Vintage Books, 1973), 18-19; Stephen Gould, *The Structure of Evolutionary Theory* (Cambridge: Belknap Press of Harvard University, 2002), 144.

[101] Many of these principles have been revisited in more recent theoretical physics, which focuses on the "assembly spaces" of matter. Individual objects (planets, atoms, life-forms) are probabilistic because they have possible futures mediated by information stored in their history. History is therefore embedded in whatever we might call objective. See Sara Imari Walker and Paul Davies, "The Algorithmic Origins of Life," *Journal of the Royal Society Interface* 10 (2013): 20120869. Notably, this perspective argues against the reductionist appeal of the view that "all life is nothing but chemistry." A probabilistic approach deviates from concepts drawn into sociology from the chemical origins of life, specifically autocatalysis, or "how nodes and transformations reconstruct themselves through time in the face of continuous turnover in the set's parts." John Padgett, "Faulkner's Assembly of Memories into History: Narrative Networks and Multiple Times," *American Journal of Sociology* 124, no. 2 (2018): 406-78, quotation is on p. 407. See also John Padgett and Walter Powell, *The Emergence of Organizations and Markets* (Princeton: Princeton University Press, 2012), chap. 2. This framework neglects a "space of possibilities" or "assembly space" which presents a chemical origin argument with an information problem, i.e., "Explaining the chemical substrate of life and claiming it as a solution to life's origin is like pointing to silicon and copper as an explanation for the goings-on inside a computer. It is this transition where one should expect to see a chemical system literally take-on 'a life of its own', characterized by *informational dynamics which become decoupled from the dictates of local chemistry alone* (while of course remaining fully consistent with those dictates). Thus, the famed chicken-or-egg problem (a solely hardware issue) is not the true sticking point. Rather, the puzzle lies with something fundamentally different, a problem of causal organization having to do with the separation of informational and mechanical aspects into parallel causal narratives. The real challenge of life's origin is thus to explain how instructional information control systems emerge naturally and spontaneously from mere molecular dynamics." Walker and Davies, "Algorithmic Origins."

Probabilism in the Human Sciences

If probabilistic reasoning in physics focuses on (quantum) action then so too does probabilistic reasoning in human science focus on (human) action. But rather than being too far removed from what data tells us is the "order" of the world, action is intimately linked to it, because both action and order are probabilistic. All human sciences permit a "revelation of order," as Foucault argued; this revelation comes with the recognition (*reconnaître*) that, in the midst of the fog, the noise, the randomness of what happens in moments and instant slices of time, "things are in themselves capable of being ordered; the fact, in short, that order *exists*."[102] Not only that order exists, but that *we* create it; not only do we *see* order, we are simultaneously seen *by* it. In short, we find order, and we find that we are *making* it too. Foucault took this to be a statement about knowledge and about *epistemes* creating contingent interpretations of the world, leading him toward grand pronouncements about the "end of man" as *merely* an epistemic question.

But if, for reasons already stated, we bracket that approach, then Foucault's claims can only *otherwise* be a statement about objective probability.[103] Human science does not create this order either, in this sense, but it does enable a (reflexive) revelation of it by following lines of action to infer order.[104] Foucault discusses both Comte and Marx in alignment with each other, as exemplifying a mixture of positivist and eschatological traits modeled essentially on "the experience of the body." This is an argument against introspection, but it does something further by asserting the impossibility of being *both* actor and observer.[105] For us, this manifests in a particular way in contemporary human science, independently of collapsed grand narratives: namely, if action and prediction are not the same, then we cannot be both actors and observers. To put this more bluntly: according to this perspective, if we act, we do not predict; and if we predict, we do not act. As we have mentioned and above, and as we will return to again, this is the Comtean divide, here substantiated in more contemporary terminology. But it substantiates elsewhere too, as we will see, particularly in what human scientists (especially sociologists) understand as *interpretation*.

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[102] Foucault, *The Order of Things*, xx-xxi.

[103] Bourdieu specifically takes Foucault to task on this point, by finding that while Foucault's persistent focus on "discourse" is relational, it also "refuses to consider the field of *prises the position* in itself and for itself" or the fact that relations are consequential only as they shape more or less probable action ("position-takings"). Only a field theory can explain that. See Pierre Bourdieu, "The Field of Cultural Production; or, The Economic World Reversed," *Poetics* 12, no. 4-5 (1983): 311-356, quotation is on p. 315.

[104] In Foucault's preferred form, this allows a sort of desubjectivation, a distance from what the order makes us to be, with "us" becoming actual only in the moment of the disidentification itself. See Foucault, *The Order of Things*, 387; Foucault, "What is Enlightenment?" in *The Foucault Reader,* edited by Paul Rabinow (New York: Pantheon, 1984), 50.

[105] Foucault, *The Order of Things*, 320-21.

The key, as we claim to bring probabilism into human science, is to make new distinctions in order to break old ones. If we are to pay heed to potentiality as the central mode in which social kinds exist then we have to break the Procrustean dichotomy of interpretation and probability. This requires that we no longer mistake probability for frequency. It will also require that we retrieve a forgotten terminology to not recommit to the equivocation between these two, or associate interpretation with the radically contingent. Thus, we recommend adopting the Weberian language of *Chance*, which refers most fundamentally to a "judgment of possibility" or, in common discourse, an *expectation*, making this indelible to meaningful social action. In less established form, this means that action assumes the characteristic features of a guess, or in a more established form, of an expectation or presumption. These are ways of looping into probabilistic environments that are real but unknowable. We might be able to measure frequencies in the long run, but we can infer very little from them without referring to objectively existing potentials and to judged *Chances*.

While saving a larger discussion for later chapters, what we emphasize now is how explanation in probabilistic human science will revolve around this interface of judgment and possibility. This is not as unusual a recommendation as it may sound. In recent years, John Levi Martin has made the case for the restoration of judgment in human science after its degradation in the 19th century, coinciding with the development of frequentist understandings of probability.[106] Martin builds his case by picking up threads left by Immanuel Kant: judgments are not a particular mental content but more a general assessment of them, specifically whether they are true, good, or beautiful. A doctor, say, knows what typhoid is (as a concept), but might not recognize it in an individual case. To do that requires a combination of sense impressions and the concept, which is thereby rendered indeterminate, problematic. What are the grounds for securing the judgment? As Martin pursues a similar idea, he forges a path that we also follow: judgments are *not* arbitrary or, in probabilistic terms, they are not contingent (except when they have to be); but this is not mainly because judgments classify "sets of relations."[107] We can go a little further past that insight. A doctor judges typhoid probabilistically, not by recording frequencies, but by linking initial conditions to outcomes, which below we describe as *tests*.

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[106] John Levi Martin, *The Explanation of Social Action* (Oxford: Oxford University Press, 2011). Martin appeals to Cassirer, among others, in establishing this perspective, reiterating recommendations that Cassirer made of the human sciences not as attempts to arrive at "universal qualities of being" but to "ascertain a fundamental form of judgment and define it in all its numerous ramifications." Cassirer, *The Philosophy of Symbolic Forms, Vol. 1: Language* (New Haven, CT: Yale University Press, 1980/1923), 80. Here, that judgment would be of probability and possibility.

If the human sciences are, *pace* Foucault, not to be trapped by an "analytic of finitude" when they are organized around the study of judgment, then the nature of that judgment cannot be of just anything. It must be of something that can also be empirical. It must be a judgment, in other words, that can also be the source of observable actualities, even if it is not their *only* source. The philosopher Edmund Husserl offers a relevant idea here. According to Husserl, "possibility, probability … occur in the sphere of judgments as a result of the fact that possibility or probability come to be expressed and then introduce a distinctive kind of meaning-content into this sphere."[108] Husserl's suggestion seems to be that judgments of probability are not judgments of truth because what they judge cannot be true, but neither for that matter can they be beautiful or good. This would deviate from more belief- and credence-based epistemological views of probability. Judgments of probability, rather, add their own distinct meaning-content to whatever happens to be their object (e.g. Is the art typical? Is the food common? Is the word usual?). As rooted in "their own sources," these judgments, in Husserl's view, puts us within a "domain of perceptual things" and to "necessarily [perceive them] in a certain orientation" as probabilities durable enough for us to expect them, or be surprised by them, but not so durable as to make the world entirely predictable.[109]

The perspective that Husserl advocates here appears to come through a kind of lost lineage of probabilistic reasoning, starting if anywhere with the German physiologist Hermann von Helmholtz, his revision of Kant, and extending through his "disciple" Johannes von Kries.[110] For Helmholtz, sensory impressions were subject to probabilistic judgments, such as when we "think" we see a rope in front of us before finally realizing it is a rattlesnake. Kries would build on this foundation and associate all of probability with judgments rooted in objective "ranges" or *Spielraum*. We recover this lineage in more detail below, of which Max Weber is a part and which, among other things, does not respect a firm natural and human science boundary. Only more recently, with predictive processing, have we seen a recovery of some of these perspectives, particularly the idea that our perception of the world is less like a representation and more like a guess.

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[107] Martin, *The Explanation of Social Action*, 241. Luc Boltanski and Laurent Thevenot make a similar proposition, as we examine below, and which is keyed more toward judgments of probabilities as opposed to relations (or what they call "culturalism"), which is evident in their concentration on "tests." The problem we find in their approach is how they make judgment too content-based and deterministic (of an "order of worth"), again strictly removed from probability. Luc Boltanski and Laurent Thevenot, *On Justification: Economies of Worth* (Princeton: Princeton University Press, 2006/1991), 144ff. Elsewhere, however, Bolstanki actually pushes the test-based framework in a more probabilistic direction; see Luc Boltanski, "Domination Revisited: From the French Critical Sociology of the 1970s to Present-Day Pragmatic Sociology," *Graduate Faculty Philosophy Journal* 29, no. 1 (2008): 27-70; see also, Noortje Marres and David Stark, "Put to the Test: For a New Sociology of Testing," *British Journal of Sociology* 71 (2020): 423-443.

[108] Edmund Husserl, *Logic and General Theory of Science*, translated by Claire Ortiz Hill (Dordrecht: Springer, 2019/1910-1918), 249.

[109] Ibid, 250.

To reason probabilistically gives action this defining feature as orientation: we act to learn probabilities in the environment, and even though they remain unknowable, we can still maintain our own expectation against the contingent event, the chance cause, the unexpected intervention. Below, we distinguish this from action as subjective meaning or problem-solving; but far be it to limit these claims to an action theory. Like Martin, we argue that incorporating judgment in human scientific analysis breaks the mold of subjective and objective, micro and macro. This is particularly true when the mode of judgment is probability and possibility. Terms like "environment," "structure," or "situation," if they are not to be either nominalized or substantialized, have a necessarily restricted reference to objective probabilities retrievable from orientations to varied spatial ranges and temporal durations, which are judged, expected, and enacted based on orientations to them. We can represent them using frequency counts and statistics, select sources of variation to simulate their range of possibility, even speculate on their probabilistic patterns of cause and action and the means for looping into their order. We can also ask people about probabilistic orders; we can observe their dealings with them.[111] They might know more than we realize; yet those same people, while they may know probabilities so intimately their knowledge eludes speech (they know more than they can say), do not act based on percentages and correlations. They act based on potentials to which they align themselves by looping in, finding in them sources of hope or fear, based on what they expect or guess. This refers to a distinct "meaning-content" from judging what is possible or probable.

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[110] Hermann von Helmholtz, *Treatise on Physiological Optics, Volume Three: The Perceptions of Vision*, edited by James Southall (New York: The Optical Society of America, 1925/1867). Helmholtz alludes to his revision of Kant's approach to apperception (or judgment) of space. Kries, especially, draws these links in one of his many appendices to Helmholtz's text (see especially 635ff). Kries has been referred to as "Helmholtz's greatest German disciple." See R. Steven Turner, "Consensus and Controversy: Helmholtz on the Visual Perception of Space," in *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science*, edited by David Cahan (Berkeley: University of California Press, 1992), 198. For a possible influence of Johannes von Kries on Husserl, see Carlos Lobo, "Husserl's Logic of Probability: An Attempt to Introduce in Philosophy the Concept of 'Intensive' Possibility," *Meta:Research in Hermeneutics, Phenomenology, and Practical Philosophy* 11, no. 2 (2019): 501-546.

[111] See Michael Sauder. "A Sociology of Luck." *Sociological Theory* 38, no. 3 (2020): 193-216.

Two Basic Principles of Probabilistic Reasoning

To summarize these varied points, we arrive at the following two basic principles, which are unique to the probabilistic style of reasoning. We rely on them to pursue the analysis that follows:

> First, *probability is more real than "reality."* This is the probabilists' main gambit, rooted in a relentless focus on action. Reality, after all, is only a limiting concept for what can never be exhaustively known or understood. The probable, on the other hand, is real for whoever acts. The focus rests, in short, on accounting for the judgment of probability as what translates possibility into actuality through action.
>
> Second, *whatever is actual must have tamed chance*. This involves both the construction of ranges of possibility and the looping in of action. For probabilism, chance means the potential of pure difference or disconnection in every instant.[112] Actors tame chance by enrolling themselves into a looping relation with the world, judging certain things as probable rather than affirming "whatever turns up." There must be something to loop into, which begs the question of how ranges of possibility appear in the first place.

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[112] Bachelard draws on the forgotten sociologist Eugène Dupréel's idea of "La probabilité ordinale," or what involves an "operation of consolidation" or "agglomeration." For Dupréel, the non-epistemic "degree of probability" that brings the parts into alignment or sequence varies by an exterior influence, at first, but then by "interiority" as a formed object. "If the supporting force is quite weak or null, then, all things being equal, there will be many more probable circumstances that will result in the destruction of the supported relations than there will be favorable interactions. So if two pebbles are held in place by a very strong force, like two nail heads hammered one beside the other into an oak beam, then this (supporting) force will cancel out many dangers of destruction, leaving the field free for favorable conditions for consolidation." Dupréel quoted in Bachelard, *The Dialectic of Duration*, 98. See also, Eugène Dupréel, "Théorie de la consolidation. Esquisse d'une théorie de la vie d'inspiration sociologique," in *Essais pluralistes* (Paris: Presses universitaires de France, 1949), 161; Gilles Deleuze and Felix Guattari, *A Thousand Plateaus* (Minneapolis: University of Minnesota Press, 1987/1980), 328-29. Recently, there has been a small Dupréel revival outside of Anglophone sociology; see Margot Elmer, "Articulations et frontières des sciences sociales: La jeunesse intellectuelle d'Eugène Dupréel (1896-1925)," *Revue Européen des Sciences Sociales* 58, no. 1 (2020): 93-116.

In what follows, we reorient sociology around these tenets by recommending, with Max Weber, that sociology take as its object the examination of probabilistic order.[113] This emphasizes an analytic dualism: probabilistic orders, on the one hand; the key variables, categories, structures, and meanings that usually do their bidding, on the other. Only such a dualistic focus can allow us to bring our explanation into action, more specifically by putting the key factors into action, and understanding the outcome of interest as the outcome of action. Probabilistic orders are substantively neutral, yet they organize most of our dealings with the social world and the worldly offerings we perceive. We cannot help but *loop in* and coordinate with objective probability. It is found in expectations, though it remains strangely fleeting, never entirely encapsulated by what we anticipate, no matter how experienced we are. Probabilistic orders can be constructed in many ways, as we shall see; more critically, we construct it ourselves in making judgments and orienting to *Chance*.[114]

The Road Ahead

While related to the statistical style, and historically appropriated by it, probabilism remains independent and distinct, for reasons we develop further in chapter 3. In the next chapter, we link probabilism specifically to sociology, our home discipline, and argue that sociology is already probabilistic; the problem is that it does not recognize itself as such. We recount in detail some primary factors responsible for this neglect in chapter 4 and then attempt a recovery and reconstruction of probabilism in sociology through two focused case studies of Weber and Bourdieu.

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[113] These two principles are different than what are sometimes referred to as the "sum and product rules of probability," the first of which says that all events must sum to a total of one and the second of which says that two variables "may be decomposed into the product of the probability of one variable and (P(x)) and the conditional probability of the second variable given the first (P(y|x))" (Paar, Pezulo and Friston, *Active Inference*, 17-18). Both find application in statistical reasoning; they also find more recent application as part of Bayesian reasoning, or a mode of probability that follows the lessons of Thomas Bayes. We will return to this in chapter 3. For now, we will give an all-too-brief summary. Bayesian probabilities amount to a confidence in prior beliefs based on posterior states, such that if we have, for example, learned that if something is a frog it probably jumps, and we observe what we believe, at first, is a green apple, we revise these beliefs but confirm others in a posterior state: it *jumps*, so it definitely is a frog. Bayesianism is critical of "punctuate states of mind" that presume a consistent degree of certainty ("confidence"), thus it aligns closely with data science and machine learning's promise of "permanent learning." Learners weigh options as more or less probable based on a degree of confidence. For Bayesianism, even if they do not imply learning outside of frequency calculations, degrees of confidence (or certainty, belief) are still subject to numerical calculation, as opposed to taking form in judgment or action. Bayesianism does not account for a bounded learning environment, however, like those of probabilistic orders, in which something quantitative measurable, like how much is learned or for how long, does not always predict certainty or confidence. Rather, confidence pertains more to learning sources (or initial conditions in Kries' terms) of probability *in* the environment, learning adequate causation and capacities for action, learning what constitutes the probabilistic order *sui generis*, whatever it orders. Florent Meyniel, Mariano Sigman, and Zachary Mainen, "Confidence as Bayesian Probability: From Neural Origins to Behavior," *Neuron* 88, no. 1 (2015): 78-92; see also, Scott Lynch and Bryce Bartlett, "Bayesian Statistics in Sociology: Past, Present and Future," *Annual Review of Sociology* 45 (2019): 47-68;

[114] Peter Berger and Thomas Luckmann, *The Social Construction of Reality* (New York: Doubleday, 1966).

In the third and last part of the book, we discuss what difference probabilism can make for sociology and human science far beyond. We describe probabilism in cognitive science and draw its links with sociology, the synthesis leading to insights unique to cognitive social science (chapter 9). We build on these proposals to describe the implications of probabilism for method (chapter 10) and, more generally, for how we attempt to grasp the social world (chapter 11). We conclude the book with a short epilogue which, like the prologue, tries to enrich the discussion by drawing in larger themes that, though they might be omitted from other disciplines or styles of reasoning, are not for probabilism or for probabilistic sociology.

Chapter 2 - Probabilism and Sociology

> *Chance can mean our conviction that it is impossible to give a causal explanation, or our faith that somewhere, someone* could *give an impersonal explanation if they cared enough, which they don't. Whether the world has millions of causes or not a one, "chance" is a polite way of ending the inquiry.*
>
> ~ John Levi Martin, *The Explanation of Social Action*

Sociologists have long condemned the individualistic, ahistorical, non-emergent and non-processual, and all-too-static tendencies of other fields, especially economics and psychology.[115] More recently, the definition of what constitutes social reality and, by extension, how exactly sociologists should go about explaining it. If positivism had served as a kind of half-fractured crutch for the justification of sociological knowledge, its collapse over the last several decades has left a vacuum of sorts in sociology's sense of its own project.

Though much has been associated with positivism, broadly speaking, it lent the sociological project a certain tenor based on interrelated themes and directions: explanations should be associated with generalizable covering laws; sociology is a science in the same way as other sciences; a critical task is for sociology is to create a "'natural science of society' which can hope to reproduce a system of laws directly similar to those achieved in the natural sciences."[116] Directions and guidelines like these are of disputed validity in sociology today, though in the absence of anything of comparable impact and coherent direction, it can be "much harder for young sociologists to do good work." Beyond this, "when push comes to shove—when editorial boards and tenure committees weigh in, and final decisions are made about publications and positions—it is to the positivist standards that we must all still appeal."[117]

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[115] See in particular, Andrew Abbott. *Processual Sociology* (Chicago: University of Chicago Press, 2016).

[116] Anthony Giddens, "Positivism and its Critics" in *A History of Sociological Analysis* edited by Tom Bottomore and Robert Nisbet (London: Heinemann, 1979), 238.

[117] Philip Gorski, "What is Critical Realism and Why Should You Care?" *Contemporary Sociology* 42, no. 5 (2013): 658-670, quotation is on p. 661.

So it has become imperative, at least for some, that a programmatic framework of comparable breadth as positivism fill the void its dwindling fortunes have left in our post-positivist time.

Yet what these conversations about sociology's present and future in a context definitively beyond positivism have not discussed is *probability*, which is consequential. Despite its reputation, data science shares sociology's post-positivism. It does not seek covering laws; in fact, it recommends "permanent learning." If data science really is a "fourth approach to scientific discovery," it must also be rooted in its distinction from the other, older approaches, including whatever indebtedness they might have had to positivist aspirations. Among other reasons, this does (and could further) fuel the appeal of data science in a field like sociology.

Fearing a kind of conceptual takeover, many of the boldest theoretical frameworks in post-positivist sociology proposed over the past half-century have overlooked the potential of a data-driven takeover. The general concepts that sociologists have in their toolkit are non-probabilistic in the *strong* sense mentioned earlier. They do not seem able to accommodate ranges of possibility, held together by orientations, taking form in expectation and probabilistic judgment. This presents a problem, we argue, for many of the inferences sociologists make, and particularly, for how our conceptual and methodological tools for making inferences leave us flat-footed in the face of data science's direct, rather than mediated and pre-structured, interface with chance.[118]

As we have argued, data science is not unique for the reasons that its boosters might tell you. It is unique because it is *probabilistic*. This has certain, definite virtues, yet how data science implements probabilism comes with limitations, particularly its incapacity to translate probability into action, favoring the algorithmic black box over judgment. If data science breaks with a naive substantialism (and nominalistic reasoning), then it does not return to lived reality, where probability alone can be concrete. To the degree that its promise rests in datafication alone, it is a false promise, a fool's gold. Data science simply, though more covertly, invites back in the same problems of nominalism and abstraction as those it critiques.[119]

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[118] Consider, for example, categories that distinguish social identity. For weak probabilism, these must be binary categories (dummy variables) to enable aggregation and model fitting; the same is true for these categories as (biopolitical and nominalistic) "state categories" recorded by a census. Data science presents something different: "those aspects of identity once thought fixed or almost unchanging—gender, race, citizenship, nationality—become readable in this virtualized way. For instance, patterns of web browsing and other digital activities can be mined to determine whether one is likely to be a woman or a man. But these assessments (another set of algorithmically derived classification situations) are always flexible and provisional, depending on data flowing in and on the particular combination of classifiers. Consequently, the algorithmic inference of gender identity may change at any moment. Technology, then, builds on and feeds into a broader cultural shift by which gender identity may be increasingly experienced as multiple and fluid rather than binary and stable." (Jenna Burrell and Marion Fourcade, "The Society of Algorithms," *Annual Review of Sociology* 47 (2021): 213-237, quotation is on p. 227). The data science category of gender identifies a range against any of its specific manifestations, or what we can more simply translate as *fluidity*. Yet, fluidity here only has a data science meaning as datafied behavioral traces on which an algorithm constantly learns and makes classificatory inferences. It does not translate into lived reality. A sociological probabilism would make that link; for instance, in the form of what Ellis Monk calls "cues for categories." See Ellis Monk "Inequality without Groups: Contemporary Theories of Categories, Intersectional Typicality, and the Disaggregation of Difference," *Sociological Theory* 40, no. 1 (2022): 3-27.

Here we will situate probabilism among some options that have developed in the sociology's post-positivist moment. Two of those options will help demonstrate the distinctiveness of probabilism for sociology: *realism* and *interpretivism*. Probabilism shares aspects of both yet pivots away from them on several key fronts. Primarily, probabilism breaks with what is arguably the most significant holdover from the positivist era, but which is rarely acknowledged as part of the temperature-taking in the field: namely, the continued centrality of statistical analysis to sociological knowledge, and the attempt to reconcile significant movements in social theory with a method that, at least in its stance on probability, remains essentially unchanged from sociology's positivist past.

Beyond Realism and Interpretivism

One approach put forth as a salvo for post-positivism is by realists who argue that beyond the empirical observations we make, there must be real structures and mechanisms behind them. Specifically, as real structures and mechanisms enter into unique combinations, the emergent effects *cause* what we record as empirical effects and actual experience. Realism, in general, makes three fundamental commitments: first to the "mind-independent existence" of the things that science studies; second to the literal interpretation of scientific claims, meaning that theoretical statements, even if they feature unobservables, are always either true or false (never, for example, metaphoric); and third, that theoretical claims, given this literal interpretation, constitutes knowledge of a mind-independent reality.[120] Generally, realism is the *de facto* focus of the practical philosophy of natural science and serves as parameters for human knowledge more generally.[121] While the empirical and actual (or "phenomenal") are essential aspects of knowledge, by no means are they sufficient. According to realists, we cannot make a knowledge claim based only on the "constant conjunctions" of repeated patterns. We must instead allow ourselves to refer to unobservables that constitute what the world is really made of.[122]

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[119] John Levi Martin (*The Explanation of Social Action*, p. 321) finds, in Marx and Engels, a statement about the sequence of moves that is problematic for both statistical weak probabilism and data science strong probabilism: "First of all an abstraction is made from a fact; then it [the fact] is based upon the abstraction. That is how to proceed if you want to appear German, profound and speculative." Marx and Engels here (*The German Ideology*, p. 530) critique their German idealist brethren the Young Hegelians. In the Epilogue, we discuss parallels between idealism and probabilism, which makes data science vulnerable to the same fictions in its denial of a basis in *action* (and its lived reality).

For some realists, this can be parsed out through careful study of the key scientific practice of experimentation. Of influence in sociology recently is the argument put forth by the philosopher Roy Bhaskar to this effect: "It is not necessary that science occurs. But given that it does, it is necessary that the world is a certain way."[123] Experimental activity, the key knowledge practice of the most prevalent styles of reasoning in science, would not be intelligible if the world did not have a *depth*, with structures unapparent to us but that generate what *is* apparent to us empirically.[124] While scientific intervention is responsible for the regularities we perceive in the world, even in a "world without men the causal laws of science would continue to prevail, though there would be few sequences of events and no experiences with which they were in correspondence."[125] For sociologists who recommend *this* brand of realism, only with such an approach can sociology retain any commitment to causal explanation.

A different perspective in sociology has generally become associated with a criticism of realism: *interpretivism*. The problem with realism, for the interpretivist, is that there is no definitive way to say that what we prefer to call social reality is really what is "out there." The realist solution for such a counterclaim is to draw attention to a "compensator" that can analogize between the practical success of the experiment in natural science and what can be reflexively acknowledged as necessary conditions for social practice and human experience as observable in human science. In application, this takes the following form: "what must be the case for the experiences grasped by the phenomenal forms of capitalist life to be possible."[126] However, according to the interpretivist, this is *not* an effective block on moving "from any sort of knowledge to what it implies exists (from belief in witchcraft and its practice [spell-casting] to the existence of demons, for example)."[127] The human scientist and social theorist have nothing to prevent their realist best intentions from leading them into interminable debates about what is more real than the next thing, with no resolution in sight. What is real will, in this scenario, depend on what our knowledge claims *need* to be real.

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[120] Stathas Psillos, *Scientific Realism: How Science Tracks Truth* (London: Routledge, 1999).

[121] Ronald Giere, *Explaining Science: A Cognitive Approach* (Chicago: University of Chicago Press, 1988).

[122] Gravity, for instance, is accepted as real even though it is not always actual. What is actual are those things affected by gravity, particularly if they are empirically (experientially) available to us. We can imagine or design scenarios where other real mechanisms will counteract gravity, but gravity itself has not disappeared. If it happens to have been neutralized, it remains real.

[123] Roy Bhaskar, *A Realist Theory of Science* (London: Verso, 1998/1975), 33; see also Christian Smith, *What is a Person? Rethinking Humanity, Social Life and the Moral Good from the Person Up* (Chicago: University of Chicago Press, 2011); Timothy Rutzou and George Steinmetz (eds.) "Critical Realism, History and Philosophy in the Social Sciences," *Political Power and Social Theory* vol. 34 (2018); Douglas Porpora, *Reconstructing Sociology: The Critical Realist Approach* (Cambridge: Cambridge University Press, 2015).

[124] Bhaskar, *A Realist Theory of Science*, 35. See also Ian Hacking, *Historical Ontology* (Cambridge: Harvard University Press, 2002/1992), 33ff.

[125] Bhashkar, *A Realist Theory of Science*, 34.

If the interpretivist criticism holds, realism becomes untenable for the human sciences, especially for sociology because so much of what sociologists do seems to rest on interpretation. And this is the interpretivist's fundamental point: "both the social life under study and the construction of sociological theories are shot through with problems of conceptualization and signification—that is, problems of meaning … The construction of sociological explanations is continually dependent on both meaning-in-society and upon sociological theory as itself a contested meaning-structure with a contingent relationship to the reality it studies."[128] All of this is contingent, meanwhile, on the basic realist idea that science involves capacities for knowledge that cannot be found among non-scientists, and so, this means that a realist science must "break" with those non-scientific (or folk) ways of knowing to reach truer statements about the world. Many would claim that if science, let alone human science, did *not* do this then it would have no grounds for distinction relative to folk explanations themselves.

For the interpretivist, on the contrary, we get off on the wrong foot when we commit to epistemological break. The goal for the human scientist is not to find something that only the scientist or analyst has access to and the people whom they are studying do not. The goal is to find common ground between two sides of knowledge, and we find that common ground in *meaning*. Both the analysts and actors are oriented by meaning, with theory being the "meaning system" of sociological analysis.[129] What analysts bring to the table are tools able to "comprehend the meaning worlds of others," or the task of *Verstehen*, creating *understanding*. Theory, then, is not a tool that allows us to effectively "retrodict" beyond our observations to name and understand the real structures that those observations must imply. It serves an interpretive purpose, to be used to allow analysts to "reference the meaningful particularities" exhibited by people in context, through "connection and comprehension" of the worlds of those they investigate. This emphasis on the "experience-near," in Clifford Geertz's words,[130] draws attention to locality and context in interpretivist analysis, which also emphasizes "arbitrary and conventional formations of meaning" that make it impossible to describe real structures and mechanisms by themselves, out of context, apart from simply treating them as pure abstractions.[131] Real structures and mechanisms are never *not* situated in a meaningful world.

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[126] Roy Bhaskar, *The Possibility of Naturalism* (New York: Harvester Press, 1979), 65. See also p. 59 for a discussion of the "compensator" that can draw realism into human science.

[127] Isaac Reed, "Justifying Sociological Knowledge: From Realism to Interpretivism," *Sociological Theory* 26, no.2 (2008): 101-129, quotation is from p. 112.

[128] Ibid, p. 114.

Thus, out of the collapse of positivism and the disciplinary turmoil of "the sixties," through the enticements of realism and, more recently, the pulling together of theoretical strands as interpretivism, the result is a "dappled world" of sociological analysis, less because different frameworks find themselves in the role of "nomothetic machines" unequally suitable to a patchwork of contexts, and more like competing, encompassing solutions to sociology's post-positivism problem.

Yet, as both realists and interpretivists will admit, these efforts, while having to a certain extent shaped the field, remain mostly overshadowed by the remnants of positivism, which typically means that sociological analysis starts with a statistical fact or some kind of constant conjunction, which must be presented as of "general" significance to validate itself, that it must consist of "universal and exception-less statements," with a range of application somewhere between "everywhere and always," and that, in turn, it ideally allows for *prediction*, even if this is not an explicit focus of the analysis.[132] Both realists and interpretivists advocate dramatic pivots away from these essential terms, and, alongside other post-positivist frameworks like analytic sociology, tend to make that pivot by emphasizing *mechanisms* as either the causal source for the observed correlation, the "cogs and wheels" of the process that accounts for a relationship of statistical dependence or qualitatively-derived pattern (which can be differently framed as the "emergent causal powers of related entities in a system"), or as the "stringing together signs in action" that in turn accounts for the correlation.[133] The problem with these approaches, however, is that they translate a probabilistic phenomenon *away* from probability to explain how probabilities can *themselves* be explanatory. This is despite the many probabilistic aspects of mechanisms.

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[129] Isaac Reed, *Interpretation and Social Knowledge: On the Use of Theory in the Human Sciences* (Chicago: University of Chicago Press, 2011), 122.

[130] Clifford Geertz, "From the Native's Point of View: On the Nature of Anthropological Understanding," *Bulletin of the American Academy of Arts and Sciences* 28, no. 1 (1974): 26-45.

[131] Reed, *Interpretation and Social Knowledge*, 146.

[132] Gorski, "What is Critical Realism?", 661.

The focus on "emergence" common among realist approaches to mechanisms must, at least in principle, be the work of chance-reducing relations that affords a specific emergent outcome. If it is not to exist all the time, anything emergent can only exist as a potential or possibility created from related entities. Beyond this is the considerable attention given to "multicausality" and "contingency" as constellations of mechanisms that give rise to actual events and experiences but "are not repeatable in a general way." Yet, the fact that their gathering has no apparent duration goes unexplained.[134] Likewise, the kind of iterated meaning-making sequence favored by interpretivists must unfold in time and be maintained against the chances that it will *not* signify in the next instant. This implies an argument about duration. Generally, this can be ignored if we propose that meaning occurs within "systems" or in the form of "codes."[135] But if we are to appreciate the effect of these as a "stringing together of signs" then we cannot give them duration by (our) theoretical fiat. Rather, in this case, it is a puzzle that coherence and predictability (objectively) exist *in the form of* a system or code of meaning.[136]

David Hume's Lesson

Like realism and interpretivism, probabilism can serve as a framework to help sociologists clarify what they are doing, hopefully help them do it better, and possibly provide a programmatic framework for the future. What both interpretivism and realism seek to avoid are explanations that focus primarily on "constant conjunctions," as associated with the philosopher David Hume and his argument that beyond a conjunction of successive events that we can directly observe, we have no right to claim any further knowledge.[137] From this angle, knowledge simply *is* an observable correlation, about which we can only be as certain as our most recent observation. Particularly in the case of the most influential strains of realism in sociology, Hume's "correlationism" is the principal enemy, and for post-positivism more generally, the tradition of positivism rooted in causal analysis from statistically derived, "constant correlations" is to be avoided at all costs.[138]

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[133] Peter Hedstrom and Richard Swedberg, "Social Mechanisms," *Acta Sociologica* 39, no. 3 (1996): 281-308; Phillip Gorski, "Social "Mechanisms' And Comparative-Historical Sociology: A Critical Realist Proposal" in *Frontiers in Sociology* edited by Peter Hedström and Björn Wittrock (London: Brill, 2009), 147-194; Carly Knight and Isaac Reed, "Meaning and Modularity: The Meaning of 'Mechanism" in Sociological Explanation," *Sociological Theory* 37, no. 3 (2019): 234-256.

[134] George Steinmetz, "Critical Realism and Historical Sociology: A Review Article," *Comparative Studies in Society and History* 40, no. 1 (1998): 170-186, quotation is on p. 177; Claire Decoteau, "Conjunctures and Assemblages: Approaches to Multicausal Explanation in the Human Sciences," *Political Power and Social Theory* 34 (2018): 89-118.

[135] Matthew Norton, "Mechanisms and Meaning Structures," *Sociological Theory* 32, no. 2 (2014): 162-187.

[136] See William Sewell, *Logics of History: Social Theory and Social Transformation* (Chicago: University of Chicago Press, 2005), 166-67.

For the probabilist, these responses are premature. We can still learn something from Hume, as he offers us a much-needed probabilistic insight. A key passage from Hume, which, in part, is read typically as recommending the much-bemoaned correlationism, is more accurately read not as a claim about causation per se, but about habit- or disposition-formation. As we watch a "billiard-ball rolling in a straight line towards another," Hume writes, "may [we] not conceive that a hundred different events might as well follow from that cause? May not both these balls remain at absolute rest? May not the first ball return in a straight line, or leap off from the second in any line or direction? All these suppositions are consistent and conceivable."[139] We are, nevertheless, still bound by an *expectation* that something specific *will* happen, at least if we have witnessed the same scenario before. No matter what we might imagine *a priori,* we cannot remove this expectation, as a perceptual *habit*, that arises because we have borne witness to a repetition.[140]

Hume describes a kind of "pocket of predictability" one step removed from chaos because it gives us what he calls "opinions."[141] If we push this idea a bit further, then the task of knowledge shifts away from causation and toward more probabilistic questions: less, did this billiard ball cause that billiard ball to move across the table? More, in what order of things is this sequence probable? How, in his case, does the smacking of one billiard ball into another lead to these expected results? Why are these not separate events, but instead a kind of *unity*?

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[137] Philip Gorski, "The Poverty of Deductivism: A Constructive Realist Model of Sociological Explanation," *Sociological Methodology* 34, no. 1 (2004): 1-33, 16; Reed, *Interpretation and Social Knowledge*, 132; Bhaskar, *Realist Theory of Science,* 12ff.

[138] Andrew Abbott, "The Causal Devolution," *Sociological Methods and Research* 27, no. 2 (1998): 148-181.

[139] David Hume, *An Enquiry Concerning Human Understanding,* edited by Stephen Buckle (Cambridge: Cambridge University Press, 2007/1748), 32.

[140] Gilles Deleuze, *Empiricism and Subjectivity: An Essay on Hume's Theory of Human Nature* (New York: Columbia University Press, 1993/1953), 16.

[141] The phrase "pocket of predictability" is borrowed from Lorraine Daston, *Rules: A Short History of What We Live By* (Princeton: Princeton University Press, 2022), 266; see also Lorraine Daston, "Mechanical Rules before Machines: Rules and Paradigms," 2019 SSRC Fellow Lecture, https://www.youtube.com/watch?v=6xErFnyjMAA&t=9s

The key to answering these questions, for Hume, is to recognize how we will form habits via repeated experience of patterns, sequences, and rhythms. Perceptual and cognitive habits arise inductively, and rather than be filtered through the mind or self, our reflection on having acquired habits *constitutes* both the mind and self. Considering this leads us into an interesting space, one in which the actualities we encounter as things and events are not constituted of causal necessity (as implied by realism) or historical contingency (as implied by interpretivism), but of *probability*. This is the modality of habit or "disposition"—what will unfold with predictability, if the world is right.[142]

Importantly, Hume does not deny causation; he simply denies our ability to ground causal epistemic claims using only our own thinking.[143] He also suggests that we can give events an equal possibility in thought that they do not have in reality, which is governed instead by probability. An equal possibility in thought can mirror an equal probability in reality only when we are dealing with something that resembles a game of chance (Hume also uses a gambling metaphor). While realists try to find a necessary link of cause and effect, interpretivists allow for only one source of contingency. Regardless of whether we commit to necessary cause and effect links by leveraging a definition of reality, or by contrast, argue that those links are subject to the arbitrariness of formations of meaning found in historical times and places, we engage in probabilistic reasoning. If we suspect a given causal sequence, for instance, we must ask the further question of what makes the sequence probable against other possibilities? And what are those other possibilities? How does this sequence have duration? How can it repeat? Can we identify a distribution of possible outcomes? And how do these outcomes become "outcomes"?

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[142] A similar argument involves what the philosophers Stephen Mumford and Rani Anjum call "dispositional modality." This also restores the Humean emphasis on contingency between cause and effect, though importantly not *pure* contingency (as the dominant interpretation of Hume in analytic circles would have it). "Causation involves what we call a dispositional modality. Causes dispose towards their effects, where disposing towards something involves an irreducible *sui generis* modality. The modality is something between pure contingency and pure necessity and is reducible to neither." There is also room in this view for a "primitive dispositional modality," through which we (non-specialists) acquire the idea of causation, much like Hume's witnessing a repetition and acquiring an expectation. "Causation is perceivable, we will argue, through our roles as causal agents and patiences, and the dispositional modality is thus known intimately by us." Stephen Mumford and Rani Anjum, *Getting Causes from Powers* (Oxford: Oxford University Press, 2011), viii. For a critical take on Mumford and Anjum's claim that we can perceive causes from our everyday experience of agency see Mark Sinclair's *Being Inclined: Felix Ravaisson's Philosophy of Habit* (New York: Oxford University Press, 2019), chap. 6.

[143] While, as Hume puts it, the "ultimate cause of any natural phenomena" must remain unknown to us, this does not prevent us from "[resolving] many particular effects into a few general causes, by means of reasonings from analogy, experience and observation. But as to the causes of these general causal, we should in vain attempt to discover them ... These ultimate springs and principles are totally shut off from human curiosity and enquiry." Hume, *An Enquiry Concerning Human Understanding*, 32-33.

More generally, Hume tells us that every documented action or event is an engagement with chance, and so it *could* go another way. Shifting a causal argument into a probabilistic framework thus undermines the strict linearity of a causal sequence, separating objective processes from initial conditions and assigning likelihoods to potential outcomes (e.g., "chances"), by concentrating on the possibility that must precede whatever we can measure and name as "actual." Notably, while both realists and interpretivists are critical of "actualism," their criticism does not allow for possibility or probability to enjoy the same ontological privilege as what they call actual or real.

Both realism and interpretivism propose a unique logic to causal arguments, involving structures, mechanisms, and "landscapes of meaning," accessible only to specialists. Probabilism, by contrast, follows Hume (and Pascal) in arguing that causal analysis by human scientists is *not logically different* from causal claims in everyday life. This is one reason (we articulate others further below) why sociologists study pockets of predictability, probabilistic orders, or objective *Chance*, rather than structures, mechanisms, or landscapes of meaning. In this case, foremost among the contributing factors for whatever transpires with measurable regularity must include actors' expectations. These can be maintained by explicit rules, and rule-following; but more frequently the types of order and expected regularity do not find rules as the basis for subjective expectations, at least not for most people.

Max Weber in 1913

On this point, we can turn to Max Weber. Even before Weber identified himself as or began to do what he would consider to be "sociology," he presented a stance on causality that, as we recover in more detail below, is indebted to the philosopher and physiologist Johannes von Kries, a probabilistic reasoner from the late 19th century mostly lost to history. In making these arguments Weber sketches many of distinctive features of a probabilistic sociology, including the formal symmetry between causal claims made in a scientific field and those made in everyday life, and the emergence of orders from action that loops into *Chance*.

Among the presumably infinite number of causal elements, those that we should concentrate on are the ones that are *adequate*; the rest are merely chance causation. Yet to be adequate, it must be possible for the cause in question to contribute to the outcome. These arguments are well-known, but they change in line with probabilistic reasoning.[144] The cause in question, to be adequate, must be *disposed* toward the effect. Weber demonstrates this point with the following example: a mother gets upset with her child and "boxes his ears soundly."[145] The child is taken aback, and the mother is embarrassed. The mother pleads with the child: "I did not mean it." This is not typical of her behavior. The event in question should not change the child's opinion of her.

This example casts particular light on whether the mother is disposed to (or in the habit of) acting in the way that she did. The mother, at least, explains this to her child by referencing the shared history between the two, a history in which "clapping on the ears" is not routine. The mother's argument rests on a disposition: the relationship between mother and child is a range of possibility, and you will not find a similar event. The causation in question, then, is a matter of chance rather than adequacy. While the mother did the clapping, she should not be held responsible for it. And in making such a claim, Weber's example essentially scrambles the distinction between interpretation and probability.

In an important respect, this is, of course, all based on an interpretation, by both mother and child, of their shared history. In this interpretation, however, there is not the same "contingency" as an interpretivist might contend. An accumulated history is not an "abyss" over which a cultural grid must be cast to stabilize perception. Rather, it is a range of possibility and a non-arbitrary perception of probability, or what is just another phrase for *expectations*. While this does not mean that mother and child will necessarily agree on what happened and why, it does suggest that their disagreement will revolve around the difference between chance and adequacy, which is not the same as having two different interpretations of the situation in an interpretivist sense. Was this a chance event or was it adequately caused? Is ear-clapping a potential of the mother?

We could, at this point, turn into good frequentists and try to record the relevant event-history.

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[144] For a discussion of this point see Gerhard Wagner, "The Emergence of Sociology Out of The Quest For Causality: The Case of Max Weber," *Doing Humanities in Nineteenth-Century Germany* edited by Efraim Podoksik, (Leiden: Brill, 2019), 264-279.

[145] Max Weber, "Critical Studies in the Logic of the Cultural Sciences," *Max Weber Collected Methodological Writings*, edited by Hans Henrik Bruun and Sam Whimster, translated by Hans Henrik Bruun (New York: Routledge, 2014), 177-78.

On these grounds, we could put the mother into one or another of our reference classes, allowing for an "objective" assessment of probabilities. But this is not necessary. Weber's point is that we can (and regularly do) assign probabilities to *single* events or cases, because those probabilities don't inhere in events or our calculations—they actually inhere in the *mother* (in this case). Such a statement is more or less blasphemous according to statistical arguments today, in their dismissiveness of anything that rings of "subjective" probability. Yet, this is not a subjective claim. It is linked to expectations, but those expectations are not objectively ungrounded.[146]

The causal agent in question could be a mother; it could be the state. Regardless of how we (nominally) label it, we are referring to an accumulation of history, or more specifically, to a probabilistic order that *can* accumulate history, and this is what fundamentally creates the dividing line between chance (outside the order) and adequacy (within it). For social action to be adequately caused, we must be able to *expect* it. We can only expect it when accumulated history disposes a causal agent toward probable action. Interpretivists are right to claim that realists have a hard time providing a causal account when action is simply theorized as an (actual) outcome of mechanisms. A "force" needs to find a "form" in meaningful action; but landscapes of meaning are only *one* kind of accumulated history capable of giving actors dispositions. The larger point is that only by referencing accumulated history can we identify adequate cause and distinguish it from chance mechanisms. If we cannot perceive dispositions other than through expectations, this also means that this is the most *concrete* way of making a causal claim.

Probabilism in sociology finds its roots in arguments like these, which as we emphasize below, gives Weber, the classical figure with arguably the most influence on both interpretivism and causal theories of mechanisms, a different identity in the field. Probabilism retrieves a vision that Weber gave to sociology. Aside from some daring expeditions, this has remained lost in a remote cavern amid the vast mountains of literature on the German scholar. Weber's 1913 essay "Some Categories of Interpretive Sociology" appears to have had no influence on contemporary interpretivism, even though it marked Weber's initial entry into developing his own sociological project as rooted in probabilism. Below we give some reasons why this consequential aspect of Weber's thought could appear so obscure to contemporary eyes, particularly Anglophone eyes, despite the endless libraries of Weberiana.

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[146] As we will explain in more detail below, there is an alignment here between Weber (via Kries) and Charles Sanders Peirce. We can explain it by accounting for their mutual pivot away from probability as frequency. Peirce essentially began life as a card-carrying frequentist, but he would eventually shift in a more probabilistic direction, particularly in his later period. This means that he located chance in the world, with probabilities consisting in the tendency of things to take habits. This also meant that he tied causation to prediction in a way that mirrors Weber's association of expectation and adequate causation (Peirce made a similar distinction between causation and force). Peirce recognized single-case probability, but could not resolve it given the onus instead on observations in "the long run." See the discussion in chapter 10 below. Charles Sanders Peirce, "The Doctrine of Chances," in *Chance, Love and Logic: Philosophical Essays*, edited by Morris Cohen (London: Kegan Paul, Trench, Trubner & Co, 1923/1878), 61-82; Charles Sanders Peirce, "On the Doctrine of Chances with Later Reflections," in *Philosophical Writings of Peirce*, edited by Justus Buchler (New York: Dover, 1955/1910), 157-174; Charles Sanders Peirce, "Reply to the Necessitarians," *The Monist* 3 (1893): 526-570; see also Hacking, *The Taming of Chance*, chap. 23.

By way of example, the following argument from Weber's 1913 essay, substantive and programmatic though it may be, fits within no contemporary analytic approach in sociology:

> In the construction of general concepts, however, sociology credits actors with an average measure of the capacities required to evaluate those probabilities. That is, sociology typically assumes that objectively existing average probabilities are, on the average, subjectively taken into account by instrumentally rational actors. For that reason, the empirical "validity" of an order shall for us too consist in the objective confirmation of those average expectations (the category of "objective possibility"). Specifically, for us an action is "adequately caused" when, according to the then-current average probable assessment of facts, the action is subjectively oriented in meaning toward those facts. Thereby the objectively calculable probabilities of the possible expectations also function as an adequate cognitive basis for the probable presence of those expectations in actors. That the terminology of the two converges almost unavoidably does not eliminate the logical chasm between them. Only in the first sense, by a judgment of objective possibility, we obviously mean that those objective probabilities (*Chancen*) are suited on the average to serve as meaningful grounds for the subjective expectations of the actors, and therefore, that they actually (in a relevant measure) did so serve.[147]

The exegetical difficulty of passages like this can make it seem like Weber engaging in frustrating wordplay.[148] We quickly lose patience. But in fact Weber here engages in a style of probabilistic reasoning, presenting an argument with surprising contemporary relevance, seeking to orient the sociological project more generally. If realism and interpretivism have sprouted during our present post-positivist moment as attempts to give sociology a new beacon, they are in that sense positioned against sociology's reliance on statistical correlation as a *de facto* part of the project. Weber's argument stakes out similar ground. Rather than deny probability to account for statistical relationships, this approach uses a similar kind of "intelligibility" claim that we might find an interpretivist deploying, though it does not include culture or "subjective meaning" in the uses these concepts typically find in research today.

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[147] Max Weber, "Some Categories of Interpretive Sociology," *Sociological Quarterly* 22, no. 2 (1981/1913): 151-180, quotation is on p. 161.

[148] Alan Sica, *Weber, Irrationality and Social Order* (Berkeley: University of California Press, 1988), 189.

But even in its rightful place among contemporaries, Weber's probabilism does something different from realism and interpretivism. For Weber, "sociology credits actors with an average measure of the capacities required to evaluate those probabilities." On the face of it, at least, this appears to be a different starting point than the assertion that actors have the "same essential capacities for coherent thought and intentional action as the investigator does."[149] Weber maintains that actors have the capacity to *know probabilities*, just as we, the "discerning subjects" (e.g., analysts), do. As we calculate "objective probabilities" we also describe a range of possible expectations. Our probabilistic calculations are therefore not only an epistemological claim, as a realist might object. From those probabilities, we can infer certain "expectations in actors," as our calculation already indicates an "adequate cognitive basis" for those expectations. What we find here is an actor who *loops into* the world based on its probabilities.

Weber gives the example of playing a card game, which might seem surprising to contemporary readers, given that "calculating objective probability" seems like it could *only* convey a statistical task. Yet, Weber departs from the idea that to calculate objective probability means to decipher whether the card players' action features an "orientation to the rules" of the game. This is not something that the discerning subject alone can know: "participating card players 'know' from one another that the agreed-upon rules are no longer being observed." When the players know this, the "order" that is the game dissolves, and we (the discerning, observing analysts) can no longer interpret what these actors do. We can only interpret their action when their "association" in playing the game "exists so long and insofar as action, oriented toward the rules in accordance with their average intended meaning, still occurs within a practically *relevant* range."[150] This means that the rules themselves secure objective probability as a state of the world because the rules can orient action and create a "practically relevant range" of action that can be considered as playing the game. But the rules alone are not enough to account for this order; actors must be oriented to them to maintain, through social action, the order itself, which means that rather than being simply present or absent ("a logically exclusive alternative—continuance or discontinuance of an association"), the order is a "fluid situation." We are not exclusively in action or in social action. We constantly toggle between them, though only social action maintains social orders.

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[149] Reed, "Justifying Sociological Knowledge," 116.

[150] Weber, "Some Categories of Interpretive Sociology," 161.

How sociologists use and refer to "general concepts" is addressed in this passage. Weber's argument about the uses of theory deviates from Weber's reputation as the most individualistic and least systematic of the classical thinkers. Sociology should use and reference general concepts, Weber implies, and sociologists should engage in a general study of social orders, instead of case studies of specific times and places. Jurgen Habermas, for one, finds in the history of sociological theory a history of rationalization: the creation of general, "collectivist" concepts by specialists for solving the "problems of society as a whole … [with] a theory of society."[151] Weber makes a relevant counterproposal: "General concepts" refer to social orders that have the modality of *averagely existing probabilities*, located somewhere between necessity and contingency, calculated by analysts and oriented to by actors. Such a formulation does not exhaust the meaning of these orders, though it does attempt to specify what makes them distinct as "sociological" phenomena.

We expand upon each of these points in more detail below. At this point, we simply want to double-down on the possibilities that this reading of Weber opens. If we are correct, then Weber has no present-day lineage in sociology.[152] His sociological line envisions a probabilism that does not exist in the discipline today, at least not in any drawn out or usable form. Weber's largely unread 1913 essay—we will refer to it as the *Logos* essay after the German-language journal in which it was originally published—is not a strange anomaly in his sociological theory. It was written as a first draft of what would become the first chapter of *Economy and Society*, which includes the same pages that are often referenced to draw Weber into the interpretivist lineage.[153] Yet, reading those same pages in new translation, as we do below, challenges Weber's selection as a predecessor of contemporary interpretivism.[154]

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[151] Jurgen Habermas, *Theory of Communicative Action, Vol. 1: Reason and the Rationalization of Society* (Boston: Beacon Press, 1984), 4-5; see also Stephen Turner, "Defining a Discipline: Sociology and its Philosophical Problems, from its Classics to 1945" in *Philosophy of Anthropology and Sociology* edited by Stephen Turner and Mark Risjord (Amsterdam: Elsevier, 2007), 3-69.

[152] Gerhard Wagner, "The Emergence of Sociology Out of The Quest for Causality: The Case of Max Weber," *op cit.*

[153] Reed, *Interpretation and Social Knowledge*, 188.

From Central Problems to Basic Questions

One legacy of the theoretical upheavals of the past half-century is a general approach to theory, one that gave it a unique problem-set, and justified the work of theorists trying to solve these hard or *central* problems. This still shapes the era, as theory carries with it a mutually recognizable stock of knowledge in the form agency versus structure, "culture in action," "what are institutions and structures?" and the like as central problems with bearing on research across *all* subfields, and theory could find a *raison d'etre* in solving these problems. A central problem requires theoretical attention; it must be resolved conceptually, rather than with better methodology, more data, or perhaps even institutional insulation from ideology and amateurism. One key central problem is given its typical expression by Anthony Giddens.[155] Giddens appears to have adopted a quasi-pragmatist, "problems" focus for reorienting social theory away from the post-functionalist, warring schools of the period immediately before, particularly around the classics, as a (at the time, risky) position-taking for an era of coexistence, synthesis, and fluid adoption of concepts across formerly hard lines to solve central problems.[156]

It worked. In the dualism of *structure versus agency*, theory (and theorists) can identify a "single conceptual move" to solve this as a problem, specifically the "essential recursiveness of social life, as constituted in social practices. Structure enters simultaneously into the constitution of the agent and social practices, and 'exists' in the generating moments of this constitution."[157] Problem statements and solutions like this one, which to an extent still define the landscape of "contemporary theory" though most are verging on middle-age or well into it, assume that there exist purely conceptual problems at stake that data cannot dissolve or displace. The frameworks and conceptual strategies accumulated during these debates over the years provide an extensive archive; yet as a potential source of knowledge capital, promising some hold over an uncertain disciplinary future, have debates over central problems, and the archive of "conceptual moves" they have left behind, run out of steam? Mastery of a central problem carries arguably *less* discipline-wide value today than ever before. With every passing year, a conversation in social theory drifts into the *history* of social theory, coinciding with the diminished occupational niche of "theorists."

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[154] Max Weber, *Economy and Society: A New Translation*, translated by Keith Tribe (Cambridge: Harvard University Press, 2019/1921-22).

[155] Anthony Giddens, *Central Problems in Social Theory: Agency, Structure and Contradiction* (Berkeley: University of California Press, 1979).

[156] For a thorough survey of the history of invoking "problems" to reorient and redefine the practice of philosophy, see Giuseppe Bianco, "The Misadventures of the 'Problem' in Philosophy: From Kant to Deleuze," *Angelaki* 23, no. 2 (2018): 8-30. Giddens might have seized upon a "central problems" focus during his early years at King's College, Cambridge, where philosophers were absorbed in debating the role of problems in "the growth of knowledge." See, especially, *Criticism and the Growth of Knowledge*, edited by Imre Lakatos and Alan Musgrave (Cambridge: Cambridge University Press, 1970).

[157] Giddens, *Central Problems in Social Theory*, 5.

Still, the concepts and frameworks inherited from the central problems debates give sociologists recourse to a conceptual language and frames to generalize research beyond specific cases and about more than data problems. More pointedly, our inheritance from the debates of the 1970s and 1980s supplies resources to meet the challenge posed by data science. In rebuttal, sociology can argue that the discipline is capable of remarkable tricks data science simply cannot do. Sociologists align with cause-and-effect links initiated by structure, for example, they can reveal the special preserve of agency or describe and interpret culture. This is in addition to the variety of middle-range expertises the discipline brings to bear. Yet, within this and not remote from that expertise, is a strategy to inscribe difference (chance) in the identity of concepts, and thus clarify that while data are useful for certain purposes, concepts are not reducible to data, neither are the particularities they reveal nor are the prerogatives of theory.

Cognitively speaking, central problems serve in a similar role as "hyper-priors": an initial, durable knowledge base that maintains itself through the reduction of error. Central problems smooth-over the theoretical world through their repetition, restricting "large swaths of possible hypothesis spaces."[158] Central problems are general enough to draw particulars in as the grounds for making a judgment. Essentially, they absorb the uncertainties and cast aside the residual in whatever stands as "particular" in relation to them.[159] A realist is right to say we have ontological commitments, but this does not mean that our concepts actually latch onto anything "out there." More simply, they diminish the possible with concepts that distinguish the real *from* the possible by situating our analytic attention in the plaster cast of a "central" focus. Notably, this relies on dispossession and a claimed expertise, both between a field and other field (and the outside world) and *within* a field, to use logic and the creation of concepts to take propositions found in ordinary language and scientific pursuits and (re)account for them without contradiction and incoherence. This lends arguments made on the grounds of resolving central problems remarkable longevity and influence,[160] which Giddens himself appreciated as giving social theory (and theorists) a *raison d'etre* both "*après la lutte*"[161] of functionalism and after the contentious knowledge-political position-taking among warring schools in its wake.

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[158] Andy Clark, "Whatever next? Predictive Brains, Situated Agents and the Future of Cognitive Science," *Behavioral and Brain Science* 36, no. 3 (2013): 181-204, quotation is on p. 196.

[159] Pierre Bourdieu, *Classification Struggles: Lectures at the Collège de France, 1981-1982* (London: Polity, 2018/1981-82), 83.

Consider, for example, the following argument from Giddens, which enlists a central problem framework:

> Marx says that workers "must sell themselves"—or, more accurately, their labour power—to employers. The "must" in the phrase expresses a constraint which derives from the institutional order of modern capitalist enterprise that the worker faces. There is only one course of action open to the worker who has been rendered propertyless—to sell his or her labour power to the capitalist. That is to say, there is only one feasible option, given that the worker has the motivation to wish to survive.[162]

Despite the intervening years, this is still not an unusual argument to make. Just observe Vivek Chibber's more recent claim:

> A structural theory does not have to suppress the role of social agency. The challenge is to show how structures are involved in generating reasons for the actions in question. In other words, structures can be causally relevant, not because they turn actors into automatons but because they have an impact on the actors' reasoning about *how* to intervene in the world. They can perform this function because they are part of the constraints actors have to account for as they engage the world around them. Those constraints make it attractive to pursue one course of action rather than another because of the consequences they are able to impose on the individuals

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[160] Just witness the remarkable longevity and cross-subfield hold of Sewell's "duality of structure" argument, cast specifically in the mold of Giddens' central problems. William Sewell Jr., "A Theory of Structure: Duality, Agency, and Transformation," *American Journal of Sociology* 98, no. 1 (1992): 1-29. The irony, of course, is that Sewell is a historian by training.

[161] Anthony Giddens, "Functionalism: *Après la lutte*," *Social Research* 43, no. 2 (1976): 325-66.

[162] Anthony Giddens, *The Constitution of Society: Outline of a Theory of Structuration* (Berkeley: University of California Press, 1984), 177.

> embedded within the structure.[163]

Both arguments, though written years apart, from different positions in the field, fit into a nearly identical dynamic. They make agency and structure appear by contrasting choice against constraint. To allow for patterns and predictability in action, both Giddens and Chibber start with agency, which they associate with choice *a priori*, and then make it intelligible that choices will be one kind rather than another because of the existence of structure. Thus, they use the concept of structure to pick out the real (constrained agency for the working class) from the possible (agency without constraint).

On the surface, this makes good sense, yet a probabilist will interject at this point with an inconvenient *question*: Do we need to attribute "constraint" to structure to calculate certain objective probabilities (e.g., inequalities of income, health, wealth, education) without which we could neither define the structure nor make an inference about its constraint? These calculations are how structure becomes empirically observable to us. However, when we make the leap from these patterns to a structure that constrains, we leave probability behind even though our knowledge of this structure cannot be dissociated from a (calculated) probability. Both Chibber and Giddens make probability strictly independent of action and replicate this in their diagnosis of a central problem (agency versus structure). Probability is appropriated as a route to authoritative knowledge and taken away from actors, who are then assumed to be bad at predicting. But this leads to a similar, retroductive dilemma as noted above: if we need structure to be a constraint to make our knowledge claim work, then structure will be "constraint." If, in the standard, central problem-esque approaches in sociology, the sense of constraint is generally understood to be caused by some sort of structure, then we should question whether this sort of explanation does not reify the very categories that carry the conceptual load, not least by rendering what they refer to as non-probabilistic.

Two further questions can be asked, one using a statistical frame, the other using a probabilistic reasoning frame: Is it class structure that creates analogies from trial to trial allowing for the calculation of probabilities? Is it class structure that actors orient to? A probabilist will answer *no* to both questions, without disregarding what sociologists identify as constraint. Constraint refers to expectations that do not arise *ex nihilo*, but by looping into a probabilistic order. More specifically, constraint is the predictions people make, based on what they can *expect* to happen. Far from creating a strict uniformity, there is guesswork all over the place, as we explore below by comparing fields, apparatus, and games of chance in a typology of probabilistic order. Yet with some possibilities, predictions can achieve near perfect clarity: do what is expected or else face outcomes that are anything but ambiguous. We need to understand what constructs capitalism's range of possibility to make constraint an adequate cause, as this is carried not only objectively (as probabilities that we can calculate) but also subjectively (as what we can expect to happen). But this would require a social theory cast in a different mold than one oriented by central problems and their solutions.

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[163] Vivek Chibber, *The Class Matrix,* (Cambridge: Harvard University Press, 2022), 122-23.

Bruno Latour's Clean Slate

To switch from central problems to more basic questions is to try to theorize outside the bounds of hyper-priors like structure and agency. We can find an attempt to do so in the following exploratory note that features no central problems and attempts to remove all general concepts from view to create a kind of clean slate. Bruno Latour, in one of his early articles, writes as a novice to the sociological field, having a limited orientation to its possibilities (and central problems). He appears to state the obvious, though his naive musings came across, at least to some, as revelatory:

> Sociology had become a positive science only once it stopped bickering about the origins of society and instead *started with* the notion of an all-embracing society that could then be used to explain various phenomena of interest … There is always enough already accumulated energy to explain, say, the spread of multinationals, Pinochet's dictatorship, male domination in Black ghettos, the division of labor in factories, and so on. You start with so many inequalities that their origins seem to be irrelevant. It thus seems unproblematic to say that Reagan, Napoleon, the City of London, or capitalism 'have got power'—unproblematic, that is, so long as you are able to draw on the big reservoir of energy provided by an ever present and overarching society. If you apply the translation model, this reservoir dries up immediately. You no longer have any stored-up energy to explain why a President is obeyed and a multinational grows since these effects are a consequence of the actions of multitudes. You are thus faced with multitudes that wonder how to act as one.[164]

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[164] Bruno Latour, "The Powers of Association," *Sociological Review* 32, no. 1 (1984): 264-280, quotation is on p. 269. Latour (born to the Latour wine family) obtained the equivalent of a PhD in theology from the University of Tours in 1970. He had no prior background in sociology prior to finding his way Côte d'Ivoire to engage in research that would result in "Les idéologies de la compétence en milieu industriel à Abidjan," a report written for the colonial Office *de la recherche scientifique et technique outre-mer*. The report includes (*in nuce*) many of the later themes for which Latour would become

Nothing is central here. No established categories ("power") with their "stored-up energy"; no explanatory privilege. Nothing *has* power; power is instead the *possibility* "of enrolling many actors in a given political and social scheme." This does not confuse the reality of power with its possibility, as power is an effect rather than a cause. More generally, Latour argues, he does not know what society is, and the more telling point is that should he try to give an answer to that question (e.g., society is structure) it will have the effect, as such answers historically always have had, of "holding society together and enrolling enough people to constitute power."[165]

If we refuse to do this, if we (instead) bracket our hyper-priors, then we change our frame of reference. In Latour's case, this leaves him "to wonder" at the basic mystery of it all, rather than ignore the mere "actual" face of the world and attend only to what must be working behind the scenes. Famously, he takes a symmetrical route, and argues that we should collectively reorient sociology from the study of society (in some "central" form) to *the study of associations*. A sociologist should study *all* associations as having equal potential, focusing on "all the forces that have been mobilized in our human world to explain why it is that we are linked together and that some orders are faithfully obeyed while others are not. These forces are heterogeneous in character: they may include atoms, words, lianas, or tattoos."[166] Such a conceptual move drains the "social" of any particular meaning because the social does nothing apart from describing a heterogeneous assemblage of parts. It only appears as the effect of associations. Thus, for a sociology swept clean of structure, what constrains the typical working-class person is not the class structure. It is the "heterogeneous associations" that we *record* as a class structure.

If the search for central problems takes us away from basic problems, for Latour this takes us a step too far. We do not have to drain "social" of meaning. If we do, this opens us up to a certain arbitrariness, not unlike the retroductive problem that interpretivists find in realism. While Latour points out that the "spread in time and space of anything—claims, orders, artifacts, goods—is in the

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famous, particularly the attention he gives to "non-human" agency. There are good reasons to conclude that Latour could not have had these insights had his path to sociology been more conventional. See Jérôme Lamy, "Sociology of a Disciplinary Bifurcation: Bruno Latour and his Move from Philosophy/Theology to Sociology in the Early 1970s," *Social Science Information* 60, no. 1 (2021): 107-130.

[165] Ibid, 270.

[166] Ibid. 277.

hands of people," the study of associations has no way of giving those people a world of their own. It can only observe them from the outside as they "act in many different ways, letting the token drop, or modifying it, or deflecting it, or betraying it, or adding to it, or appropriating it."[167] Any of these actions will appear arbitrary for the sociologist who takes Latour's lead. We can find nothing interior to them, or about those who do them, only what is external. We cannot explain their orientation to the actor-network, such as judging its objective possibility.

Probabilists are not the only ones to notice this. More recently, Isaac Reed has developed an interpretivist framework for the analysis of power, and he does this with an orientation to basic rather than central problems.[168] Like Latour's associationism, Reed focuses on the ties that bind, in this case the lengthy "rector-actor" chains that form collective bodies as formations of power, extending over large expanses and for extended duration. As Reed puts it,

> to accrue agency is to accrue, through *agents*, a distinct increase in the probability of achieving one's projects … The reification of action-reaction flows and the habits that accompany them into networks solid enough to be traced as hierarchical in both position and interpretation is a notification to us that we are dealing with power as a peculiarly important subset of the guide rails for actions and reactions in the world. But this solidity—what sociologists debate as "power structure"— is itself subject to certain temporary rhymes and rhythms, which is to say it always carries some aesthetic, and allows for the possibility of redescription by performance. This is because the navigation of the world requires its signification, which introduces contingencies of interpretation.[169]

This exemplifies a basic problems approach, as it clears the eyes of an (actually existing) structure and dissects it, not unlike Latour, into associations. Yet, while linking those associations together is something that Latour omits from his own basic account, it is something that Reed doubles down on: we can act *"for a project,* and even interpret the individuals and groups of humans who serve as our rectors as themselves allies in, and thus the 'means to,' the accomplishment of a project we value highly and of which we believe we have the best interpretation."[170] Thus, the glue that holds together a collective project, as composed (molecularly) of chains of associations, is *interpretation*.

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[167] Ibid, 267.

[168] Isaac Reed, *Power in Modernity: Agency Relations and the Creative Destruction of the King's Two Bodies* (Chicago: University of Chicago Press, 2020).

[169] Ibid, 32.

[170] Ibid, 33.

Interpretation and judgment might be the same. How is a judgment *not* an interpretation? It is different because being future-oriented, it is equivalent to guessing, giving meaning to the world via typification and classification. The prevailing analytic application appears as a "grid of perception," or "mental schemes" that order perceptions which are arbitrary "from the standpoint of nature."[171] Without a grid, we could not speak of a "world," only unordered chaos. *With* realists, however, a probabilist agrees that this is not the case; the world is mind-independent and "structured" without us. Yet, *contra* realists and *with* interpretivists, to be real as an adequate cause, the world comprises probabilistic orders that require our orientation.

We loop into patterns and repetitions as probabilities; they are *necessarily* contingent to us. Though they are also essentially arbitrary; still, we cannot free ourselves from their grasp. In the same manner, objective probabilities are *contingently* necessary: without our orientation, they could not, as we might say, be *ontic* and present us with potential, causal resistance. Of the many (presumably infinite) causes that may affect what we do, it is the causes that we are oriented to, that we *loop into*, that can be adequate rather than chance.

This, as the probabilist contends, alone moderates causal relationships and the motivation for action. And as it might indicate, the separation of interpretation from probability is hard to maintain when you try to define "interpretation."[172] Our argument is that, in sociology, the interpretation and probability have been artificially separated despite their common (Weberian) birth in the field. Without each other, they have been twisted out of shape, which could recommend that we drop, or at least redefine and retool, the two terms and come up with others. Thus, we start reasoning probabilistically when we make a novel claim like people are oriented to *Chance* as toward objective potentials—real features of their worlds.

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[171] John Levi Martin, *The Explanation of Social Action* (Oxford: Oxford University Press, 2011), 130.

[172] When Reed (*Power in Modernity*, 34) is pressed to define "interpretation," he puts the onus on typification: "In a project, a person or set of persons *projects* into an uncertain future an image of the world; that imagined future becomes part of their repertoire for navigating the present world; attempts to *remake* the world take on a relationship to the project image via interpretation. This process requires a typification of the world as it is. And so the pursuit of a project combines models of the world and models for the world." The interesting part is how this takes on a probabilistic cast, but one that seems to make interpretation essentially a version of probabilism: "We can see discursive power in the naturalization, via various processes of typification and invention, of a set of interpretive tendencies concerning who is a *likely* rector, *likely* actor, or *likely* other given a problem situation, an established process, or a series of linked interactions. Here we find sense and reference, the comprehension of the world as significant by the human subjects who engage each other and form meaningful hierarchies that are both created and justified via signification." Reed, ibid, 64 (emphasis added). On both occasions, Reed cites Jeffrey Alexander's own account of interpretation, which also assumes a distinct probabilism, resting primarily on *expectation*: "By [typification] I invoke the phenomenological insight that all actors take their understanding of the world for granted. They do so because they fully *expect* that every new impression will be 'typical' of the understanding of the world they have already developed … Even if we encounter something new and exciting we *expect* this newness and excitement to be understandable: it will be known by us within terms of reference we already possess. We cannot separate ourselves—except in the fantasy of psychotic experience—from our classification system … Every member of the collectivity must learn to explain, to name, to discover the typical terms of every possible situation. The most basic rule for acquiring sociological citizenship is 'no *surprises,*' and typification is characteristic of the consciousness upon which such inclusion depends." See Jeffrey Alexander, "Action and its Environments" in *Action and its Environments* (New York: Columbia University Press, 1988), 312-13, emphasis added. To the degree that Alexander (and Reed via

From the Study of Associations to the Study of *Chance*

What Latour and Reed, who both showcase the appeal of a basic questions approach, overlook is that associations are not themselves the unit of analysis, should we want to get truly *basic*. That unit is, instead, *objective probability* as Weber first noticed. There is a relevant connection between the study of association and the study of *Chance*, as made clear by field theory, a point we elaborate further below.[173] Consider, for now, one analysis of a field to help demonstrate this point.

When Pierre Bourdieu describes the church's relation to the "religious field," he describes it as the solidification of tensions in the field, particularly between priests and prophets.[174] Priests are those who carry forth an interest in the church tradition because they seek a repeatable and easily transmissible lesson that has duration and does not waiver from generation to generation. This "economizes on genius" because it consists of the routinization of an original message of prophecy. Prophecy becomes exceptional and out of the ordinary when priests make it likely that whoever follows in the wake of prophecy can only claim themselves to be prophets with extraordinary audacity, most likely appearing to others as grandiose dreamers or pure egotists. As experts in a specific

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Alexander) associate interpretation with typification, they appear to inherit what we explain in chapter 4 as Alfred Schutz's reading of Weber's probabilism.

[173] The parallel histories of actor-network theory and field theory is a story yet to be written, but when that story is written, it will include the genealogy of two relative outsiders to sociology in France (Latour and Bourdieu) who had little interest in a "central problems" style approach, fueled in part by experiences with peoples under the lead boot of colonial France (Latour in Côte d'Ivoire, Bourdieu in Algeria). Both Latour and Bourdieu would go on to emphasize a certain reflexivity in the construction of general concepts, all too aware of the force of domination exercised through the medium of authoritative social knowledge. Significant differences persist between the two approaches, as many have emphasized, including Bourdieu and Latour during their own lifetimes, yet at the very least we should appreciate the parallel between what Latour advocates as paying attention to "heterogeneous associations" and Bourdieu's advocacy of field theory that "takes everything into account." Both exemplify a more basic approach. See Julian Go, "Decolonizing Bourdieu: Colonial and Postcolonial Theory in Bourdieu's Early Work," *Sociological Theory* 31, no. 1 (2013): 49-74; Lamy, "Sociology of a Disciplinary Bifurcation."

[174] Pierre Bourdieu, "Legitimation and Structured Interests in Max Weber's Sociology of Religion," in *Max Weber, Rationality and Modernity* edited by Sam Whimster and Scott Lash (London: Routledge, 1987), 119-136.

prophecy, priests are empowered via diminished anomie or dynamism, as when a controlling apparatus replaces a field. That apparatus cannot entirely dictate the range of possibility, however, as there always remains the potential for a new entrepreneur to appear and capture a segment of the laity with a message that seems emboldened and "charismatic," because it takes risks and seems to promise transcendence, at least relative to priest-led dictates that seem unsurprising and uninspired by contrast, and, in the moment, hardly memorable.

Bourdieu describes a field as a structure of positions, but those positions essentially consist of the *tests* they can levy on one another. This is subject to adequate causation: not just anything can be used to gain position in the field. To be a priest is to test a prophet with the authoritative message and legitimation of a religious institution. To be a prophet is to test the priest with the propensities of a fresh new message that can gain a public following. We can also include magicians in the mix as testing both priest and prophet with the potential to work miracles and solve problems with immediate impact. Other actors can try to enter the field, but they will exist as part of it only to the degree that their action serves to test these other parties, whether in one of these established ways or in a new way. Only this will give them *history* in the field. Whatever allows these changes to occur does so by changing what is objectively probable, which will be reflected in the expectations and judgments of those in the field. In a more fundamental sense, they might change the range of possibility that constitutes "religion" or whatever arbitrary entity the probabilistic structure of the field organizes.

Thus, this cultural field does not merely consist of associations or the "structure of relations" between priest, prophet, and magician. What it consists of is a specification of *Chance,* or the objective probability of religion as organized by competing typical actions and adequate causation, which limits (though does not entirely forbid) the *Chance* of orientation to "religion" should that orientation not mirror the probabilities of the field. This allows for the accumulation of only certain history as *religious* history. A religious field serves as an anchor for religious expectations and dispositions, and the action capable of a continuous "making actual" of the very possibility of religious belief.

As we show below, Bourdieu became aware of probabilism after an encounter with Weber's 1913 *Logos* essay, leading to a pivot away from structuralism and toward field theory. More specifically, this meant that field theory would be dedicated to the study of objective probability. A religious field (like any field) features both a probability structure and the evident practices we register empirically as "religion." The two are not independent of each other, and neither is one "more real" than the other.

They are, rather, an analytically constructed *double aspect* that attempts to understand the effects of probability in social life, as it comes into formation as probabilistic order and constructs the range of possibility that constitutes what generalities (like "religion") are. This adds a different type of contingency than the "contingencies of interpretation." It draws our attention to the contingencies of the orders in which interpretation can be the condition for free action as interpretation (typification, strategization) can then be its presupposition because nothing else is. Probabilism shows that we cannot safely assume that constructed orders (like religion, morality, or science) demand no orientation to their *own* potential.[175]

Investigating a Probabilistic Order via Distributions

Bourdieu identifies a religious field by finding a distribution: Positions, occupations, specialties all hanging together. This is typical of field theory.[176] But can it work for any probabilistic order? If the study of chances is to pivot away from the study of associations, then it must work. Take the following effort at conceptualizing a probabilistic order, one which is basic in its orientation. The philosopher Alan Garfinkel gives us a scenario in which a professor grades their class on a curve. As he explains:

> Suppose that, in a class I am teaching, I announce that the course will be 'graded on a curve,' that is, that I have decided beforehand what the overall distribution of grades is going to be. Let us say, for the sake of the example, that I decide that there will be one A, 24 Bs, and 25 Cs. The finals come in, and let us say Mary gets the A. She wrote an original and thoughtful final.[177]

In this case, the order is the distribution of grades and their corresponding probabilities (e.g., one A, 24 Bs, 25 Cs and corresponding percentages). As we can see, this structure is a closed range of possibility: there is not another grade possible, nor is a different distribution possible. As Garfinkel notes, this naturally begs a question about who gets the A and why. Here the explanation is that Mary, the student who received the A, "wrote an original and thoughtful final." Such an explanation, however, takes no account of the probability structure. Perhaps many students wrote original and thoughtful finals, and yet only Mary received the A. More accurately, Garfinkel argues, we should "[point] to the relative fact that Mary wrote the best paper in the class."

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[175] Bruno Latour, "The Promises of Constructivism" in *Chasing Technoscience: Matrix for Materiality* edited by Don Ihde and Evan Selinger (Bloomington, IN: Indiana University Press, 2003), 27-46.

[176] Monika Krause, "How Fields Vary," *British Journal of Sociology* 69, no. 1 (2018): 3-22.

[177] Alan Garfinkel, *Forms of Explanation: Rethinking the Questions in Social Theory* (New Haven: Yale University Press, 1981), 41.

The probabilities here are objective as a feature of the world rather than anything that emerges from an epistemic calculation. There is no other possible distribution than the one the structure allows, and we must keep this in mind if we are to ask the right question about anything that might happen within the parameters of the order. As Garfinkel writes: "In cases like these, the imposed structural conditions radically alter the kinds of explanations we give because they constrain and truncate the contrast spaces," or the difference between what is made real versus what is possible.[178] The "contrast space" for Mary getting an A is Mary getting a B or C, and similarly for each of the other students. It was not possible for them, or Mary, to receive anything but one of these three grades within the predetermined distribution. Importantly, because of this structure, we must appreciate that we are dealing with a fully relational set of empirical outcomes. Mary got an A because John got a B: the two outcomes are not independent. Within this context, Mary's paper was better than John's, which implies that anything truly unique to Mary's paper can only be of secondary importance for the outcome. If her paper was "original and thoughtful" this matters only because it made her paper relatively *better* than John's paper when the professor-judge puts the two side by side and tests them. Thus, the quality of John's paper is not independent of the quality of Mary's. Rather than simply looking at them as two papers, we see them, instead, as two positions in or parts of the structure.

Probabilistically, the relevant features of an order, then, are the available positions, as these indicate a range of possibilities. A probabilistic order renders some things unlikely (and unthinkable), while what is possible within an order is not equally probable. In this specific case, students are not predetermined to fit a given position, yet their position-takings are not independent of others. In this order, the evaluator who makes the assignments of worth becomes consequential for the capital immanent to the order, which acts as a control on the future. The professor decides that originality and thoughtfulness in the written text matters for deciding futures (e.g., who will end up in what position). While all fields feature capital in some form or another, only some will find an evaluator or assignment-maker determining the positions and deciding who will be in them.

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[178] Ibid, 44.

At least in principle, it does not matter who Mary is, that Mary is a "Mary," that she was born to a certain family, that she is Black, or that she is a she. What is relevant for this order is that one A was possible and that, on some metric, Mary was better than (e.g., had more field-specific capital than) other students who had the potential to have received it. The rest of Mary's traits, should they have any bearing on the outcome, are "inessential perturbations" or accidents, or what we can understand as pure difference or chance relative to the probabilistic order and its control on what matters.[179] Not everything is capital, as we explain further below, though a field makes certain traits, qualities, or abilities into capital, and this capital can *accumulate* by making all other attempts (e.g., different traits, qualities, and abilities) to control the future, at least as this constitutes the stakes of the field, relatively improbable. Moreover, "outcomes" cannot be just anything. Specifically, they cannot be anything new. While new people can be found in positions they were not common to before, an entirely new position is, at least in this order, impossible. To create such a position would break or imperil the entire order.

Garfinkel's example shows that we must account for the full range of possible outcomes to explain any particular outcome within the order. This makes our explanations particular to the order they try to explain. If what we are explaining is a probabilistic order, we must know that; otherwise, we will ask the wrong questions. This example shows us that, probabilistically understood, an *order* refers to a range of possibilities and chances that persist and have duration. Beyond this, those possibilities cannot simply be observed from a distance to infer their effect. In this case, the students were *also* oriented to the order, which gave them a fixed sense of what is possible (e.g., there will only be so many

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[179] Garfinkel, *Forms of Explanation*, 30; Luc Boltanski and Eve Chiapello make a similar point this way, drawing a link between test and *justice,* which we expand on further below: "We may no longer examine the strength of money by means of art, or the strength of reputation or intelligence by money, and so on. To be not only strong but also enjoy high status, it is necessary to commit the kind of strength that is appropriate in the test one is submitting to. To ensure the justice of a test is thus to arrange it and control its performance in such a way as to prevent interference by external forces." Luc Boltanski and Eve Chiapello, *The New Spirit of Capitalism* (London: Verso, 1999), 31. Boltanski and Chiapello tend to theorize tests in connection with a "critical capacity," in which case we can only find tests in moments of uncertainty, as part of the effort to resettle them A probabilist identifies tests in the world, as a mechanism that tames chance, distributes individuals, and beyond this, orients them toward probabilities. Nevertheless, the emphasis among both camps is given voice by Boltanski and Chiapello as follows: "The notion of the test breaks with a narrowly determinist conception of the social, whether based on the omnipotence of structures or, in a culturalist perspective, the domination of internalized norms. From the viewpoint of action, it puts the emphasis on the various degrees of uncertainty haunting situations in social life" (30). See also Luc Boltanski and Laurent Thevenot, *On Justification: Economies of Worth* (Princeton: Princeton University Press, 2006/1991), 133; Bruno Latour, *The Pasteurization of France* (Cambridge: Harvard University Press, 1988), 163-64; Gilles Deleuze, *Difference and Repetition* (New York: Columbia University Press, 1991/1968), 207-08.

As, Bs, and Cs). On that basis, they *loop into* the range of possibility and make probabilistic judgments about what is likely to transpire for them given that *this* is the range of possibility. Their experience in the class acts in this way to anchor their judgments, which makes them either more or less *realistic*. Thus, Mary might have anticipated getting the only available A because she had done well in the class before. Because the A seemed realistic to her, she could find the motivation to obtain it; it was not so much of a risk to wager on a future in which she obtains the A. A different story might apply to John, for whom obtaining the only A was not a realistic judgment. He could still have this judgment, of course, but whatever allows him to have it must work against the weight of the past.

Orders, Tests, and Outcomes

Even if the distributions are not as specifically enumerated as they are in this case, we can still find them by tracking the frequency of occurrence and repetition. Even further, if the structure of a grading curve involves the assignment of grades to a final paper, this indicates the presence of a test and what we might call a *test space* in which the experience of tests of one sort or another, whether by design or happenstance, create a trajectory linking a starting point of open possibilities with a point of arrival ("the actual") when those possibilities have become objective to us. This is what allows us to calculate probability to begin with because a test ensures that each statistical "trial" or observation serves to record comparable things. Actors also learn probabilities via tests and trials, which don't have to be as highly formalized as those we typically encounter in an educational setting. They could be what we observe in the religious field, as the potential of different religious practices (prophets, priests, magicians) to win a greater share of a religious constituency.

For a probabilist, a *trial* refers to the resolution of uncertainty through learning that depends on action, particularly action in conjunction with a source of potential resistance that asks us to *try*.[180] This is the most basic engagement with a real but unknowable range of possibility. When we act we, at least initially, "invite chance in," even if this only through engaging in some new part of the world.[181] When we do this, we will encounter things we never could have expected, which allows for learning.[182] Expectations form as a kind of reaction from our having become active; they show how we orient ourselves to *Chance*. We try to push open a door, for example, but there are two stout men holding it shut on the other side. We try to write the novel but cannot keep our character arc very clear. We try to kick the ball into the net, but someone jumps out to block it. These are basic "action-reaction effect flows,"[183] but more than that they are a learning process: they link initial conditions to outcomes via action, which is how we learn probability.[184] If, say, we go to push on the door again, and almost fall through it, we will infer that something (or someone) must have been pushing against it on the other side the first time; both instances are within the same range of possibility rather than completely different tests.

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[180] Latour proposes a similar idea in his *Irréductions* (the second part of *The Pasteurization of France*) in a typically vivid and engaging discussion (155-56); but we pivot from his implicit link to Nietzsche. Tests are not between "wills to power," but between potentials, say the potential of an individual (as habit) and the potential of a field. In this sense, by "trial" we adopt a more *pragmatic* (experimental, statistical) meaning than, say, a juridical or agonistic meaning. This is consistent with a concentration on the "endemic uncertainty of social life," though without implying too much about what a cognition-heavy phrase like "endemic uncertainty" means. See Cyril Lemieux, "Scene Change in French sociology?" *L'oeil Sociologique* (24 May 2008).

As we elaborate further below, trials are sites of *single-case probabilities* like these, and it is only our expectations that keep each trial analogous with others, testing and learning the same range (or *Spielraum*).[185] Any change to the initial conditions could lead to different outcomes, and to our

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[181] Our argument here is informed by the so-called "dark room problem" that arises out of predictive processing,or the question why, if a systemic goal of cognition is to reach a state of non-perception, this does not lead us to enclose ourselves in perception-less environs akin to a dark, sealed room, completely eliminating the presence of error or chance? The quick answer is that there is no reason to think such a "dark room" would not present us with error or perceptions we could not predict. See Karl Friston, Christopher Thornton and Andy Clark, "Free-Energy Minimization and the Dark-Room Problem," *Frontiers in Psychology* 3, no. 130 (2012): 1-7.

[182] Action entails the creation of uncertainty, a suspension of possibilities, a way of "inviting chance in." A duration of time elapses. The situation found at a temporal end is what we can call an "outcome" linked to some temporally prior "initial condition," and it carries a certain objective status to the extent that the initial uncertainty or open possibility is different now, less apparent than it was before; we can expect something of the same initial conditions should we encounter them again. If trials and tests appear ubiquitous, this is not because they necessarily work better than other potential alternatives as ways of handling endemic uncertainty which can be reduced by learning and forming expectations. Predictive processing would suggest a cognitive susceptibility to a trial structure. We cannot help but notice "sensory perturbations" as those elements of our sensory profile that defy our expectation (or, in more "contentful" terms, our predictions). These errors stand out as what we perceive, and we attend to them by either adjusting ourselves to fit with the error or by acting to change states of the world with those errors (like sitting up a little more comfortably in our chair). The disposition involves an enactive engagement with the world that (ultimately) seeks some circumstance in which nothing is perceived, because, we might say, everything is "meaningful" (i.e. expected). We examine this in more detail in chapter 9 below. Our approach here attempts a cognitive social science in the sense suggested by, among others, Maurice Bloch, *Anthropology and the Cognitive Challenge* (Cambridge: Cambridge University Press, 2012), Stephen Turner, "Social Theory as Cognitive Neuroscience," *European Journal of Social Theory* 10, no. 3 (2007): 357-374, and Dan Sperber, "Anthropology and Psychology: Towards an Epidemiology of Representations," *Man* 20 (1985): 73-89.

[183] Andreas Glaeser, *Political Epistemics: The Secret Police, the Opposition, and the End of German Socialism* (Chicago: University of Chicago Press, 2011), 30-31.

[184] Bourdieu, *Habitus and Field*, 133-34.

[185] For more on single-case probabilities, see Mauricio Suárez, *Philosophy of Probability and Statistical*

surprise as our expectations fail; while we have learned the probabilities of a given range, perhaps we have not learned them all. In any case, it might seem like chance has intervened when it should not—typically the door opens fine, at least when our friends are not trying to play a trick on us.

Thus, trials can serve to bind together instances of time, which is essential for learning probabilities. We try in certain ways, in unknown circumstances, and associate instances together. We rely on our expectations by making what we presently perceive similar enough to what we have engaged with in the past to appreciate that it is not unique. Thus, it does not try *us* in the same way at Time$_2$ as it did at Time$_1$.[186] The same is true of statistical probability: this way of experiencing time suggests something quite the opposite of a Babylonian lottery. Here, we presume that the present will be like the past, as the past is where our observations come from. Yet, we must accommodate what a concept like trial draws our attention to: *single-case probabilities* that arise from the potential and range of possibility of probabilistic environments that measurements of past frequencies, because they find probability only in countable outcomes, may have difficulty predicting. We must not consider single-case probabilities random, as our own expectations and predictions would suggest otherwise.[187]

In Garfinkel's example, we find a more refined and controlled kind of trial, specifically as a test, that channels actors into a limited engagement with a small range of possibility, which can be known from the start, and a correspondingly limited distribution of outcomes. Each student can only demonstrate their knowledge and paper-writing skills. The test recognizes no other action, but at least it does allow action to be consequential for outcomes, as not all probabilistic orders do. The range of outcomes are observable from the start in the distribution of potential grades. Adequate cause is highlighted in this testing space: all that matters for bringing about an outcome is the quality of the writing and the knowledge it demonstrates, not the student's gender identity, say, or their family income. The only probabilities we might discern of the initial conditions, then, that should lead us to expect who will get the lone possible A are those that pertain to the actions (writing, knowledge) made

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Modelling (Cambridge: Cambridge University Press, 2020). See also chap 10 below.

[186] This is at the heart of Bourdieu's critique of Bayesianism: "although it is apparently very close to the theory of habitus as the product of conditionings predisposing the agent to react to conventional and conditional stimuli, the Bayesian theory of decision, according to which probability can be interpreted as an individual 'rational degree of belief,' attributes no lasting effect to 'conditionalization' (the assimilation of new information in the structure of belief)." *Pascalian Meditations*, 219.

[187] See especially Alan Hájek, "Fifteen Arguments Against Hypothetical Frequentism," *Erkenntnis* 70 (2009): 211-35.

relevant by the test. This careful determination of adequacy allows for a perception of fairness and social justice.[188] It is harder when the range has not been predefined and we cannot as easily tell the difference between adequacy and chance. An educational test attempts to resolve only certain things that remain unknown about each student. The test presents them with a range of possibilities; some of those possibilities become actual for each student. Certain possibilities will never happen to any of them.

As we examine further below, this particular test gives rise to a certain kind of probabilistic order: an apparatus. This is an order in which action matters, but with such clearly defined and restrictive tests, we are asked to try in very specific ways. Other orders have a wider range of possibility. Fields are more characteristic here. For example, as a field religion might render some things impossible, but the potential of religion can (and will) take shape in ways we cannot presently envision, featuring actors who do not resemble priests, prophets, or magicians. At present, most of those possibilities seem improbable; still, the test of religion, what can and cannot be religious, is a more encompassing potential that allows actors to try in unexpected ways. As a probabilistic order, a game of chance also has certain, restricted possibilities; but because what happens in action seems to have little relation to the probabilities of outcomes, they all appear equally probable. We can try to flip a coin a thousand different ways; none of them will seem to have an adequate link to heads or tails turning up next.

Tests can be deliberately designed to try people in specific ways, then, with a specific mode of striving or trying against a potential source of resistance, to reveal a specific aptitude, competence, or quality in the performance, taking only specific things into account as adequate causes of the outcomes. This shows the presence of rules, rulemaking, and an organizing authority, which constructs the range, defines and authorizes the test, and maintains the order. But there is a further point we can mention on these grounds.

Ultimately any probabilistic social order is rooted in the expectations it creates—the orientation to *Chance* it creates via looping.[189] The educational test *should* test knowledge and effort, but it comes to be expected that the racial identity of those tested, along with their family income, are what it *really* tests. This would entail a very different range: something we can learn through our own experience, or through other means, like tracking and recording general outcomes for the same range, often involving counts of frequency.[190] Rationalization gives a testing space more formality, featuring tests more analogous to the design of educational tests that seek to limit interventions of "mere chance" and accident, and are also of durable consequence.[191] Such an approach means that counts of frequency and statistical analysis, or even data tracking of infinite actions, are simply additional ways of learning about real but unknowable ranges of possibility alongside the equally legitimate learning done by actors themselves, as they engage in their own trials, which in that case takes the form of expectations. This orientation to *Chance* is conceptualized (following Weber) as a judgment of possibility.

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[188] Bourdieu will claim that even tests not so designed and specific can provoke a sense of injustice, particularly when they allow for a perceivable distribution (*Principles of Vision*, 24-25). An example might be giving one's young family members differently sized gifts and watching their reaction to *that* perceivable distribution. It is especially frustrating when this sense arises from a test vis-a-vis an object (a machine, a virus) that will remain entirely mute to our protestations. On this score, see Luc Boltanski, *Love and Justice as Competences* (London: Polity, 2012), 73.

While probabilistic reasoning emphasizes the role of structured social order, it does not also annihilate history or deny any role to the unexpected. This is largely because probabilistic orders are not monolithic; in fact, they cannot be "real" if by this we mean having definite features in and of themselves. Order consists of a specification of *Chance* that can be more or less complete but not entirely random. Probabilistic orders can be more or less extensive and unpredictable, which depends in large part on the role given to chance mechanisms ("inviting chance in") and the degree of codification of tests ("taming chance"). Tests themselves can suppress almost all *Chance*, and in such cases the order will distinguish a rigidity akin to what we describe below as an "apparatus." As in the case of categorical tests, the future-shaping effects of capital, and the range of possibilities created on these grounds, tests may operate strictly in accordance with a specific index, say of one's race or gender identity, with the ambiguities of cues omitted (often by resorting to a crude biologism, indexing only phenotypic traits like skin color).[192] Yet other tests can displace the effect of these by calling out different qualities and revealing different traits, dissolving those otherwise made so prominent in the "absorption of uncertainty," ones that find variation outside these categories and *break* them by creating new groups in new orders.[193]

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[189] An example close to home would be our claims of knowledge. We have certain expectations of what leads us to knowledge. We would like these to be adequate; and besides that, in a disciplinary setting they have to be. Our knowledge *claims* to pass certain tests, which is just another way of saying it can be expected as opposed to having "accidental" origins, rooted in an indistinguishable *je ne sais quoi*. On this point, see Bernard Williams, *Descartes: The Project of Pure Enquiry* (Atlantic Highlands, NJ: Humanities Press, 1978), 37ff.

[190] Charles Sanders Peirce proposes a similar idea in his definition of "potential," which he associates with what is "general." As Peirce puts it, "That which is possible is in so far *general*, and as general, it ceases to be individual. Hence remembering that the word 'potential' means *indeterminate yet capable of determination in any special case*, there may be a *potential* aggregate of all the possibilities that are consistent with certain general conditions; and this may be such that given any collection of distinct individuals whatsoever, out of that potential aggregate there may be actualized a more multitudinous collection than the given collection. Thus the potential aggregate is with strictest exactitude greater in multitude than any possible multitude of individuals. But being a potential aggregate only, it does not contain any individuals at all. It only contains general conditions which *permit* the determination of individuals." As we establish below, Peirce has a hard time accounting for single-case probabilities because he retains this commitment to frequentism: that probabilities can only become clear "in the long run." Peirce, *Reasoning and the Logic of Things: The Cambridge Conferences Lectures of 1898* (Cambridge: Harvard University Press, 1998/1898), 247.

[191] Boltanski and Chiapello describe this in similar terms as a shift from "tests of strength" to "tests of legitimate status," as a historical claim, though in their fundamentals all tests remain tests of strength: "The transition from tests of strength to tests of legitimate status presuppose a social labor identifying and characterizing different kinds of strength, which must be amenable to being distinguished and separated from one another. In fact, to be open to assessment from the standpoint of justice, a test must first of all be specified, to be test of *something*—of this or that, a competition on the running track or in Latin—and indeterminate, open to a confrontation between beings in any respect whatsoever and using any kind of force they choose (which is arguably one possible characterization of violence)." Boltanski and Chiapello, *New Spirit of Capitalism*, 31. See also Boltanski, *Love and Justice as Competences*, 59-60.

Message in a Bottle: A Close Reading of a Few Pages from Pierre Bourdieu

Probabilistic reasoning is not unfamiliar to sociology. In this chapter, we have argued that it is already part of competing schools of thought like realism and interpretivism. They, too, are engaged in explanations focusing on factors that take actions, events, and outcomes out of a chance logic. Yet, when they incorporate probability into their arguments, it is strictly epistemological, which leads them toward overly necessary or overly contingent accounts. The existence and combination of mechanisms refers to objective probabilities disposed in particular ways. The role given to interpretation applies in circumstances where this can create objective probabilities, as in associations that occur together because of an orientation to objective *Chance*. As we have shown, to make probability objective and ontological requires a relation between the potential and the actual as mediated by action. This gives a profound role to expectation and judgment, which because this is denied by both realism and interpretivism (and algorithms), indicates that they are a product of the rigid separation of interpretation from probability, and that they delegate the latter to statistical methods.

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[192] Ellis Monk, "Inequality without Groups: Contemporary Theories of Categories, Intersectional Typicality, and the Disaggregation of Difference," *Sociological Theory* 40, no. 1 (2022): 3-27.

[193] See Jörg Potthast, "The Sociology of Conventions and Testing," in *Social Theory Now*, edited by Claudio Benezcry, Monika Krause and Isaac Arial Reed (Chicago: University of Chicago Press, 2017), 337-61.

Yet, probabilism represents a distinct style with a historical legacy in the field, present from some of sociology's earliest days and traceable to some of its classic influences. A sociology that refuses to sever interpretation from probability without using the latter as a form of authoritative knowledge remains an unexplored terrain. It serves, then, by way of concluding this chapter and charting a course ahead, to dive, if all too briefly, into what is rather like a stream of consciousness effort to grasp what probabilism means, pulling on the thread just hard enough to find their substantial connections, but which are difficult to comprehend because their style seems to defy historically established "good sense" in sociology.

The goal is to read the following effort *mimetically* rather than exegetically. We want to retrace *concepts in formation*, to repeat the sequence of thought. Experiments in reasoning like this one often appear in texts with less polished language and sprawling organization, as language tries to keep pace with thought as it rushes into a vacuum of new possibilities. The following engages in a close reading from a few pages from what, in retrospect, turn out to be seminal pages in the work of Pierre Bourdieu, an intellectual "turning point" in Abbott's sense.[194] The text is drawn from a 1973 article with a grand title ("Three Forms of Theoretical Knowledge") not uncharacteristic for the time, though essentially forgotten today, and written at a time in Bourdieu's own trajectory when he began secretly engaging in probabilism, which he likely encountered by reading the passage quoted from Weber above, and which (in utter frustration, we might imagine) he tried to make sense of.[195]

As Bourdieu would have it, the middle ground between "objectivism" and "subjectivism" is occupied by the study of what happens in practice. And what happens in practice is not purely factual, like the objectivist, or intentional and conscious, like the subjectivist, but is instead *probabilistic* through and through. The realm of practice pertains to things as possible or probable, though what is also indifferent to our thoughts and interests. What this means is that like *ontical* statements, the realm of practice cannot involve statements of true or false; it can only involve judgments of probability. To convert all of this into a usable formula is a challenge. It requires new terminology and new concepts to overcome the lack of language and concepts for a style that refuses terminologies that connote either a subjectivist motivation or an objectivist force. The key Bourdieu arrives at is that, regardless of labels like these, what we are trying to comprehend is the inevitability of being oriented to *Chance*: we cannot *avoid* looping in, hard as we might try.

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[194] On the concept of turning point, see Andrew Abbott. *Time Matters: On Theory and Method,* (Chicago: University of Chicago Press, 2001), chap. 8.

[195] Pierre Bourdieu, "Three Forms of Theoretical Knowledge," *Social Science Information* 12, no. 1 (1973): 53-80.

In the passage in question, Bourdieu proposes the idea that, in practice, we "estimate chances based on the transformation of [a] past effect into anticipated future effects." Our practical responses to situations are "primarily related to a field of objective potentialities." These are defined as "things to be done or not to be done, to be said or not said, which, as opposed to the future as 'absolute possibility', in Hegel's sense, projected by the pure project of a 'negative liberty', has an urgency and a claim to existence excluding all deliberation."[196] The reference to Hegel here is to a passage from the *Phenomenology of Spirit* in which he describes a similar pincer movement between subjectivism and objectivism.[197] To give the outside world a psychological reality, in Hegel's view, is to make psychology the domain of "absolute possibility." So, that, rather than be influenced by the world of objects, and their limited potential, we can instead free ourselves from it entirely. This, in a sense, is German Idealism's break from the limits of Aristotle's view of potentiality; in thought, philosophy can find an ("absolute") unlocked potential in what is currently actual.[198]

Bourdieu balks at this statement. Psychology offers us not this kind of escape from the outside world; rather, it is still characterized by an orientation to objective probability. Thus, as much as we might be able to imagine ourselves being the richest person on Earth, our imagination is still bound by a world in which this is objectively probable *for us*. This is puzzling for those who think of imagination through the dichotomous lens of subject and object because it would seem that anything is possible in the imagination. As Hegel puts it, we either "let the stream of actuality with its flowing influence have its way" with us, or we "break it off and [turn] that stream of influence on its head." The power of subjectivity includes the capacity for complete escape: "what is supposed to have had this influence could very well not have had any influence whatsoever."[199]

To concentrate on practice, however, reveals this to be a misleading statement because as much as we (under the auspices of subjectivism) might want to escape from the outside world into our private Cartesian theater, *probability* still finds its way in. Even here, we can more easily imagine things that are objectively probable for us in the outside world; we can be more motivated by them and, presumably, find them easier to enjoy. Pure fantasies can come to mind, but we cannot hold them in mind very long, unless we are willing to accept that we are imagining an entirely different world from the world in which there are objective probabilities, that is not organized as a Babylonian lottery or game of chance, and that itself takes some motivation to get into.[200]

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[196] Ibid, 64.

[197] Georg Wilhelm Friedrich Hegel, *The Phenomenology of Spirit*, translated by Terry Pinkard (Cambridge: Cambridge University Press, 2018/1807), 179.

[198] See Dieter Heinrich, *Between Kant and Hegel: Lectures on German Idealism* (Cambridge: Cambridge University Press, 2008/1973).

[199] Hegel, *Phenomenology of Spirit*, 179.

Thus, Bourdieu is led to complicate another token of subjectivity, namely that it can create interests, aspirations, or motivations completely freed from a world with objective probabilities, as if anybody could have any interest or aspiration they choose. He instead asks us to "observe the very close relationship between scientifically constructed *objective probabilities* (e.g., opportunities of access to higher education or not museums, etc) and *subjective aspirations* ('motivations')."[201] But this relationship does not arise from what is also given to subjectivity as a unique capacity: namely, the capacity to "consciously strategize," or, for instance, to go to the museum because doing so will improve our chances in higher education. We cannot strategize about something that seems impossible or improbable to us. The statistical measure of probabilities does not describe what the objective world is actually made of but provides a kind of "negative description of the implicit tendencies of the spontaneous strategy or statistics, which they necessarily imply, since they are explicitly constructed against these implicit tendencies (e.g., the propensity to ascribe an exaggerated importance to primary experiences)."[202]

By "negative description," Bourdieu means something like the following: Statistics can reveal the immense gap between possibilities that are conceivable and those that are actually experienced, yet it offers a description of the *ex post facto,* and to assign probability values to things, it implies that what is equally measurable is equally possible. Thus, if we explain probabilistically using statistics, we imply "" direct determination by antecedent conditions," making practice reducible to "pre-established mechanisms." Bourdieu's point is simple: statistics is *not* probabilistic. It does not allow for probabilistic explanation. Statistics is objectivist, instead, because it suggests there must be a reason for why things are the way we have measured them to be; yet, in practice, we know that everything that seems to have a reason to be the way that it is, is actually devoid of any *necessary* reason to be that way. It could (and will) change for no reason apparent to us at all. Bourdieu calls this "arbitrary."

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[200] Not coincidentally, it seems, the author of *The Lord of the Rings* book series, J.R.R. Tolkien, gave a lot of thought to the fantasy genre, and in a little-known essay he insisted upon the fact that true fantasy (or "fairy-stories") must bear "no resemblance" to real worlds and that, to the degree that they could meet this standard, those stories would be successful. A focus on practice would suggest that this might be a good rule of thumb for understanding the appeal of fantasy to an audience, but also makes it seem extraordinary that anyone could, in fact, compose an *actual fantasy.* J.R.R. Tolkien, "On Fairy-Stories," *Essays Presented to Charles Williams,* edited by C.S. Lewis (Oxford: Oxford University Press, 1947), 38-89.

[201] Bourdieu, "Three Forms of Theoretical Knowledge," 65.

[202] Ibid, 65.

It therefore seems absurd *not* to maintain that objectivist statements are really contingent, and to also admit that what they tell us about could change at any moment without any reason whatsoever. That what statistics tells us about does *not* change at any moment whatsoever (we would know it if they did) does not indicate anything objectivist about the world: it only reveals something practical.

> Unlike the scientific calculus of probabilities that is based on the controlled experiments and on data established according to precise rules, the subjective evaluation of a specific action's chances of success in a specific situation brings into play a whole body of semi-formalized wisdom, dicta, commonplaces, ethical precepts ("that's not for us") and, more profoundly, the unconscious principles of the *ethos*, a general and transposable disposition which, being the product of a learning dominated by a specific type of objective regularity, determines "reasonable" or "unreasonable" behavior for any agent subject to these regularities.[203]

Statistics can only tell us about the world by telling us about *this* world of "semi-formalized wisdom." Generally, there are only unequal possibilities in this practical world, and those spaces (casinos, sports, educational tests) that most resemble statistics by having equally possible outcomes that are also equiprobable and restart after each trial to keep the results independent of each other (not allowing the past to dictate the future), are well-known, and known to be exceptional. Statistics can only give us an indirect measure of the way in which probability articulates and is articulated by a set of concrete and embodied practices.

This leads Bourdieu to the following point, bringing the probabilistic loop to bear in a way that mimics Weber's application of the concept of *Chance*:

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[203] Ibid, 65.

> Practices may be objectively adjusted to objective chances without the agents having to carry out the slightest calculation, nor even a more or less conscious estimate of the chances of success: so, it is as if the *a posteriori* or *ex post* probability of an event, which is known as a result of past experience, would determine the *a priori* or *ex ante* probability subjectively ascribed to it.[204]

Thus, if we calculate probabilities *ex post facto*, then we imply that actors act according to these same probabilities, at least if we say that actors are oriented to "objective chance" *ex ante*. But this is deeply paradoxical from the perspective of traditional statistical modeling. How can probabilities exist without calculation? An individual is only one part of a population. How can they "know" probability sans calculation? This is the main confusion when it comes to putting probability into action. It served as a stumbling block for the likes of Alfred Schutz (see the discussion in Chapter 4) who insisted that "subjective probability" could only be a highly variable interpretation, rather than something more like an assessment.[205]

Yet, the paradox is solvable if we recognize that statistics does not measure probabilities, it only calculates *frequencies*. Probability as it pertains to what is neither true nor false and which is indifferent to what we think and want. Thus, statistical calculation does not tell us very much about our interface with objective probabilities. For Bourdieu probability must have a different source beyond what statistical calculation alone, treated as an objective measure, can tell us about.

> Because the dispositions durably inculcated by the objective conditions (which science perceives through statistical regularities as probabilities objectively attached to a group or a class) gives rise to aspirations and practices that are objectively compatible with these objective conditions and, to some extent, preadapted to their objective requirements, the most improbable events are excluded, either without even being examined, as unthinkable, or at the cost of a double negation tending to make a virtue out of necessity by refusing what is anyway refused and loving the inevitable.[206]

Unlike accounts that transform probabilities into "heuristics" or rules of thumb that ease the cognitive load of deciding, adopted to deal with uncertainty, Bourdieu's focus on dispositions is not about dealing with uncertainty. Only rarely do we encounter uncertainty of this kind in the practical world, which reveals the sudden limits in our pre-adaptation; though even then, (in "institutional gaps") it is still possible for probabilistic expectation to lead the way forward. And this is the more general argument that Bourdieu makes: probabilism is the opposite of a static framework. The appropriate image is of a gambler rolling the dice and finding they always turn up the same way. While the gambler can imagine any number of other possibilities, in the end they always get the same result. For us, a universe of possibility constricts into a universe of probability:

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[204] Ibid, 66.

[205] Alfred Schutz, *The Phenomenology of the Social World* (Evanston: Northwestern University Press, 1967/1932), 231ff.

[206] Bourdieu, "Three Forms of Theoretical Knowledge," 66.

> [T]he objective structures, which science grasps in the form of statistical regularities (for example, in the form of rates of employment, of income curves, of chances of access to secondary education) and which confer its *physiognomy* upon a collective landscape, with its closed careers, its 'inaccessible' positions, its 'blocked horizons,' inculcate, through convergent experiences, that kind of 'art of evaluating likelihoods,' as Leibniz puts it, that is, of anticipating the objective forthcoming, in short, that sense of reality, or realities.[207]

Thus, the "sense of reality" is a dialectical relation, but this is not a generic phrase for Bourdieu.[208] Here it conveys a temporal statement or sequence: we roll the dice (present) and presume (future) a world based on what the dice have shown (past) before. The world in question has "objective structures" that statistics can measure. We experience these structures as returns on our dice-throws. Some structures we may never experience; but, more generally, structures exist only in the judgments we make about them (What to do when you get an unemployment notice? Or after you graduate high school? Or when you receive a certain income?). The kind of measurements and variables that sociologists often use (race, gender, educational attainment, income) can only be capable of adequately causing anything if they affect judgments of possibility. Those presumptions are what they have shown us before; they have presented the same or patterned results. Because they do, we assume that the particular situation we deal with is general: it becomes this *kind* or *type* of situation; certain expectations will follow, our action becomes presumptuous.

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[207] Ibid, 75-76.

[208] The dialectic here is not Hegelian in origin, in which case it would reveal something about a "subject making mistakes," but rather more closely coincides with Nietzsche and "the Dionysian couple of chance/necessity." It is only through chance that we access necessity, or by taking a chance that we discover anything "hard." To do this, subjectivity cannot be present, if by this we mean intending and wanting a certain result and doing the equivalent of rolling the dice as many times as is required until we get it. Terry Pinkard, *Does History Make Sense? Hegel on the Historical Shapes of Justice* (Cambridge: Harvard University Press, 2017), 48; Gilles Deleuze, *Nietzsche and Philosophy* (New York: Columbia University Press, 1983/1962), 25ff.

What Bourdieu glimpses here, in faint traces and vague outline, are the basics of a probabilism that, as he would continue to maintain throughout his career, could (and should) be pulled into sociology. As it was pulled in, sociology would become more Pascalian. It would engage in explanations of non-divine orders that make things possible and probable even when they arise unexpectedly and unjustly. Sociology would cast a wide analytic net into this liminal space of things neither fully determined nor entirely random. Sociology, too, would become a liminal—neither interpretivist nor realist—as the study of *Chances*. Probability would not only be a measurement device, but an integral part of a theory of social action. The strangely paradoxical site of loops at the center of this could lend a substantive meaning to that modifier: "*social*." In the worlds so constructed, they are marked, most of all, by a dynamic presence, of looping between subjective and objective, of a non-chaotic objective probability configured subjectively as expectation, of potentials made actual (sometimes in repetitions, of seeming indefinite length) by way of action neither "free" nor "determined."

This is how Bourdieu makes sense of Weber's own message in a bottle, published in 1913 in a cryptic text, but which is, likewise, nevertheless programmatic and agenda-setting, as an attempt to define sociology according to its probabilism. We have attempted to mimic a process of concept-formation here. But concepts, once formed, are just potentials for inference and application; they, too, exist in time and will transmute into other concepts. From Weber to Bourdieu—but what about before Weber? To answer that requires situating "objective probability," or in its meaningful form as *Chance*, in a history of probability that, although non-statistical probability is mostly *improbable* today, shows it was not always so.

Part II: History

Introduction to Part II

Thus far, the argument has proceeded in the register of social theory, based on the idea that data science presents a kind of social theory in covert form. We have argued that data science does have appeal, but not where we might expect to find it based on what is typically said about it. Data science can make the human sciences, including sociology probabilistic. As we have stated, this is a strange claim to make, as in many respects these fields are already probabilistic; yet we can acknowledge that they are and acknowledge that they are not probabilistic in the way that data science is or, more importantly, in the way we recommend. Such an argument raises important questions, particularly if, as we will argue, key figures in the history of social science, particularly Max Weber, W.E.B. Du Bois and Pierre Bourdieu, were all doing sociology as probabilistic reasoning. Why is it only now that such an intervention can be made? Why didn't probabilism arise in sociology *earlier*?

In part 2 of this book, we give a few explanations why. Additionally, we provide a historical view of probability to find a range of possibility for it, even though the prevailing, statistical meaning, monopolized by professional statisticians, remains typical and the most probable reference for "probability." With the advent of data science, this is changing; yet the way it is changing should give us cause for concern, particularly if it means that these changes should end up ramifying through the field of sociology and take only methodological considerations into account, indebted as sociological methods are to statistical practice and certain theories of probability.

To recall the stakes, the following argument peers into the possibilities of a technological future that might, in fact, be our present:

> In the study of reliable processes for arriving at belief, philosophers will become technologically obsolescent. They will be replaced by cognitive and computer scientists, workers in artificial intelligence, and others. Our understanding thereby will progress, but the nature of this understanding will change: computer simulations will replace (a theory presenting) structurally revealing rules with a face validity that people can appreciate and apply. This will be useful to us—machines will be produced to do intricate tasks—but it will not be what philosophers

> earlier had hoped for: rules and procedures that we ourselves could apply to better our own beliefs, *surveyable* rules and procedures—I take the term from Ludwig Wittgenstein—that we can take in and understand as a whole and that give us a structurally revealing description of the nature of rationality.[209]

Here the philosopher Robert Nozick makes a case for what we can now consider to be *algorithmic* reason: rule-bound procedures for "arriving at belief" that is machine-derived and under no obligation to not be opaque to human reasoning. Nozick published these words in 1993, a time when these recommendations were technically unachievable. Is that still the case? An algorithm evolved from machine learning could (presumably) surpass belief-formation that derives ultimately from the all-too-human judgment of a philosopher, or social theorist, particularly if that judgment involves a theory that provides a solution to a problem or makes a prediction about the future.

Still, Nozick's proposal that "artificial intelligence *can be* philosophy"[210] appears somewhat strange if we take the longer view on probability theory, as in at least one of its origin points, probability was not meant to replace human reason with an opaque process; rather, it tried to identify what it meant, or what would be required, to be "reasonable" in a given situation.[211] Far from Nozick and contemporary data science marking a culmination of the development of probability theory, its history is much more muddled, and it finds at least one deviant trajectory, which has been largely forgotten despite its influence on Weber and, through him, Bourdieu. The implications, as we will argue, are considerable.

Aspirational though it may be, what Nozick's argument represents is a development in Cold War rationality and its systematic casting of doubt on judgment as faulty and untrustworthy everywhere outside the realm of personal taste. It should be drawn out and replaced, so this line of argument goes, preferably by rules *qua* an algorithm.[212] The psychologists Amos Tversky and Daniel Kahneman, in a series of co-authored articles published in the early to mid-1970s—for which they would win the Nobel Prize—famously cast doubt on the ability of human actors to make reliable predictions under conditions of uncertainty.[213] Their arguments would eventually provide the foundation for behavioral economics, and its core principle that algorithmic procedures not unlike those recommended by Nozick were needed to overcome a human rationality "bounded" by heuristics and biases that lead "to systematic and predictable errors" in judgment.[214]

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[209] Robert Nozick, *The Nature of Rationality* (Princeton: Princeton University Press, 1993), 76 (emphasis original).

[210] Nozick references Clark Glymour's thesis in "Artificial Intelligence is Philosophy," which advocates for writing a program language that can translate philosophical or theoretical claims into computer-readable terms to allow for machined-aided inferences. Clark Glymour, "Artificial Intelligence is Philosophy," in *Aspects of Artificial Intelligence,* edited by James Fetzer (Cambridge: MIT Press, 1988), 195-207.

[211] Lorraine Daston, "Mathematical Probability and the Reasonable Man of the Eighteenth Century," *Annals of the New York Academy of Sciences* 412, no. 1 (1983): 57-72.

[212] Paul Erickson, Judy Klein, Lorraine Daston, Rebecca Lemov, Thomas Sturm, and Michael Gordin, *How Reason Almost Lost Its Mind: The Strange Career of Cold War Rationality* (Chicago: University of Chicago Press, 2013).

As Tversky and Kahneman tell the story, they were led into this research, in part, under the influence of Paul Meehl's controversial text from 1954, *Clinical versus Statistical Prediction.* Meehl argued that an "actuarial method" of clinical diagnosis of mental illness was preferable to the judgment of clinicians because clinical judgment was more apt to be wrong.[215] Clinicians, despite their expertise, made bad predictions of patients based on clinical evidence. After Meehl, the psychological role given to probabilism was cast under a dark cloud of normativity. It became a focus only because of its contrast with a rational standard, creating a preference for a Nozick-like, algorithmic solution over any reliance on judgment.

A little over a decade after Tversky and Kahneman began to draw doubts on the capacity of human psychology to predict, the French sociologists Luc Boltanski and Laurent Thevenot published an unusual study, one that sought to test the native social knowledge (or "social sense") of members in a society.[216] In one part of the study, they tested how well a member of a society can *guess* the occupation of a mystery person in the society based only on a few clues. What they found runs slightly (but noticeably) askew from Tversky and Kahneman's key findings: some players only needed a few clues to predict the mystery person's occupation with surprisingly high accuracy—particularly for those who were more "ironic" about the "official representations" used to provide an official view of society.[217] Those who were most successful at the game had many things in common: they tended to be women; they tended to experience a "dominated private life" as subject to a kind of arbitrary power and control; and their professional trajectory tended, in some sense, to be a "'bumpy one." Thus, "the best results [were] scored by those groups whose members had, for defensive purposes in the course of an unstable working life, to make the ironic use of interpretation which the game demands."[218] They did much better at predicting than those, including social scientists, whose judgment appeared mostly scaffolded by "state categories."

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[213] Tversky and Kahneman ("Judgment Under Uncertainty: Heuristics and Biases," *Science* 185, no. 4157 [1974]: 1124-1131) give the example of the gambler's fallacy that if, say, a long series of consecutive heads turns up, the tendency is to guess that tails must occur on the next coin flip, even though the chances still remain equal (p. 1124). Representativeness ("in which probabilities are evaluated by the degree to which A is representative of B, that this, the degree to which A resembles B"), availability (to judge "the probability of an event by the ease with which instances of or occurrences can be brought to mind") and adjustment and anchoring ("people make estimates by starting from an initial value that is adjusted to yield the final answer. The initial value, or starting point, may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically insufficient") are all mentioned as potential sources of bias or misleading heuristic. Even "the rational judge," who strives for some external verification of their judgment as "rational," does not perform the judgment effectively, as they attempt to create "compatibility of a set of probability judgments with [their] total system of beliefs" (p. 1130). See also, Amos Tversky and Daniel Kahneman, "Belief in the Law of Small Numbers," *Psychological Bulletin* 76, no. 2 (1971): 105-110; Daniel Kahneman and Amos Tversky, "Subjective Probability: A Judgment of Representativeness," *Cognitive Psychology* 3, no. 3 (1972): 430-454; Amos Tversky and Daniel Kahneman, "Availability: A Heuristic for Judging Frequency and Probability," *Cognitive Psychology* 5, no. 2 (1973): 207-232.

[214] Floris Heukelom, *Behavioral Economics: A History* (Cambridge: Cambridge University Press, 2014), chap. 4.

[215] Daniel Kahneman, Paul Slovic and Amos Tversky (eds.) *Judgment Under Uncertainty: Heuristics and Biases* (Cambridge: Cambridge University Press, 1984), xi. Paul Meehl, *Clinical versus Statistical Prediction: A Theoretical Analysis and Review of the Evidence* (Minneapolis: University of Minnesota Press, 1954).

[216] Luc Boltanski and Laurent Thevenot, "Finding One's Way in Social Space: A Study Based on Games," *Social Science Information* 22, no. 4 (1983): 631-680. Notably, Boltanski and Thevenot had both worked with and been influenced

Boltanski and Thevenot's findings have never been compared with those of Tversky and Kahneman and, fair enough, they were not exactly studies of the same thing. Yet, Boltanski and Thevenot provide ample evidence of a situation in which at least some lay people *can* predict with accuracy, particularly when that prediction can find "objective probabilities" in the causal texture of the social environment (as opposed to in state classifications) and give rise to expectations for those who loop into them, particularly among those who, in a sense, *have* to loop into those chances practically rather than "officially" to find their way around a potentially fraught social space.[219]

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by Pierre Bourdieu during the 1970s, the period when Bourdieu made his probabilistic turn. That relationship had changed by the time they published this study, yet the probabilistic dimensions of Boltanski and Thevenot's later work draws on similar themes, developing (as we would claim) many threads from Bourdieu's own probabilism. Notably, for Boltanski and Thevenot, "uncertainty" is not a *subjective* state. See Luc Boltanski and Laurent Thevenot, *On Justification: Economies of Worth* (Princeton: Princeton University Press, 2006/1991), 350.

[217] Boltanski and Thevenot, "Finding One's Way in Social Space," 671-72.

[218] Ibid, 672.

[219] Boltanski and Thevenot cite the cognitive scientist Eleanor Rosch's early work on the development of classification and real-world categories (see especially Eleanor Rosch, "Classification of real-world objects: Origins and representations in cognition", in *Thinking: Readings in Cognitive Science*, edited by P.N. Johnson-Laird and P.C. Wason, [Cambridge, Cambridge University Press, 1977], 212-222). Notably, they draw from the probabilistic dimension of Rosch's claims about "prototypicality," the frequency of experience and the general perspective that, as Rosch puts it, the "perceived world is not an unstructured total set of equiprobable co-occurring attributes. Rather, the material objects of the world are perceived to possess high correlational structure" (214). Rosch's work echoes certain themes pioneered by post-behaviorist psychologists like Egon Brunswik and Edward Tolman, and the tradition that Brunswik coined "probabilistic functionalism," which similarly focused on organism-environment relations. As Brunswik argued, "the environment to which the organism must adjust presents itself as semierratic [*sic*] and … therefore all functional psychology is inherently probabilistic" (see Egon Brunswik, "Representative Design and Probabilistic Theory in Functional Psychology," *Psychological Review* 62, no. 3 [1955]: 193-217, quotation is on p. 193; see also Edward Tolman and Egon Brunswik, "The

In the following few chapters, we provide a historical and exegetical argument for why a study like the one undertaken by Boltanski and Thevenot, in its novel engagement with probability, not only makes sense and contradicts the replacement of judgment advocated by those who fall more in line with Nozick, Tversky and Kahneman, but can also apply more broadly, to other forms of objective probability, ranging beyond the *Spielraum* (which we explain in the next chapter) of social space and social identity.

Organism and the Causal Texture of the Environment," *Psychological Review* 42, no. 1 [1935]: 43-77). This probabilistic approach allowed psychology to claim "thematic" independence from the physical sciences, while simultaneously aiding in the project of internal disciplinary unification. Notably, probabilistic learning in a "textured" environment, as Brunswik understood it, does not require a probability calculus, as is implied by Tversky and Kahneman and normative models for learning probabilities (namely, the same way statistical methods "learn" them).

Chapter 3 - Prelude to *Chance*

> *I do not believe that this kind of definition is a useful one. The term must be defined with reference to probability, not to what will happen "in the long run"; though there may be two senses of it, corresponding to subjective and objective probability respectively.*
>
> ~ John Maynard Keynes, *A Treatise on Probability*

Histories of probability are generally marked by approaches that either see it either as a kind of contingent outgrowth of several combining factors, which appeared more or less fully formed by 1660 and then underwent a subsequent evolution, or as different practices and concepts that, while related, are less tightly linked within the same trajectory. Among two influential historians of probability, we can see this divergence. Ian Hacking's work is more exemplary of the former camp, while Lorraine Daston appears more amenable to the latter.[220] From her perspective, probability emerged from the historical womb in a different form than as a quantitative methodology rooted in frequency counts, large-N's, and various kinds of predictive analytics. Its "classical" period was not, however, simply subsumed by these subsequent developments and therefore presumably can be of more than a strictly historical interest for us.

Regardless of whether they see continuity or discontinuity, historians of probability agree the horizons of probability extend further and are more diverse than we might imagine if statistics remains our primary reference point. This history shows that probability has been host to a "family of ideas" not commonly associated with it today. It has had significant bearing on signs and sign-reading, on gambling strategy, equity, authority, and on the epistemological differences between subjectivity and objectivity. Probability was a mode of applied mathematics that was not born quantitative and numerical. Its initial stirrings in the 17th century involved recommendations for how to play games of chance according to reason and equity. Legal and moral applications of probability were common, and probability calculations (non-numerical) could be done simply by knowing the rules of a game and assuming that players wanted to win. Probability was only made quantitative and statistical at the end of the 19th century due to factors not original to it, and which coincided with the professionalization of statistics as the practice of "inference experts" whose services were needed in an expanding "empire of chance."[221]

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[220] Ian Hacking, *The Emergence of Probability: A Philosophical Study of Early Ideas About Probability, Induction and Statistical Inference* (Cambridge: Cambridge University Press, 1975: Ian Hacking, *The Taming of Chance* (Cambridge: Cambridge University Press, 1990); Lorraine Daston, *Classical Probability in the Enlightenment* (Princeton: Princeton University Press, 1988).

Our account in this chapter deviates from the historiography because while we agree that this earlier, classical period was followed by something contemporary, we suggest that it was not entirely left behind; it just moved into different channels than what had become the statistical mainstream. The purpose of this chapter is to situate the key idea of *Chance* within this history, as a distinct aspect of probabilistic reasoning and a prelude to the applications of it that follow. This puts early adopters like Max Weber into context and helps account for why the potential sociological application of *Chance* proved so compelling for some and so baffling to later interpreters.

Put simply, if probability and statistics are nearly inextricable now, they were not always so. Probability has not always required frequency counts, nor has it required variable relations or the assumption of "general linear reality."[222] As we will claim, a figure largely overlooked in this history, and who cannot be easily accommodated in much of the historiography, is the late 19th century German physiologist and philosopher Johannes von Kries who noticed persisting logical difficulties in the shift from probability to statistics.[223] Kries provides a touchstone of sorts for envisioning (and recovering) a probabilistic style of reasoning *distinguishable* from statistics. A direct line of influence runs from Kries to Weber and on to Pierre Bourdieu, as we establish in later chapters.

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[221] Gerd Gigerenzer, Zeno Switjink, Theodore Porter, Lorraine Daston, John Beatty, and Lorenz Kruger, *The Empire of Chance: How Probability Changed Science and Everyday Life* (Cambridge: Cambridge University Press, 1989).

[222] Andrew Abbott, "Transcending General Linear Reality," *Sociological Theory* 6, no. 2 (1988): 169-186.

[223] Kries is not alone in finding shortcomings in the rise of statistics and the decline of non-frequentist probability (e.g., probabilistic reasoning). Arguably under the influence of Kries' idea of *Spielraum*, Edmund Husserl argues that "seventeenth century mathematicians" enabled "the theory of exact (quantitative) probabilities" because they were the first to propose that it is "all a matter of establishing a field of equal possibilities in objectively valid ways … and then of referring every completed cycle of weight probability back to this basic field." Edmund Husserl, *Logic and General Theory of Science,* translated by Claire Ortiz Hill (Dordrecht: Springer, 2019/1910-1918), 267. As we will see, this "cycling back" (looping back?) from probability to possibility, is also not only missing from statistical probability, it also resembles what Kries means by *Spielraum*, though Kries defines these as "ontological action-spaces," and so lends a more thoroughgoing objectivity to them, as *existing*. Husserl's argument links his quasi-Kriesian analysis back to people like Blaise Pascal (typically included wherever "seventeenth century mathematicians" are mentioned) though he goes unnamed. Below we touch upon how, likely, Martin Heidegger draws the term *Spielraum* from Husserl (his estranged mentor) but in fact gives it a meaning more akin to Kries (though both are uncredited). This potentially has bearing on the thought of those influenced by Heidegger in their ontological and metaphysical explorations, like Jacques Derrida and Michel Foucault,

To break with the statistical style and its familiar habits demands that we create and legitimize a conceptual space to theorize probability free of what probabilistic concepts and terminologies can, at present, *mean*. Their present meaning does not encompass their full range of possibility, as this includes (e.g., accumulates) more history than just the history of statistics. These additional, seemingly extraneous historical details include the probabilism that informs data science, though it also remains indebted to principles that only apply to probability after the professionalization of statistics, particularly datafication in "large numbers" as a necessary first step. The same is not true, as we will see, for both earlier and more recent purveyors of probabilistic reasoning.

Pascal, Huygens, and Probability: Classical Sources

Among the more remarkable things about the classical probability theorists (including Pascal, Christiaan Huygens, Bernoulli, Leibniz, among others) is that they did not focus on what is, today, generally understood as "probabilities." They were more concerned with *expectations* than with probabilities.[224] Historians generally point to the correspondence between Blaise Pascal and Pierre Fermat between July and October 1654 as the starting point for the history of probability extending to the present. The correspondence was initiated by the Chevalier de Méré and the two questions he posed to Pascal about games of chance. The first question was: "In throwing two dice, how many tosses are needed to have at least an even chance of getting double-six?".[225] Méré thought 24 or 25, but Pascal had little trouble giving specific likelihoods to rolling a double six in this number of tosses. His main confusion with Méré is why he "does not comprehend that a mathematical line is infinitely divisible" rather than finite. Hence, there can only be likelihoods given based on the specs of the game (e.g., 36 being the total number of possible faces on two dice).[226] Thus, Pascal concludes that "if one undertakes to throw double sixes with two dice the disadvantage of the undertaking is 24" (with 24 rolls giving a .491 chance, and 25 rolls giving a .505 chance of a double six).

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though any direct links, through Heidegger, to earlier theories of objective probability remains speculation.

[224] Daston, *Classical Probability,* 21.

[225] Hacking, *Emergence of Probability,* 59.

[226] Blaise Pascal and Pierre de Fermat, "Fermat and Pascal and Probability," translated by Vera Sanford, in *A Sourcebook in Mathematics*, edited by David Smith (New York: Dover, 2012/1654), 549.

The second question was: "Two players, A and B, each stake 32 pistoles [Spanish gold coins] on a three [throw] game. When A has two points and B has one, the game is interrupted. How should the stakes be divided?".[227] The total wager is 64 pistoles, and if the game concludes before three throws, then both players can be certain of retaining their 32. Since player A has won the first two throws, Pascal concludes they should take 48 pistoles (rather than the full 64) and give 16 to the other player. If both players. If player A had won one throw, prior to the game's interruption, and the other none, they should take 44 pistoles and give 20 to the other player.[228] What is notable is how Pascal halves the original 32 pistoles that both players have wagered, which makes his answer different from Fermat's answer to the question. Unlike Fermat, Pascal made a key assumption: that both players had the *same expectation* of winning on the next (aborted) throw. The outcome value of 64 pistoles is not as consequential as what it would be *reasonable* to expect given the rules of the game and how, even if player A has won at least once, they stand to lose it all should the game continue. But as Pascal allows for this expectation, his probabilistic answer becomes less probabilistic. He rests it, instead, on what the players could be certain of, and particularly, what they could both find to be *equitable*, based on their expectations. The Pascal-Fermat correspondence established a "new standard of excellence for probability calculations" that would persist essentially until the early 19th century.[229]

Also persisting is the probabilistic concern with games-playing, as exemplified by Huygen's 14-page tract (arguably the first "textbook" on probability) *Libellus de ratiociniis in aleae ludo* ("The Value of All Chances in Games of Fortune: Cards, Dice, Wagers, Lotteries & etc., Mathematically Demonstrated").[230] In the text, Huygens explicitly sets out to put a "value on Expectation [*sic*]" as this may be "exactly discovered [and] consequently determined." In fact, he claims to make the "value of expectation" quite precise by determining in such scenarios as "if another desired to purchase my Place and Chance, how much I could justly Sell it for."[231] At the foundation of games-playing is a "self-evident truth," according to Huygens, which is rooted in *equitable* expectations: "That my Chance or

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[227] Daston, *Classical Probability*, 15.

[228] Pascal and Fermat, 548.

[229] Hacking, *Emergence of Probability*, 60.

[230] Here we cite the 1714 English translation of Hugyens' text, which had been in wide circulation in its original Latin version prior to this point. While there is no evidence that Huygens met Pascal or Fermet, he was certainly aware of their correspondence, having visited Paris in 1655. Christaan Huygens, *The Value of All Chances in Games of Fortune: Cards, Dice, Wagers, Lotteries & etc, Mathematically Demonstrated* (London: Keimer and Woodward, 1714/1657).

[231] Huygens, *The Value of All Chances*, 1-2.

Expectation to win anything, is worth just such a Sum, as would again procure me the same Chance and Expectation at a fair lay." Thus, as Huygens explains further: "If I expect a or b, and have an equal Chance of gaining either of them, my Expectation is worth a+b/2."[232] More generally, "if the number of Chances I have to gain a, be p, and the number of Chances I have to gain b, be q, supposing the Chances equal; my Expectation will then be worth ap+bq/p+q."[233] All of this is contingent on being able, "by Fair gaming, to procure the same Expectation." For such equitable expectation, the game itself must have been made in a fair way, with all possible success "depending entirely on Fortune."[234]

Thus, drawing from the Pascal-Fermat correspondence and Huygens' treatise on games of fortune, we can find certain key characteristics of what probability looked like prior to becoming tied to statistics and frequency counts. First, pre-statistical probability was essentially the analysis of expectations, or an attempt to summarize what actors can, do or *should* expect under certain circumstances. This put the onus on active engagement in a pursuit involving uncertainty; early on, this revolved around games of chance. Second, probability in this period had an applied focus. Probability could aid jurists in evaluating evidence and testimony, for example, answering the question of how much to weigh a given bit of evidence or testimony in judicial decision-making. It could aid investors in seeking a fair price for an annuity, for a lottery ticket or a partnership share. In particular, probability could aid card players and gamblers as they engage in these games as "chance devices."[235] Third, classical probability drew a close connection between probability and morality, specifically with equity and justice as being rooted in expectation.[236] As Huygens would argue, to play a game of "equitable chance" is to play one that "works to no one's disadvantage."[237] The test of such a game is that every player has the reasonable expectation that every possible outcome *could* happen to every player (themselves and others). For Huygens, the "expectations [are] equal when they could be fairly traded for one another," or sold. Probability does not focus on outcomes or the results of games but on specifying (e.g., "putting a value on") expectations as the starting point for *investment* in games. Thus, probability could help you decide whether to play a game, or at least how much to put at stake to play it.

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[232] Ibid, 2.

[233] Ibid, 5.

[234] The probabilistic enterprise in which Huygens engages might be clarified by the "advertisement" for the book: "As all Mathematical studies are unaccountably bewitching and delightful to those that are once happily engaged in them; so that part which considers and estimates how Expectations of Events that are in themselves uncertain, and depend entirely on Chance and Hazard, cannot fail of giving a particular Pleasure and Satisfaction. To reduce the inconstant and irregular Proceedings to blind Fortune to certain Rules and Limits, and to set a definite Value upon her capricious Favors and Smiles, seem to be Undertakings of so chimerical a Nature, that here is no Body but must be delightfully surprised with that Art which discovers them both really possible, and with a little Application easily practicable." In the "dedication," the application of Huygens principles to physicians and "the Divines" is also emphasized. More generally, "there is but too much of Chance and Uncertainty in Human Constitutions, and the Duration of this mortal Life [and] a proper Application of this Doctrine might assist us to set a true and exact Value upon that uncertainty."

[235] Hacking, *Emergence of Probability*, 44.

[236] This is particularly apparent in Pascal, who "described the results of the new mathematics of chance as rendering to each player what was due to him *en justice*." Daston, *Classical Probability*, 23.

The key ingredients that Hacking credits with the birth of probability are also found in these arguments: an epistemological ingredient, "the degree of belief warranted by evidence," and an aleatory ingredient, "the tendency of chance devices to produce stable frequencies." Probability appears from questions posed to players of games of chance. The answers consist of evidence for forming beliefs and expectations relative to a player's engagement with "chance devices." Revealed in their answers is also the connection between probability and authoritative judgment, as rooted in the resolution of "partial belief" and the reading of uncertain signs.

> A new kind of testimony was accepted: the testimony of nature which, like any authority, was to be read. Nature now could confer evidence, not, it seemed, in some new way but in the old way of reading and authority. A proposition was now probable, as we should say, if there was evidence for it … Thus: to call something probable was still to invite the recitation of authority. But: since authority was founded on natural signs, it was usually of a sort that was only "often to be trusted."[238]

To be "probable" prior to probability was to be believable relative to the testimony of the "best authority" in interpreting signs. Now that authority could be drawn from evidence. Treating "signs-as-evidence" can be found as early as 1650 in Thomas Hobbes' mention of what Hacking calls "internal evidence," as focused on making inferences from "conjectural" signs that can only indicate "more or less … never full and evident" (in Hobbes' words). Signs are indicators of the future, of what has yet to be, of what may or may not come to pass. Probability is linked to sign reading, which is traditionally the preserve of (particularly religious) authority, which itself is never independent of power to resolve the uncertainty of signs and to define what counts as a sign. And yet, while the probabilism of Pascal or Huygens does not rely on the "external evidence" of authoritative testimony, it seems to have conveyed authority, nonetheless.

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[237] Huygens, *The Value of All Chances*, 5.

[238] Hacking, *Emergence of Probability*, 44.

If the classical probabilists focused more on expectations rather than outcomes, it seems reasonable to ask: What *exactly* did they measure? They made recommendations, as we can see, but not as personal advice. Their findings were applicable, especially to games players, but they were not empirical, at least not in any contemporary meaning of the word. Instead, classical probability served as an "index of reasonable belief," and more specifically of the "judgments and decisions of an elite of reasonable men" or *l'homme éclairé*.[239] Probability measures the presence of reason in society, as defined by what those who were "reasonable" would do in each situation of uncertainty. At least in principle, its mission was democratic: "[o]nce codified in mathematical form, good sense could be disseminated beyond the narrow confines of the elite to the population at large, teaching citizens their true interests while consolidating social consensus."[240] Yet, though probability had dispensed with authoritative testimony at this nascent stage, it could still be linked to the fortunes of authority, and used to compel by those believed capable of practical reason because they knew what they could reasonably expect. The "reasonable" *l'homme éclairé* were those who possessed reasonable expectations and could read signs of the future using reason.[241] Thus, it was not uncommon for the classical probabilists to "judge the validity of their mathematical results by the consonance with good sense."[242]

The Birth of Frequentism

In 1837, the French mathematician Simeon Denis Poisson published his *Recherches sur la probabilité des jugements en matière criminelle et en matière civile.* At the start of the book, Poisson insists on the difference between chance and probability: "In ordinary life, the words *chance* and *probability* are almost synonymous and most often used indifferently. However … we attach here the word *chance* to events taken independently of our knowledge, and retain its previous definition for the word *probability*. Thus, by its nature an event has a greater or lesser chance, known or unknown, whereas its probability is relative to our knowledge about it." Hence, the "*probability* of an event is our reason to believe it will occur or occurred."[243] In 1843 the French philosopher and mathematician Augustin Cournot published his *Exposition de la théorie des chances et des probabilités*, which made similar points: "If only we desire to avoid confusion and error … nothing will be more important than a thorough separation of the double meaning of the term probability sometimes understood in an objective and sometimes in a subjective sense."[244] But then Cournot adds, "mathematical probability taken objectively is understood as measuring the possibility of events by coinciding independent causes … Independently from mathematical probability understood in the two senses discussed above there are probabilities not reducible to the enumeration of chances … [T]hey can be called *philosophical probabilities*. All reasonable people have an obscure feeling about these probabilities." And yet, for Cournot, "under the threat of strange corruption," philosophical probability "cannot be included in the field of applications of mathematical probability."[245]

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[239] Lorraine Daston, "Rational Individuals versus Laws of Society: From Probability to Statistics" in The Probabilistic Revolution, Volume 1, edited by Lorenz Kruger, Lorraine Daston and Michel Heidelberger (Cambridge: MIT Press, 1987), 295-305, quotation is on p. 297.

[240] Daston, *Classical Probability,* 108.

[241] Albert Hirschman takes note of the connection between Pascal and Adam Smith (in the *Wealth of Nations*) on a related point, specifically how probability treads on similar ground, and appears to make similar assumptions, as Smith does in deciphering the order and *predictability* of persons oriented by an "invisible hand." Albert Hirschman, *The Passions and the Interests: Political Arguments for Capitalism Before its Triumph* (Princeton: Princeton University Press, 1977), 16.

[242] Daston, *Classical Probability,* 111.

Retrospectively, both arguments have proven to be landmarks in their repudiation of and break from the classical tradition of probability theory. Here we find a language much closer to our own regarding probability. Between Pascal and Huygens and Poisson and Cournot, a few key events happened.

First, the repudiation of associationist psychology, particularly in Etienne Bonnot de Condillac's *Essai sur l'origine des connaissance humaines* written as a supplement to John Locke's *Essay on Human Understanding*, but also departed from it in some crucial ways. For Condillac, "it is not up to the understanding either to perceive or not to perceive ideas and the relations of truth or probability between them. It is not free, it is not even active …".[246] Rather, "the will acts," as manifested in wants and needs. Hence, classical probability makes a large assumption in presuming that reasonable expectations show no variation. On the contrary, "we make different rules of probability according to our dominant interest."[247]

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[243] Simeon Denis Poisson, *Researches into the Probabilities of Judgments in Criminal and Civil Cases,* translated by Oscar Sheynin (Berlin: NG-Verlag, 2013/1837), 31.

[244] Augustin Cournot, *Exposition on the Theory of Chances and Probabilities,* translated by Oscar Sheynin (Berlin: NG-Verlag, 2013/1843), 213.

[245] Ibid, 214.

[246] Etienne Condillac, *Essay on the Origin of Human Knowledge,* translated by Hans Aarsleff (Cambridge: Cambridge University Press, 2001/1746), 97-98.

Second, Jakob Bernoulli in his *Ars Conjectandi* (1713) produced an answer for a question that would prove essential to probability's 19th century turn. Bernoulli assumed that the frequency with which something occurs is known. But how accurate were these frequencies? Do they approximate the probability of occurrence? And do more trials (or observations) make a difference? Bernoulli's solution would be adapted by Poisson and his "law of large numbers," which proved a decisive challenge to any probabilistic statement that did not rest on a foundation of numerous trials (e.g., a large *N*). If, in the application of "the calculus of probabilities to diverse physical phenomena or moral matters, [the] chances will often vary from one trial to the next … in a completely irregular way,"[248] yet if we consider many consecutive trials, then even "blind chance" could eventually be resolved into the "interplay of permanent and variable causes."[249] On this basis, Poisson would state triumphantly: this "universal law of large numbers is … a general and incontestable fact, resulting from experience, which never lies." It must therefore be the "basis for all applications of the calculus of probabilities."[250]

Third, those large numbers became more available with data-gathering efforts ("an avalanche of numbers") undertaken on behalf of various European governments in the interest of biopolitical control, following the population shift from the countryside to the industrial city, the building of great armies, the appearance of new forms of insecurity, all of which provided ample fare for numbering and counting.[251] Statistics on suicide, crime, epidemics, unemployment, workplace accidents, and biological facts of various kinds offered new legibility to society, and all showed "regularities in phenomena." These were unexpected. After all, who could have anticipated the regularity with which murders or suicides occur based on sense impressions and hearsay. This would lead some, like the Belgian astronomer Adolphe Quetelet, to identify the autonomous "statistical fact."[252] According to Quetelet, people have individuality, but "voluntarily give up that individuality to become a fraction of a large body, a people, which has its own life … It is not merely the will of the individual that is found to regulate [statistical facts], but that of the people, in which the individual participates." Statistics made possible a "social physics" in Quetelet's view, based on laws "existing outside of time, apart from the caprices of men." These laws, as revealed by statistical facts, made up their own objective reality "endowed with its own will and habits which are not easily changed."[253] Such laws lent "realism to aggregates"; they made classifications and statistical categorizations convey an objective existence. Quetelet in particular became fascinated by the *l'homme moyen* or "average man" as revealed through the regularities of distribution. In his view, "relying on statistical methods and their totals [had created] a new being."[254]

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[247] Condillac quoted in Daston, *Classical Probability*, 209.

[248] Poisson, *Researches,* 73.

[249] Daston, *Classical Probability*, 285.

[250] Poisson, *Researches*, 37.

[251] Theodore Porter, *The Rise of Statistical Thinking, 1820-1900* (Princeton: Princeton University Press, 1986).

[252] Ibid, 41ff.

Thus, if we could not trust our ability to know probabilities via association, if we should be astonished by what we learn when we have large numbers, and if those numbers are now available, sufficient in volume to defy even our best guesses, then it makes sense why Cournot, writing at the end of these developments, would make a firm distinction between "probabilities that have an objective existence, that give the measure of the possibility of things, and subjective probabilities, which are partly relative to our knowledge, and partly to our ignorance."[255] This marked a radical departure from classical probability, especially its core notion of "reasonable expectation." For Cournot (as for Quetelet and Poisson), such a departure was justified. Between Quetelet's *l'homme moyen* and the classical probabilists' *l'homme éclairé* we can see the difference summarized as probability is reappropriated. On the one side, we find law; on the other side, action. Both *hommes* were mathematically conceived, but only *l'homme moyen* required frequency counts. *L'homme éclairé* was meant to instruct and teach. *L'homme moyen*, meanwhile, served as society's "center of gravity."[256]

Paradoxes and Problems

By the middle of the 19th century, statistical laws began to appear in place of reasonable expectation.

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[253] Quetlet quoted in Theodore Porter, "Statistical and Social Facts from Quetelet to Durkheim," *Sociological Perspectives* 38, no. 1 (1995): 15-26, quotation is on p. 17.

[254] Alain Desrosières, *The Politics of Large Numbers: A HIstory of Statistical Reasoning* (Cambridge: Harvard University Press, 1998), 74.

[255] Cournot, *Exposition*, 212.

[256] Daston, *Classical Probability*, 385.

Enthusiasm rests with *l'homme moyen*, while *l'homme éclairé* has, by this time, been relegated to a curious novelty or even an embarrassment. Remnants of this great shift remain with us, yet this is a narrative of neither progress nor inevitability—irony might be more fitting. Probability was born without statistics and frequency counts; they enter its genealogy as insufficient but make themselves necessary. As probability is appropriated by them, the typical vocabulary with which to speak about probability changed: expectation, equity, and games no longer applied, while law, correlation, and large numbers did. The frequentist triumphalism was short-lived, and for a very particular reason. While frequency counts and statistics seemed to unveil an entirely new reality, it never did manage to hit upon the objective reality of *Chance*.

When the eminent physicist Pierre-Simeon Laplace took on probability in his lectures during the late 18th century, part of them were given over to a discussion of the St. Petersburg Paradox, a kind of holdover from the classical probabilists, but which still had bearing on the emerging frequentism. The Paradox was first proposed by Nicholas Bernoulli in 1713 and demonstrates a classical probabilist's concern with games.[257] The game in question involves a fair coin that will be flipped until it comes up heads the first time. When that happens player A will win $2 from player B with *n* being the number of times player A flipped the coin before it came up heads. We can figure out the outcome values and probabilities of the game as follows. If it takes one flip for the coin to land heads, then player A gets $2.00, if it takes 10 flips, player A gets $2048.00. The probabilities of a coin coming up heads, meanwhile, are ½, ¼, 1/8 and so on. The expected outcome value can be calculated like:

$$\frac{1}{2} \times 2 + \frac{1}{4} \times 4 + \frac{1}{8} \times 8 + \ldots = 1 + 1 + 1 + \ldots$$

$$= \sum_{n=1}^{\infty} \left(\frac{1}{2}\right) n \times .2n$$

$$= \infty$$

The question Bernoulli asks is how much should this game be worth to us? In other words, what amount of money would it make "good sense" for us to accept rather than play the game based on the reasonable expectation we can have of it? Should we try to answer, this we come face to face with a paradox, at least relative to reasonable expectation. Because there is a non-zero possibility that, even on an infinite number of flips, a coin *could* turn up heads on the next toss, reasonable expectation would lead us to accept *no* amount of money rather than play the game. The price of the game, for us, should be infinite. Should the game be played according to what reasonable expectation demands, player A's "expectation value" is infinite. Player A would, in other words, have to ask for an infinite amount of money *not* to play the game based on what they can reasonably expect of the game. Yet, to say that it is reasonable to give up even $1 billion to play a game of chance in which winning is no guarantee seems, at the very least, a counterexample to reasonable expectation. According to reasonable expectation, we should give up $1 billion just to play the game once, and yet (paradoxically) doing so is not reasonable.

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[257] "[W]hat is the expectation of B … if A promises to B to give him some coins in this progression 1, 2, 4, 8, 16 etc. or 1, 3, 9, 27 etc. or 1, 4, 9, 16, 25 etc. or 1, 8, 27, 64 instead of 1, 2, 3, 4, 5 etc. as beforehand. Although for the most part these problems are not difficult, you will find however something most curious." (N. Bernoulli to Montmort, 9 September 1713)

For Bernoulli's cousin, Daniel, the answer to the paradox rested in "moral expectation" of a very specific kind. Players A and B would both play the game based on each player's *expected utilities*.[258] Thus, if A found a utility-value in $8.00, they might give B $4.00 to play on the expectation that they could reach $8.00 and then call the game. The same would hold for B under their expected utility. For the physicist Jean d'Alembert, this solution was also inadequate, however, because the real problem lies in using mathematics to explain what was, fundamentally, a physics problem. It was impossible for A to gain an infinite amount or B to demand an infinite amount to play because it was *physically* impossible for a flipped coin to land heads or tails many times in a row. The paradox simply confused "mathematical and physical possibility, which brought its results into conflict with prudence."[259]

For Laplace, the Saint Petersburg Paradox and classical probability more generally showed that probability was a subjective construct simply indicating a lack of knowledge of true causes.[260] With sufficient knowledge, we *could* know what would happen in the next instant. We could know, for instance, whether a coin flipped will be heads on a specific number of flips. The coin flip game is not probabilistic, then, which means that it is not a game of chance. The success of player A or B is not due to fortune alone because the chance the coin could turn up heads on the next toss is not probabilistic. If a player had more knowledge, they could know how many tosses it would take for the coin to come up heads. The idea that it is reasonable for them to give up any amount of money to play would, then, simply be a figment of our ignorance.

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[258] Daniel Bernoulli's answer has later been claimed as a precursor of contemporary utility theory in economics. See Kenneth Arrow, "Alternative Approaches to the Theory of Choice in Risk-Taking Situations," *Econometrica* 19, no. 4 (1951): 404-437.

[259] Daston, *Classical Probability*, 81.

[260] Pierre Simeon de Laplace, *Théorie analytique des probabilités* (Paris: Courcier, 1812), 439-40.

The point of dwelling on the Saint Petersburg Paradox is that it lays the grounds for a second act in the revolution of probability in the 19th century, based on a revelation of *Chance*. If the Paradox seems to press "reasonable expectation" to its limits, it also seems to pose a dilemma for statistical fact and the law of large numbers. Each time we flipped the coin 100 times, we could not be certain that it would *not* come up 100 heads or 100 tails. Particularly because we are concentrating on instants, there does not seem to be a statistical fact that we could rely upon, except if we want to count the non-zero possibility that the coin *could* come up heads on the next toss. Barring the attainment of total knowledge (as in Laplace's vision), we simply must live with uncertainty. The Paradox will remain a paradox. Thus, if we follow either the classical probabilists or the frequentists, we do not know *where the chances are* if we cannot find them in either reasonable expectation or statistical fact.

Taming Chance in the 19th Century

In the later parts of the 19th century, the next act comes in the form of recognition of the inevitability of chance, found across multiple fields imprinted by frequentism. The world came to seem like a chance world. "Where in 1800, chance had been nothing real, at the end of the century it was something 'real' precisely because one had found the form of laws that were to govern chance … [This] culminates in a metaphysical revolution."[261] The closest analogue to pure chance for the classical probabilists was likely Boethius, the Roman senator at the end of the empire who met with a harsh fate, arrested on false charges and eventually executed. In prison, he would write *The Consolation of Philosophy* and propose the "wheel of fortune" that spins eternally, wrecking our best laid plans or rewarding us for no good reason; but, at least, it made *anything* that happens a "real potential" of the spinning wheel.[262] This was the sort of *fortuna* that Machiavelli later (especially in his *Discourses on*

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[261] Ian Hacking, "How should we do the history of statistics?" in *The Foucault Effect* edited by Graham Burchell, Colin Gordon and Peter Miller (Chicago: The University of Chicago Press, 1991), 185.

[262] Boethius, *The Consolation of Philosophy* translated by David Slavitt (Cambridge: Harvard University Press 2010/524), see especially p. 29-30. Determinist theologians, like Jonathan Edwards, despised Boethius because he

Livy c. 1517) went to great lengths to describe, warning republican governments of its curse, and providing an early (though loose) analogue to probability in the process.[263] Yet concepts of this sort did not motivate the calculus of probabilities by Pascal and Huygens, nor did they play a role in Poisson and Quetelet distinguishing objective from subjective probability. With problems like those posed by the St. Petersburg Paradox, something was missing in both the classical and frequentist frameworks. What was "reasonable" from a probabilistic standpoint? What did frequencies count and statistical laws measure?

The chance world helped resolve some of these dilemmas by making reasonable expectation and statistical law less *sui generis* than they had been assumed to be, and more of a secondary signal. In other words, chance could not be *sui generis* reasonable; it had to be *made* "reasonable." Statistical facts "tamed" something else; they were not *sui generis* facts. Reasonability and statistical facts were indicators, then, rather than standalone phenomena. Thinkers as different as Nietzsche and Peirce provide insight here by offering a metaphysical glimpse of the universe *as* chance. Closer to home, Emile Durkheim also sensed what was needed as he envisioned what the field of sociology could be. In his pioneering work *Suicide*, he argues:

> Without wishing to raise a question of metaphysics outside our province, we must note that this theory of statistics does not deny men every sort of freedom. On the contrary it leaves the question of free will much more untouched if one made the individual the source of social phenomena. Actually, whatever the causes of the regularity of collective manifestations, they are forced to produce their effects wherever they occur, because otherwise these effects would vary at random, whereas they are uniform.[264]

Durkheim's use of statistics in *Suicide* is an important predecessor for best practices in contemporary sociology. But here Durkheim glimpses the limits of Quetelet's "statistical facts" by suggesting that statistics are indicators of an organizing force that has the effect of making uniform what would

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"acknowledges both the limitations of our perceptions of structures and systems and the hopeful possibilities that might lie in not knowing—yet always seeking to know—what could lie beyond them." Seeta Chaganti, "Boethian Abolition," *PMLA* 137, no. 1 (2022): 144-54, quotation is on p. 145. We return to a discussion of Boethius in the Epilogue.

[263] Hannah Pitkin, *Fortune is a Woman: Gender and Politics in the Thought of Niccolo Machiavelli* (Chicago: University of Chicago Press, 1984), chap. 6; J.G.A. Pocock, *The Machiavellian Moment* (Princeton: Princeton University Press, 1975), 156ff.

[264] Emile Durkheim, *Suicide: A Study in Sociology* edited by Steven Lukes (Chicago: The Free Press, 2014/1897), 325.

otherwise be random. If this force is "inherent in individuals, they must therefore inevitably determine their possessors … But it is not so if the stability of demographic data results from a force external to individuals. Such a force does not determine one individual rather than another. It exacts a definite number of certain kinds of actions, but not so they should be performed by this or that person."[265] The focus on this argument is not altogether dissimilar from Peirce's insight about "absolute chance in nature" and the kind of sequence and priority relation found in the phrase that "Chance is First, Law is Second, and the tendency to take habits is Third."[266] Likewise, we can know chance only by comparison with order, whether as "the regularity of collective manifestations," "habit," or what Nietzsche referred to as "purpose" that appears from combinations in the "dice box of chance."[267]

It is here, we argue, in these insights and gestures, which go beyond both frequentism and classical probability, that strong probabilism takes its roots. Yet, each of these answers, while helpful, have not been as directly influential in shaping probabilistic reasoning in sociology in comparison to another more obscure source who, with some exceptions, remains mostly unknown in the history of probability. This includes a terminological change, a new word and a new idea that, we argue, is distinct to probabilistic reasoning: not chance alone but *Chance* itself, a proper noun and analytic term to secure something real and knowable, but only via its opposite.

Enter Kries

Johannes von Kries is an anomaly for the contemporary field of probability, though he is less an anomaly historically. On the one hand, he is considered one of the most original, sophisticated, and influential voices in the nineteenth-century discourse on probability, with some noting how "[h]is contributions achieved…arguably [the] most important clarification of the concept of probability that was put forward in the second half of the 19th century,"[268] and ""the most philosophically interesting

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[265] Ibid, 325.

[266] Charles Sanders Peirce, "The Architecture of Theories," *The Monist* 1, no. 2 (1891): 161-176, quotation is on p. 175.

[267] Friedrich Niezsche, *Daybreak: Thoughts on the Prejudices of Morality* translated by R.J. Hollingdale, (Cambridge: Cambridge University Press, 1997/1981), 81; Gilles Deleuze, *Nietzsche and Philosophy* translated by Hugh Tomlinson (New York: Columbia University Press, 1983/1962), 26.

[268] Bernd Buldt, "Johannes von Kries: A Bio-Bibliography," *Journal for General Philosophy of Science* 47, no 1 (2016): 217-235, quotation is on p. 227. More recently, Kries has come to attention and been subject to a kind of retrospective (e.g. issue 47, vol. 1 [2016] *Journal for the General Philosophy of Science* dedicated to analysis of Kries).

German work on probability during the nineteenth century."[269] On the other hand, Kries's work remains relatively unknown today and is largely misunderstood; Kries "remains today overall one of the least known and most underestimated contributors to the foundations of mathematical probability."[270] As we will see, a lot of this has to do with the difficulty of fitting the Kriesian approach to probability to the standard analytic categories touched upon earlier: specifically, probability as either "subjective" or "objective," and modality as constituted either by pure necessity or ungrounded possibility.

Kries, a relative outsider to probability—he was a Professor of Physiology at Freiburg and noted devotee of Helmholtz—and far more of a practitioner than theorist, saw a field in disarray. Statistics was in the midst of professionalizing, claiming expertise in a wider range of pursuits on the grounds of frequentism, though probability of this sort remained plagued by logical problems, as George Boole and Bernard Bolzano had noticed earlier in the 19th century.[271] In retrospect, Kries proposals fall far outside the range of accepted principles, though for a time, they enjoyed an audience among figures as varied as Hans Reichenbach, John Maynard Keynes and Ludwig von Mises.[272] If Kries is mentioned at all in the historiography, it is mostly to emphasize his distinction from a developing mainstream at the end of the 19th century. Yet, a few scholars still recognize that, in 1886, Kries published a key treatment on probability before frequentism finally did become authoritative discourse: his *Principien der Wahrscheinlichkeitsrechnung. Eine Logische Untersuchung* [Principles of Probability Theory: A Logical Investigation].[273]

Kries's treatment of issues in probability theory still seem unusual in the present, mostly because the *Principien* is a philosophical and conceptual engagement, offering few formulas and no frequency counts. Instead, Kries sought to probe what he called the "logical foundations" of probability. As he recognized, "probability" was quickly becoming identified with "objective probability"[274] in its frequentist mold, so he began the book with an all-out assault on the idea that "that a probability statement summarizes past observed frequencies."[275] In this way, we can appreciate his heterodox claims as a kind of rearguard assault on the foundations of that emerging paradigm, with the effect of keeping "probabilistic calculations" in fields frequentism would render non-probabilistic, while also questioning central criteria of faith among the frequentists. How can we know that the trials we count are not independent of each other? How can we assign a probability value to numerous trials without assuming a range of possible outcomes, at the very least cases where X happens and where it does not? Doesn't this mean there must be an objective basis for our expectations that is distinguishable from the number of trials we observe? Probability statements stand in need of something more than and irreducible to frequency counts, regardless of how many we have.[276]

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[269] Hacking, *Taming of Chance*, 237.

[270] Zabell, Sandy. "Johannes von Kries's Principien: A brief guide for the perplexed." *Journal for General Philosophy of Science* 47, no. 1 (2016), 132.

[271] Gigerenzer et al., *Empire of Chance*, chap. 3.

[272] On the connection between Keynes and Kries, see Guido Fioretti, "John Maynard Keynes And Johannes Von Kries," *History of Economic Ideas* 6, no. 3 (1998): 51–80

[273] Johannes von Kries, *Principien der Wahrscheinlichkeitsrechnung. Eine Logische Untersuchung* (Freiburg: JCB Mohr, 1886). As Fioretti notes, Kreis' book "must have enjoyed a wide following after its first publication in 1886, if in 1927 a reprint was necessary." Fioretti, "John Maynard Keines and Johannes Von Kries," 53.

Kries is clear on these points early in the *Principien*. No one expects the "certainty of hope, blessedness, favorability, or timidity, or unfavorable chances [*Chancen*]" and whether they are "actually something good or bad," to be determined by a frequentist "probability calculation" [*Wahrscheinlichkeit-Rechnung*]. Nevertheless, these experiences are probabilistic nonetheless, as they consist entirely of the "certainty with which anything could be reasonably expected."[277] For Kries, these *non-numerical probabilities*, based on inexact analogical correspondences between past and present cases, are something eluding even the most astute frequentist. Not only for what we might register as a lived experience of hope or dread, but "that 'more reasonable way' [*veruntunger Weise*] which goes into the explanation [must be] included in the probability theorem." This "more reasonable way" does not refer to something in a "practical ethical sense … practical rules are far too subjective and arbitrary to consider for the task of probability calculation." Rather, it signifies, according to Kries, "expectation rules" [*Erwartungs-Regeln*] that are *logically* implied by anything we can legitimately call "probabilistic."[278]

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[274] Kries, *Principien*, i-ii.

[275] Zabell, "Kries's *Principien*," 136.

[276] As Zabell puts it: "No one doubts, for example, that it is equally likely that the two sequences 123456 and 654321 are equally likely to occur in six throws of a die, but this is not based on past observation; or that a probability of one means something other than that repeated trials have only come out one way in the past." Ibid, 136.

[277] Kries, *Principien*, 4-5.

[278] Ibid, 6.

How we acquire expectation rules does not have to be a formal process akin to hypothesis testing, although in certain instances it could be. The larger point is that hypothesis testing is not the only form of expectation rule, as frequentism might lead us to believe, and for Kries, this goes further. It also serves as an indictment of what frequentism assumes is necessary to reveal "objective probability" and predict based on partial belief. This involves a form of probability *learning* distinct from learning via frequency counts, numbers of observations or tests: namely, learning via *analogy*:

> If under certain conditions we observe the occurrence of some fact, and, then, in direct reference to that experience, under conditions that we find to be similar to the previous ones, we expect the same course of events, we draw an analogy. Since this analogy is based on recalling cases already observed that are similar to a present one, it is obvious that its validity increases with the number of these cases, but also that it depends in some non trivial way on the grade and kind of similarity of the past cases with one another, as well as of the past cases with the present one.[279]

To transpose expectations between analogous situations is to arrive at certain expectation rules that can make it possible to *expect* "the more reasonable way."

Kries claims that expectation rules are "just more or less probable," though being probable does *not* mean they can be "expressed numerically." Neither, for that matter, should we invite the "free formation of expectation," which would only apply to "indifferent relationships without scopes of play" or without *Spielraum*.[280] While the "probability of an outcome increases with the number of cases that have come to be known … [This] depends on the grade and kind of similarity of these cases, and especially on the similarity between the case the current expectation refers to, and the cases that occurred in the past. But there is no reason to assume that the [similarity] assumptions have the same value."[281] Kries reiterates the limits of frequentism and "objective probability," and the assumption that the cases counted *are* similar enough as data points to give probability a numerical expression. What Kries critiques here is effectively the transformation of *expectation* into quantitative data.

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[279] Ibid, 16.

[280] Fioretti rightly characterizes the *Spielraum* idea as Kries' "most original contribution to probability theory." Firoretti, "John Maynard Keynes and Johannes Von Kries," 53.

[281] Kries, *Principien*, 26.

From Bayes to *Spielraum*

As this might indicate, Kries had much to learn from the 18th century probability theorist Thomas Bayes, which Kries[282] himself admits, particularly from Bayes' text *An Essay toward Solving a Problem in the Doctrine of Chances*.[283] The Bayes theorem has been revitalized by the availability of data on scales unimaginable before, as limitations here had proved a historic restriction to its adoption as an alternative to frequentism.[284] The basics of the theorem are simple enough: probability is an algorithm combining prior experience (prior belief) with current evidence. Thus, if a sonogram shows that twin boys will be born to a couple, and we want to know whether they will be identical or fraternal, we can use the prior knowledge that identical twin boys are twice as likely to appear on a sonogram and combine it with this current evidence, namely the sonogram showing twin boys and the 50/50 chance they will be fraternal rather than identical. With Bayes, and with no more frequency counts than these, this would yield an accurate estimate: we have no more reason to believe that the boys will be fraternal than they will be identical. The odds are even. Frequentism, by contrast, "rejects the use of uninformative priors" in favor of model-building; optimal estimators are those that perform best in the "hypothetical repetitions" of an experimental setup.[285]

The breakthrough Bayes makes, in his own words, is to turn chance *into* probability: "By *chance* I mean the same as probability." Bayes thus makes expectation, or the contribution of prior belief, a necessary *a priori* for any probability calculation: "The *probability of any event* is the ratio between the value at which an expectation dependent on the happening of the event ought to be computed, and the value of the thing expected upon its happening."[286] This gives chance not an objectivist-frequentist connotation of random, unmeasured (perhaps unmeasurable) error, which eludes model-fitting, but a more subjective connotation akin to "reason to believe." As this might suggest, the validity of the Bayesian theorem and its applicability turns almost entirely on the quality of the prior belief, whether it is "informed" or not, or whether in data science terms, it includes enough parameters, making it "large" enough.[287] And this is where Kries joins the conversation.

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[282] Johannes von Kries, "Ueber den Bergriff der objective Moglichkeit und einige Anwendungen desselben," *Vierteljahrsschrift für wissenschaftliche Philosophie* 12 (1888): 179-240, 287-323, 393-428, see p. 188ff. In English translation: "On the concept of objective possibility and some applications of it." The three parts are entitled: 1 "On the concept of causal connection: concrete and abstract causal connection." 2 "On the concept of danger." 3 "Literary notes."

[283] Thomas Bayes, "An Essay toward Solving a Problem in the Doctrine of Chances. By the late Rev. Mr. Bayes, F. R. S. communicated by Mr. Price, in a letter to John Canton, A. M. F. R. S," *Philosophical Transactions of the Royal Society* 53 (1763): 370-418.

[284] Some have remarked upon the political data analyst Nate Silver's 2012 US presidential election predictions which used Bayseian principles to correctly predict the electoral vote in all 50 US states, far outperforming political punditry or polling. Silver could do this by pulling together a mass of "background information" which he could condense into the equivalent of prior belief and then hypothesize the effect of "current" or new evidence, essentially in real-time. This method has since been mimicked in all subsequent elections (spectacularly failing in the 2016 US presidential election, according to some). See Sam Wang and Benjamin Campbell, "Mr. Bayes Goes to Washington," *Science* 339, no 6121 (2013): 758-59.

[285] Bradley Efron, "Bayes' Theorem in the 21st Century," *Science* 340, no. 6137 (2013): 1177-1178; see also Scott Lynch and Bryce Bartlett, "Bayesian Statistics in Sociology: Past, Present and Future," *Annual Review of Sociology* 45: 47-68.

For Kries, the quality of that prior belief, which as Bayes recommends can be entirely inductive, rooted in non-numerical, individual experience, is not a metric suitable to counting or quantification. It indicates a subjective (judgment) of probability that, rather than based on frequencies or anecdotal evidence, loops into (or does not) what creates the range of possibility within which trials become comparable enough to allow for a "probability calculus."[288] For Kries, Bayes' theorem is *too* subjective because it generally assumes that prior belief is equivalent to prior (unique) experience. Present-day Bayesianism only rectifies this with "big data" as essentially a frequentist supplementation. Yet even as it allows for "prior belief," Bayesianism in any form has a faulty understanding of what the quality of prior belief indicates, something which makes it far less subjective, on the one hand, and unable to be quantitatively solved, on the other. Kries gives the following example as a demonstration.

> If we find, for example, that fewer people die on average from pneumonia if treated with cold baths rather than those treated indifferently, and conclude from this that the former therapy has considerable influence on the course of the disease, then the justification for this conclusion rests at least in part on the fact that, on the basis of this assumption, there corresponds a far greater range of real behavior [*grosser Spielraum realen Verhaltens*] to actually observed events than the contrary, which declared the phenomenon in question to be accidental. Consistently, therefore, we regard an assumption of nomological content as recommended by presenting actually observed behavior as corresponding to a very large circle of original behavior. And we regard the search for such assumptions as a logical postulate wherever what is actually observed suggests through some regularity the conceivable possibility of such a reduction. Every regularity seems to demand an explanation in this sense.[289]

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[286] Bayes, "An Essay," 376.

[287] Efron, "Bayes' Theorem in the 21st Century."

[288] Guido Fioretti, "Von Kries and the Other 'German Logicians': Non-Numerical Probabilities before Keynes," *Economics and Philosophy* 17, no. 2 (2001): 245-73.

[289] Kries, *Principien*, 123.

Thus, as this shows, it is the "far greater range of real behavior" that is needed to determine whether the observation of cold baths and less pneumonia deaths is merely accidental. Only knowing that, which counts as a prior belief in Bayes' terms, could we combine it with current evidence to yield anything of validity. Yet, this does not mean that we would build a model and then test it using current data. For Kries, the prior knowledge is knowledge of probability, only in a non-numerical form. Thus, it would make even the variables in a model probabilistic: rather than "fixed entities with variable attributes," it is more accurate to refer to variable attributes that, within a given range of possibility, can *assume* the form of fixed entities.[290]

Like Bayes, Kries draws chance and probability together, and this as we will see, proves consequential for the probabilism he ultimately recommends. But for Bayes to make probability contingent on prior belief or expectation requires an additional component, and something far more unconventional in comparison to frequentism and less "empiricist" than what Bayes' argument implies. Thus, Kries separates probability statements (which he sees as subjective and fallible) from the knowledge (e.g., scientific or theoretical) that would give them validity, essentially arguing that a probability claim cannot be made valid by either quantification or by an *ex post facto* theoretical statement about a quantified result (e.g., mechanism). The problem with frequentism is that it associates objectivity with measurement, forcing it to divide outcomes to resolve the aforementioned equiprobability problem. The difference, Kries proposes, comes in knowing how and where probability inheres not in previous experiences or as countable (or datafiable) occurrences but as a "range of possibility." And, thus, he arrives at the concept of *Spielraum*.

Kries describes the *Spielraum* as a "totality of all states of [a] system that would appear possible to us under [certain] circumstances." Possibility here is "determined by the dissimilarities of behavior in all relationships" as they "combine with each other quite arbitrarily." If all "combinations appear to be equal" then what we consider to be the "scope of play" simply conveys that all the points are "arbitrarily combinable." This may not be a *Spielraum* at all, but simply an encounter with "absolute chance" [*asboluter Zufall*]. When *Spielraum* has a "configuration," however, then it can be "broken down into parts that the whole can represent as equal." What follows is "our expectation about how the system will actually behave in this way."[291]

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[290] Andrew Abbott, "Transcending General Linear Reality," *Sociological Theory* 6, no. 2 (1988): 169-86.

We cannot call this a purely "subjective" contribution, however, because as Kries argues against Bayes, if there is not a *Spielraum* to expect, then we cannot hold expectations of it. Rather, and as we will expand upon later, Kries denies the "subjective" and "objective" distinction Bayes maintains (giving preference to the former) by implying that our subjective expectations, to be present at all, must essentially *loop into objective* "scopes of play." *Spielraum* are probabilistic. We can expect a "peculiar or unique" *Spielraum* from the contrast between part and whole, or expectation rules that apply *here* but not *there*. As Kries puts it, "expectation formation [*Erwantungsbildung*] … essentially depends on the comparison of margins … The *Spielraum* to be assessed is of a certain, specifiable size …".[292] Once again, the argument here muddles a clean distinction between "objective" and "subjective" probability, as championed by the frequentist paradigm and maintained more or less intact by Bayesianism. When our probabilistic knowledge changes with new evidence, what changes is not our "reason to believe," that is, confidence in our prior belief. What changes is how we *loop in*, or how well our expectations or models' capacity to *make actual*, in their own representative way, what is already *possible* (without them). For Kries, this draws our attention to a concept that is unavailable to both frequentists and Bayesians (though is, arguably, resonant with the classical probability theorists), but one which, as Kries argues, largely connotes what it means for a scientific argument rooted in an estimation of probability to be *valid*.

The Birth of *Chance*

The terminological obscurity that can follow from interchangeable terms like chance [*Zufall*], probability [*wahrscheinlichkeit*], possibilities [*Möglichkeiten*], even coincidences [*Zufall*] or opportunities [*Gelegenheiten*] is a potential frustration of any probabilistic theory. All of these are part of a probabilistic lexicon, whether frequentist, Bayesian, classical, *or* Kriesian.[293] Yet, it is only by specifying what *Chance* is that Kries makes his full departure, particularly from the frequentists.

Take the example of rolling two six-sided dice. Here, rolling a 12 refers to an "objectively existing *Chance*" [*objectiv bestehende Chance*] *not* to what is recorded when we try to calculate the probability of rolling a 12. Here, "*Chance* always means cutting off as superfluous all special considerations as to whether the outcome in question will occur in an individual." For example, with a normal 6-sided die, rolling a 12 (double six) means that all other possibilities did *not* occur. For Kries, all probabilistic statements contain a similar presupposition: the events occur against a background of other possibilities that do not, but which we could have *expected* [*Erwatung*] to occur. As he puts this all together, Kries finds *Chance/Chancen* here: "*Chancen* always represent the range of ontological action spaces [*Grossen-Relationen ontologischer Verhaltungs-Spielraume*] which, as we will see, is closely related to the concept of chance [*Zufall*]."[294]

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[291] Kries, *Principien*, 41-42.

[292] Ibid, 62.

[293] Ibid, 95.

For Kries, if in a game of dice, we roll 6, 5, 4, 3, 2 consecutively then we would suspect that the game we are playing is "not a game of chance [*Zufalls-Spiel*] in the way previously assumed." It might instead be a game of *Chance*: an action-space that is not random, and about which we can therefore form expectations. What we can pull from this example is a simple but important lesson. While we can do "probability calculations" on games of *Chance*, those numerical calculations do not mean that we understand *Chance*. Rather, such a knowledgeable grasp "consists entirely in the systematic formation of expectations based on the principle of scope [*systematischen Erwartungsbildung auf Grund des Princips der Spierlraume*]." In this sense, "probability theory is strictly understood as nothing but a systematic calculation of play [*Spiel*]" or the non-numerical calculation of action within a given range of possibility that is *ipso facto* predicated on expectation.[295]

According to Kries, such a conceptual framework puts the "controversy about the subjective and objective meaning of probability claims to an end." Frequentism can only make clear "parts of [an] objective content." Without "the subjective element of probability being mentioned at all ... this could not succeed as long as one had not learned to make clear to oneself the objective relationships determining probability."[296] More specifically, Kries offers a way to salvage what the frequentists disparaged as "subjective probability" but without making this contingent on reasonable expectation. For Kries, the formula changes. To know probability, we must have some knowledge of objective *possibility*, and far from this being an argument about subjective probability, for Kries, this is necessary for any numerical measure of probability.[297] By themselves, frequencies are ultimately superficial since, lacking information on the objective mechanism that produces them, we cannot rely on them to tell the difference between those that reproduce the underlying regularities versus those reflecting (unlikely but possible) fluke occurrences, especially when the tests studied are independent of one another, with the observations taken at different times.[298] For Kries, frequencies are too flimsy a basis from which to build an understanding of probability. While they are the ("actual") output of an objective mechanism, they do not define the nature of probability. This is because Kries did not think probabilities should be equated with or made dependent on the methodological operations of the scientist (like the calculation of ratios). Instead, probabilities were a *real feature* of complex initial conditions generative of the sort of outcomes bean-counted by frequentists after the fact.

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[294] Ibid, 95-96. In this respect, "[l]aws realize certain events under certain 'ontological' conditions. Insofar, any realized event is only one possibility among infinite [sic] many other events which conform to the same law or complex of laws." Helmut Pulte, "Johannes von Kries's Objective Probability as a Semi-classical Concept: Prehistory, Preconditions and Problems of a Progressive Idea," *Journal for General Philosophy of Science* 47, no. 1 (2016):109-129, quotation is on p. 120.

[295] All quotations from Kries, *Principien*, 99. "Ontological action spaces" or *Spielraum* would be independently translated by John Maynard Keynes in his *Treatise on Probability* as "field," likely in reference to the colloquial, at the time, phrase "playing field" (e.g., "the playing fields of Eton"). "Kries presents the most interesting and careful example of a type of proof which has been put forward by a number of writers. We have initially, according to this view, a certain number of hypothetical possibilities, all equally probable, some favorable and some unfavorable to our conclusion. Experience, or rather knowledge that the event has happened, rules out a number of these alternatives, and we are left with a field of possibilities narrower than that with which we started. Only part of the original field or *Spielraum* of possibility is now admissible. Causes have *a posteriori* probabilities which are proportional to the extent of their occurrence in the now restricted field of possibility" (Keynes, *Treatise on Probability*, p. 176).

In other words, probability claims are only *contingently*, not necessarily, numerical. Bayes would agree with this, but Kries takes the idea further. Probability inheres in *Spielraum*, and there are limits from what we can learn by attaching numerical quantities to what we count as their "actual outcomes." Even while Kries makes the strict distinction between subjective and objective probability, in the frequentist sense, essentially meaningless, there is still room for similar concepts; but rather than a strict distinction between the two, which invites disparaging the insufficiency of subjectivity relative to objectivity, he proposes a *relation* between the two. Expectation rules, probability learning via analogy,[299] and *Spielraum* are probabilistic concepts that refer to this relation, as is what Kries describes *Taxirung/Taxiren* or "evaluation."

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[296] Kries, *Principen*, 76.

[297] Ibid, 181.

[298] See Michael Heidelberger, "Origins of the logical theory of probability: Von Kries, Wittgenstein, Waismann," *International Studies in the Philosophy of Science* 15, no. 2 (2001): 177-188.

[299] Overall, Kries,' "most original conclusion" is his using analogy to solve the "riddle of induction." And it is precisely because judgments of probability are built from analogy between cases, which always fall short of perfect correspondence—as when a doctor establishes the probability of a disease based on the similarity between the present set of symptoms and those encountered before—that probabilities are not necessarily numerical and be build from

> When we evaluate [*Taxiren*] numerically the probability of an analogy at 5/6 and then consider a case of an expectation where the dimensions of the possibility spaces of alternative outcomes are in the ratio 1:5, these are completely heterogeneous contexts, incomparable by their very nature. Consequently, their point of comparison is merely a psychological one. What is compared is the psychological certitude in the two contexts: this is all they have in common.[300]

Kries speaks in this context of a "thought that keeps us wrapped to a guess" even though this makes our expectations uncertain. This is evident in a "doctor's hope" about a patient's fatal condition, and more generally in "idioms of danger, hope, etc.," all of which indicate the effect of "valuation" in maintaining the presence of uncertainty. In this case, "subjectivity *arises*" from the mismatch and disanalogy with the *Spielraum* in question: "The subjectivity in establishing what we must consider as equally possible was the essential reason for limiting the numerical form of probability to particular cases." The same is true in situations like rolling dice where how we roll cannot dictate the outcome: in this case, subjective probability is *prepared* to mismatch objective probability, and so we can hope for any (possible) result and are always left surprised by the (actual) result. Thus, "no grade of psychological certainty can be accurately attributed to any of these relations" between expectations and this *Spielraum*.[301]

Kries makes these distinctions by using the same keywords typically found in probabilistic statements.

> Similar to the word chance, probability and possibility also acquire special connotations in these areas. After what has been said above about the subjective nature of probability, it is evident that in general one cannot simply speak of the probability of an event as of a specific value. Rather, it is always a determination about it [that] requires whose expectations are specified, or what intellectual state probability should correspond to. An event may be very likely to me, improbable to someone else who knows more about its conditions. In the realm of chance [Zufall], however, there can be probabilities which we may designate as generally valid because it is impossible for us to go beyond that insight and knowledge. Such generally valid probability means, if stated

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experience; Fioretti "John Maynard Keynes and Johannes von Kries," 54.

[300] Kries, *Principien*, 181-82.

[301] Ibid, 183.

> without further explanation, that when the dice are rolled, each of the six possible outcomes is equally true. It is apparently remarkable that under these circumstances the probability of the event exists or has existed without further explanation ….[302]

Thus, "generally valid probability" (*allgemein gültige Wahrscheinlichkeit*) refers to a fully objective probability, about which we (nor anyone else) can know: we cannot loop into it. This would be an impossible statement for a Bayesian to make, though a Kriesian can make it and agree that probability arises from the marriage of a prior belief and new evidence. We have argued, with Kries, that if "new evidence" is not simply a "generally validity probability," it must come from a *Spielraum,* which means we improve our knowledge not through more data necessarily, but through an understanding of initial conditions: what makes the events we measure (as actual) *possible*.

Probabilistic values that have *no* relationship to our "expectations [*Erwartungen*] … can be a matter of coincidence or absolute chance" not because that is what they actually are, but because this expresses a relation. As Kries envisions it, "we often hear of an event that actually happened but could not have happened. Often the comment is made that something that happened could have easily taken a different course."[303] These are common statements to make, and while they seem "paradoxical at first glance," they are not meaningless: "Here, as always, the assertion of the possibility of various courses of action presupposes generally designated, generalized conditions" that selectively form our expectations. To have expectations, as Kries argues, is to have a "*measure of recognisability* [*Massgabe der Erkennbarkeit*] … [We] form a generally defined condition from the precisely determined circumstances of an individual case."[304] Such a focus may account for his diffuse influence and appeal to theorists dealing with issues in the methodology of the social sciences, such as Max Weber. However, Kries was not a philosopher by training, and therefore approached these thorny conceptual issues from the perspective of an applied, working scientist.[305]

Kries, Weber, and Sociological Method

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[302] Ibid, 188.

[303] Ibid, 188.

[304] Ibid, 188-89.

[305] Pulte, "Johannes von Kries' Objective Probability," 111ff.

While Kries is typically recognized as an influence on Weber, few scholars have treated Kries' approach, and how it differs from standard (statistical) probability theory, on its own. We have tried to rectify that, reading the same things that Weber read as he adapted Kries probabilism to propose a probabilistic method. Here we will keep our examination of their relationship limited to Weber's early (pre-1913) adoption of Kries' arguments, as a prelude to what Weber adapts (specifically the concept of *Chance*) in his 1913 *Logos* essay and eventually in *Economy & Society*. At this early stage (1906), as Weber shifts into his own approach to sociology, what is most relevant from Kries is his idea of *objective possibility* [*objective Moglichkeit*] and how this informs the idea of "adequate causation."[306] Kries's *Principien* opened probabilistic reasoning up beyond the limits of frequentism, in some ways returning probabilistic reasoning to the places the classics had taken it. The emphasis here, which Kries applies to a variety of fields including the law, is on a particular *Spielraum* and the patterns and tendencies that, under its auspices, become objectively possible. How could such knowledge be applied even if a "probability calculus" is not possible?

As Kries argues, "one underestimates the importance of numerical ratios if one only considers probability values … [We] call two outcomes probable if we no longer have a reason for expecting the other has a far more important objective meaning."[307] In cases where we do *not* have a reason for expecting an outcome to have an "objective meaning," then probability values become significant ("generally valid") by themselves. But this only conveys that the "configurations of conditional circumstances" (*Spielraum*) first make these outcomes "objectively possible." This is the idea that is now centered.

One venue in which Kries's ideas were debated was legal science and jurisprudence, as focused particularly on the distinction between "adequate and accidental causation," the "objective possibility of a damaging event," and the difference between "absolute danger and dangerousness."[308] Kries's probabilism made inroads into legal conceptions of liability and responsibility. The "von Buri-von Bar" theory, for example, argued that legal responsibility could be attached to actions that not only had been established (beyond reasonable doubt) as a direct cause of a harmful result, but also served as "necessary conditions" for that result. Notably, Ludwig von Bar served as one of Weber's law professors.[309]

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[306] Kries dealt with this idea the most in a followup to his *Principen*, the three-part article "Ueber den Begriff der objectiven Möglichkeit und einige Anwendungen desselben" published in 1888 in the *Viertljahrsschrift für wissenschaftliche Philosophie.* This is the article that Weber refers to in the second of his "Critical studies in logic of cultural sciences" entitled "Objective possibility and adequate causation in the historical approach."

[307] Kries, "Ueber den Begriff," 190.

[308] Ibid, quotations are on p. 203, 288-89, and 294-95.

We can see why reasoning of this sort may have been appealing to Weber who, at the time, was trying to thread the needle in distinguishing sociological from legal and historical explanation. Weber first draws on Kries in Weber's engagement with the historian Eduard Meyer and the latter's argument that there cannot be a "historical method" if this means reducing the infinite variety of the singular that is the historical past.[310] To make his case, Meyer double-downs on "free will" and chance (*Zufall*) events as the core of a legitimate historian's explanatory frame.[311] Weber, in his critical response, takes a position focused squarely on probabilistic reasoning instead. Under Meyer's tutelage, historians could only make judgements suitable to a game of chance, as only these sorts of judgements preserve the strict independence (e.g., one event makes no difference for the probability of any other, later event) of whatever they happen to judge.[312] They are appropriate to probabilistic conditions in which our judgment is so detached from objective processes that we can *merely* (and feeling the full weight of our isolated subjectivity) guess, and one guess is no better than any other. For Weber, Meyer is wrong on the grounds of probabilistic reasoning: his recommended approach cannot be the *modus operandi* of the historian, as historians do make "judgements of possibility" that, on some grounds, are non-arbitrary. They select and single out certain events and actions as *adequate* causes.[313]

These questions are Weber's entry point into a more specific discussion of what he is

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[309] Kries cites Bar's text *Fundamentals of Criminal Law* in his 1888 articles; see Stephen Turner and Regis Factor, *Max Weber: The Lawyer as Social Thinker* (New York: Routledge, 1994), 124.

[310] Max Weber, "Critical Studies in the Logic of the Cultural Sciences: 1. Critique of Eduard Meyer, 2. Objective Possibility and Adequate Causation in the Historical Causal Approach," in *Max Weber: Collected Methodological Writings*, edited by Hans Henrik Bruun and Sam Whimster, translated by Hans Henrik Bruun (New York: Routledge, 2014), 139-184.

[311] Ibid, 141-42.

[312] As Weber adds in a footnote, "The so-called games of 'chance" … (dice or lotteries) are based on this 'chance.' The fact that the connection between the concrete outcome and certain parts of the conditions determining it is *absolutely* unknowable is constitutive for the possibility of a calculus of probability, in the strict sense of the term." Ibid, 141.

[313] Heidelberger argues that Kries "very likely" adopted the idea of adequate causation from the philosopher Baruch Spinoza, particularly his *Ethics*: "I call a cause 'adequate' if its effect can be clearly and distinctly perceived through it. I call it 'partial' or 'inadequate' if its effect cannot be understood through it alone." See Michael Heidelberger, "From Mill via von Kries to Max Weber: Causality, Explanation and Understanding," *Max Weber Studies* 15, no. 1 (2009): 241-65, quotation is on p. 249.

"plundering" from Kries, but they reveal certain paradoxes if we maintain a strongly interpretivist stance toward what Weber is arguing. The elements are well-known: to single out a given "fact" as adequately causal, we must build a "complex of relevant contributory factors," and then consider if a given factor were to be taken out, would the same "course of events" have happened in the same way. The paradoxical aspect is that Weber acknowledges the "complex of relevant factors" as built by an act of "imagination," and yet, we make a "judgment of objective possibility" based upon "rules of experience," a phrase that Weber uses persistently as he makes this argument.[314] Thus, imagination seems "wide open to subjective arbitrariness," while rules of experience, Weber implies, are not *entirely* subjective: our judgment of objective possibility can make sense to others. For Weber, this means that while arbitrariness can take over, should we try to imagine what *would have happened* had a given factor not been present in a given causal complex (e.g., what would have happened had the D-Day invasion failed in 1944?), it is not a concern when our analytic gaze is focused on *what did happen*, with our questions focused on causal factors that explain why (e.g., did the D-Day invasion cause the collapse of the Nazi Germany?). The difference is that the first question is not bound by rules of experience, thus allowing the imaginative capability to take over, while the second question is, which tests that imaginative capability by something non-subjective.[315] More specifically, the difference here indicates how Weber grounds his arguments in principles of probability calculus even though these sorts of questions cannot be resolved quantitatively.

As Weber formulates these arguments, he held no identification as a sociologist at this point, yet he was seeding ideas (via Kries) that will later turn up as the core of his sociology (which we explore further below). This suggests two things: first, that if a sociological (here "historical") method is not to be "arbitrary" then it must be *probabilistic*, rooted in arguments about adequate causation, as grounded in judgments of objective possibility. Second, this is not a statistical recommendation, if by that we mean that those judgments can only be valid if they are made based on frequency counts. Judgments of objective possibility, which can distinguish adequate causes from chance causes, are valid only by way of "rules of experience" [*Erfahrungsregeln*], which Weber emphasizes in a coded reference to what Kries calls "rules of expectation" and "measures of recognizability." Because each of these phrases refers to a looping in, of subjective toward objective probability, they stand as a refutation of any claim that, in this case, the judgments the historian makes are like judgments of games of chance where anything goes because nothing we could conceive of will ever anticipate an outcome. If what we are dealing with is not an underlying chaos but more like a *Spielraum* (e.g., probabilistic order), in which some things are capable of action and can be adequate causes, in which only certain possibilities can be made actual (through action), then we can break the objective processes that a historian documents from initial conditions, and assign likelihoods to outcomes, making judgments of objective possibility, distinguishing these factors as adequate and those as chance causes, based on what we know about a *Spielraum*.[316]

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[314] Ibid, 179-80.

[315] The distinction here bears a certain resemblance to Bourdieu's argument against Hegelian "absolute possibility" mentioned above in chapter 2 and Bourdieu's claim that, in contrast to idealism, it is difficult *not* to be oriented by probability, even in presumably entirely subjective domains like imagination or fantasy. See Pierre Bourdieu, "Three Forms of Theoretical Knowledge," *Social Science Information* 12, no. 1 (1973): 53-80, especially p. 64-65.

Weber first adapted Kries' ideas in the context of his "methodological writings," seeing them as a way to distinguish "cultural science" as a field on the grounds of probabilistic reasoning. Yet, the probabilistic reasoning found in these arguments has gone mostly unacknowledged. Adequate causation and ideal types, for instance, are generally treated as purely epistemic or interpretive tools, which for many connote exactly the arbitrariness that Weber was at pains to distinguish. This only fuels the false presumption that more data (e.g., a larger-*N*, more cases) is needed to perform anything like a probabilistic judgment. We argue instead that such a judgment is *not* an "interpretation" at least not according to any current analytic understanding of that word and the method it typically entails.[317]

Drawing stronger links to Kries suggests an alternative: if our analytic judgments are to be equivalent to guessing at the result of a game of chance, then these concepts lead to an epistemology of looping, between subjective and objective probability, with the premise that it is possible for the two to be more in alignment. A cause is adequate not according to an interpretation, or amendable by theories that we alone have access to, but relative to a *Spielraum*, constructed as ranges of possibility, that make *Chance* (opportunities, probabilities, risks) apparent *in action*, within the parameters of which certain things are adequate causes, while outside the range they are not. A *Spielraum* is real, unknowable in its entirety, but capable of grounding judgments. *Chance* is, in this application, only part of a critique of knowledge. Nevertheless, sociology, as Weber will eventually conclude over the couple of decades from the time he first engages with Kries, is in the business of taking it much further—using probabilistic reasoning to study probabilistic orders.

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[316] As Weber puts it, in clear distinction from a strict epistemic understanding of "possibility": "[A] judgment of 'possibility'—in the sense in which that term is utilized here—always implies a reference to rules of experience. The category of 'possibility,' therefore, is not utilized in its *negative* form—that is to say, as an expression of the fact that we do not, or do not completely, know something … Quite the contrary, [the judgment of 'possibility'] here implies a reference to positive *knowledge* of 'rules governing events,' to our 'nomological knowledge,' as it is usually termed." "Critical Studies in the Logic of the Cultural Sciences," 175.

[317] See Reed, *Interpretation and Social Knowledge*.

Promising Birth, Premature End? Probabilism Versus The Comtean Divide

If a more interpretivist, epistemic reading of Weber, particularly these "methodological" works, has long prevailed, a major reason why is that the probabilistic references Weber makes have otherwise been encoded as interpretive, as we show below using the example of Alfred Schutz's reception of *Economy and Society*. This does not seem problematic because all reference to "probability" and "possibility" here appears as "metaphorical" or even informal compared to statistics, and so Weber could not be making claims that involve probability in any fundamental way. We have argued, instead, that Weber's arguments are probabilistic through and through, they just involve a version of probabilism orthogonal to statistical measures.

What Weber argues against, and what he strives to reveal through persistent incomprehension, is a dividing line between probability and interpretation that we have referred to as *the Comtean Divide,* one carefully maintained, though with an untenable schizophrenic status, throughout the history of modern empirical social science. To fall on one side of the Comtean Divide means to divide probability from interpretation, thus allowing for predictions to be made without any concern with action and making action theory obtain a vocabulary removed of probabilistic reasoning. Probability becomes a power of the variable rather than the actor. As we show below, this contributes to a kind of nominalistic reasoning and authoritative knowledge, as it always has. To fall on the other side of the Comtean Divide means refusing to make similar divisions, to not break probability and interpretation apart and make them separate concerns, but to start from a position of continuity, which necessarily means engaging possibility *as* possibility, and embrace probabilistic reasoning instead. From this perspective, probability, and action are inseparable: to be concerned with one is to be concerned with the other.

To tell the history of probability with Kries is to demonstrate his departure from a tradition that, for the most part, remains *the* history of probability. Yet, as we have tried to show, it is only since the professionalization of statistical expertise in the late 19th century that we find probability so nearly inextricable from frequency counts, large-*N*s, and "statistical facts" like averages, distributions, and populations. With Pascal and Huygens, probability began as calculations performed on games of chance, requiring only knowledge of the rules of play and the assumption of an interest in winning. And while the late 19th century appearance of Kries echoes that tradition, particularly in taking non-subjective expectation as an analytic focus, it also breaks with classical probability by not limiting the appearance of probabilistic order (or *Spielraum*) to rule-bound action found in the design of games of chance.

We are not the only ones to notice this, and presumably a recognition of probabilistic reasoning secretly hidden in the thought of those (like Weber) subject to authoritative readings as non-probabilistic could, should it be recovered, revive certain theoretical traditions (and perhaps allow social theory not to pale by comparison to data science probabilism). Briefly, consider one trajectory for which more evidence is certainly needed, but should it hold water, this re-reading would fundamentally alter basic concepts like "discourse" and "practice" at least as they have been inherited from certain thinkers.

Arguably under the influence of Kries' idea of *Spielraum*, Husserl made proposals about "seventeenth century mathematicians" who enabled "the theory of exact (quantitative) probabilities" because they were the first to propose that it is "all a matter of establishing a field of equal possibilities in objectively valid ways … and then of referring every completed cycle of weight probability back to this *basic field*."[318] Husserl's argument links this quasi-Kriesian idiom back to people like Pascal and Huygens (typically included wherever "seventeenth century mathematicians" are mentioned). Notably, Martin Heidegger draws the term *Spielraum* from Husserl (his estranged mentor) but gives it a meaning strongly akin to what we find in Kries (though both are uncredited).[319] This has a potential bearing on the thought of all those influenced by Heidegger's thought, particularly its practice orientation and "ontic/ontological" points of emphasis, which Heidegger frequently mentions in the context of *Spielraum*.[320] Thus, the connection that Husserl draws here could hold untapped significance for the trajectory of social theory by shifting the connotations (particularly, the "entitization" of practices and discourse as things rather than activities) of core ideas inherited from this tradition of continental philosophy.

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[318] Edmund Husserl, Logic and General Theory of Science, translated by Claire Ortiz Hill (Dordrecht: Springer, 2019/1910-1918), 267. For an account of a direct connection between Kries and Husserl, see Carlos Lobo, "Husserl's Logic of Probability: An Attempt to Introduce in Philosophy the Concept of 'Intensive' Possibility," *Meta:Research in Hermeneutics, Phenomenology, and Practical Philosophy* 11, no. 2 (2019): 501-546.

[319] Heidegger makes ample use of *Spielraum* for the purposes of making ontological claims in his influential *Being and Time* as well as his later essay "On the Essence of Ground." For example, in *Being and Time,* we can find original phrases like: "Der Entwurf ist die existenziale Seinsverfassung des Spielraums des faktischen Seinkönnen." This is translated as: "Project is the existential constitution of being in the realm of the factical potentiality of being." That last phrase strongly resembles Kries' earlier use of *Spielraum*, though Heidegger never appears to draw this connection. Nor does he in this passage from the "Ground" essay: "Every accounting for things must move within a sphere of what is possible [*Spielraum*]

For his part, Weber sensed early on that Kries' probabilism could make a significant difference for the grounding of causal claims in social and historical knowledge. By separating probability from frequency counts, by conceptualizing expectation and judgment as loops, Kries brought into question the firm distinction between subjective and objective probability that had become *de facto* true of probabilism after frequentism and remains, more or less, a token of unquestioned faith today (we need only consult Kahneman and Tversky again). This has bearing on fundamental questions in sociology, as we will expand upon in the third part of this book. Suffice it for now to say that despite its incorporation of statistical methods and conceptual commitments to one or another form of constructionism, sociology not infrequently conveys a static and stationary world, in which structures rule, cultures are singular and definite, and action serves as the carrier of order, rather than the other way around. Weber, for his part, envisioned sociology, still a nascent field when Weber finally identified with it, to be the discipline that would assume a probabilistic mantle and specialize in the study of *Chance*. Sociology in a probabilistic mold is also what Pierre Bourdieu eventually found his way around to, after an extended tour through philosophy, Algeria, and structuralism, in large part (as

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… In accordance with its essence, such grounding always necessarily provides a given range of what is possible [*Spielraum*]." Elsewhere *Spielram* is translated as "leeway" in Heidegger's text. See Martin Heidegger, "On The Essence of Ground," in *Pathmarks*, edited by William McNeill (Cambridge: Cambridge University Press 1998/1930), 133. Martin Heidegger, *Sein und Zeit* (Tübingen: Max Niemeyer Verlag, 2006/1927), 145; Martin Heidegger, *Being and Time*, translated by Joan Stambaugh (Albany, NY: SUNY Press, 1996/1927), 136.

[320] Robert Nichols makes this point with a thorough re-reading of Foucault's *oeuvre* from the standpoint of the major influence on Foucault of Heidegger, which Foucault himself admitted both early and late in his career. The following argument, in particular, suggests the difference that the seeds of probabilistic reasoning could have made in Foucault's novel approach: "Foucault speaks in this idiom most explicitly … where he defined an "ensemble pratique" as a "homogeneous domain of reference," defined not by "the representations that men give of themselves" (a history of ideas or self-consciousness), nor "the conditions that determine them without their knowledge" (a structuralist historical materialism, for instance), but "the forms of rationality that organize their ways of doing things … and the freedom with which they act *within these practical systems*." Nichols argues that Foucault's "ensemble pratique" is essentially incomprehensible without some knowledge of *Spielraum*. Robert Nichols, *The World of Freedom: Heidegger, Foucault, and the Politics of Historical Ontology* (Stanford: Stanford University Press, 2014), quotation is on p. 253, see also p. 62ff.

we show below) because of his encounter with Weber's probabilism, which for Bourdieu was not clouded by a prior reception or the field-level stakes of giving and maintaining authoritative readings of "classics."

Despite Weber's and Bourdieu's standing in the sociological tradition, non-quantified applications of probability stand out as anomalies and non-sequiturs. The reception of Weber's probabilistic ideas by later scholars like Parsons and Schutz, who served as key intermediaries for Weber's work in American sociology, goes some way to account for this, as their reception would shroud Weber's probabilism behind a thick cloud of confused reading and willfully misguided translation, helping to implant the mistaken idea found among nearly all sociologists today that Weber's sociology is a sociology of "subjective meaning," and that to pursue a sociology like this, we must bracket probability from interpretation. This proved instrumental for Schutz and Parsons' influential projects in sociology, particularly Parsons' theory of action, in part because they both took the frequentist approach to probability, and its strict separation of subjective and objective, for granted, thus handing probability entirely over to the statistics profession. Probabilism thus became synonymous in sociology with a quantitative methodology committed to frequentism. Accounting for the reception of Weber's probabilism by Parsons and Schutz can help explain, despite its promising birth, the premature end of—or, we would like to think, *pause on*—probabilistic reasoning in the social sciences.

Chapter 4 - Parsons' and Schutz's Erasure of Weber's Probabilism

> *The concept of "objective possibility" plays an important technical role in Weber's methodological studies. According to his usage, a thing is "objectively possible" if it "makes sense" to conceive it as an empirically existing entity. It is a question of conforming with the formal, logical condition. The question whether a phenomenon which is in this sense "objectively possible" will actually be found with any significant degree of probability or approximation, is a logically distinct question.*
>
> ~ Talcott Parsons, *The Theory of Social and Economic Organization*

From Kries to Weber, via Weber' admitted "plundering" of Kries's work, we move forward to a sociology rooted not in frequentism but in its late 19th century shadow, one that demands a logical investigation of numerical probability, eliminates the firm distinction between subjective and objective probability, and puts the onus on a new unit of analysis: specifically, *Chance*. This is a "what if?" story. What if Weber's seminal influence on the field, built during the incredible growth of American sociology after World War II, combined with Weber's totemic status as a "classic,"[321] and therefore able to exert contemporary influence through a revisiting and "bring backs," makes a probabilistic sociology, as both a strange neologism and a hardly distinctive label, latent all this time? With few exceptions (notably, Bourdieu) it has never become possible within the parameters of the field. The Weber we typically know we do not expect *this* of. We will now document some reasons why. In particular, we retrace the selective translation and skewed interpretation of the first part of *Economy and Society* (hereafter, *E&S*) by Parsons and Schutz (respectively) that laid the foundations for mainstream social theory by overlooking Weber's probabilism and leaving it overlooked until now.

The retranslation of *E&S* by Keith Tribe in 2021 can finally supplant the Anglophone reliance on the translation of the original four-chapter text done by Parsons and Alexander Henderson in 1947—adopted with slight modifications by Roth and Wittich in the most recent, and canonized, edition of *E&S*.[322] German-language scholars, who have had access to the original text since 1922, have appreciated and constructed a very different Weber, without the Parsonian mediation, compared to Anglophone scholars.[323] Parsons' introduction of Weber occurred when American social science was on the cusp of enormous institutional growth, with the postwar expansion, professionalization, and institutionalization of the American sociological juggernaut.[324] In this context, Parsons' Weber became *the* Weber, with all subsequent Webers remaining tied to Parsons' characterization even when they were overtly critical of it.[325] Until now, Parsons (though long dead) has still controlled *translation* as a means of concept-formation and a way of shaping Anglophone social theory's own *Spielraum*.[326]

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[321] See Jeffrey Alexander, "The Centrality of the Classics" in *Social Theory Today,* edited by Anthony Giddens and Jonathan Turner (Stanford: Stanford University Press, 1988), 11-58.

This historical dynamic has had considerable consequences for the development of theory and research in the social sciences in the United States and globally over the last half-century. Parsons' Weber is an unabashedly "cultural" Weber. Clifford Geertz would cement this version of Weber even further in the scholarly imagination as the central figure in triggering "the cultural turn" across the human and social sciences in the 1970s through the 1990s, subsequently suspending Max Weber in webs of significance that Geertz himself had spun.[327] However, the version of Weber that the cultural turn enshrined does not resemble the Weber that we can now find in Tribe's translation. For the most part, this Weber, entirely new and perhaps unrecognizable to Anglophone scholars, proposes a sociology featuring *Chance* as its core category, leaving it at odds with contemporary interpretivism or cultural sociology. Put simply, with access to a different translation, Weber's sociology can no longer be read as either "interpretivist" or culturalist.

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[322] Max Weber, *Economy and Society: A New Translation,* translated by Keith Tribe, (Cambridge: Harvard University Press, 2019). Max Weber, *Economy and Society* edited by Guenther Roth and Claus Wittich (Berkeley: University of California Press, 1978); Max Weber, *The Theory of Social and Economic Organization* translated by Talcott Parsons and Alexander Henderson (Glencoe, IL: The Free Press, 1948).

[323] Kari Palonen, "The State as a 'Chance' Concept: Max Weber's De-substantialisation and Neutralisation of the Concept," *Max Weber Studies* 11, no. 1 (2011): 99-117; Hubert Treiber, "Max Weber, Johannes von Kries, and the Kinetic Theory of Gases," *Max Weber Studies* 15, no. 1 (2015): 47-68; Gerhard Wagner, "Typicality and *Minutis Rectis* Laws: From Physics to Sociology," *Journal for General Philosophy of Science* 51 (2020): 447-458.

[324] Stephen Turner and Jonathan Turner, *The Impossible Science: An Institutional Analysis of American Sociology* (Beverly Hills: Sage, 1987).

[325] Jere Cohen, Lawrence Hazelrigg and Whitney Pope. "De-Parsonizing Weber: A Critique of Parsons' Interpretation of Weber's Sociology." *American Sociological Review* 40, no. 2 (1975): 229–241.

[326] Johan Heilbron, "Towards a Sociology of Translation: Book Translations as a Cultural World-System," *European Journal of Social Theory* 2, no. 4 (1999): 429-444.

[327] Clifford Geertz, *Interpretation of Cultures* (New York: Basic Books, 1973), 172ff.

As we document, when Parsons confronted the German text of *E&S*, he simply could not make sense of how Weber emphasizes "objective probability" and in particular how he relentlessly uses the word "*Chance*."[328] But we should not credit this to poor language skills on Parsons' part. Alfred Schutz, as a native German speaker and consummate Weber acolyte, also pivoted during his encounter with the exact same words. We can recreate these encounters because both Parsons and Schutz remarked upon them in detail. They took notice of *Chance* as they read Weber in the original. Schutz's criticism of Weber was fueled, it seems, by his confusion, which in turn fed directly into another conceptual framework that would also ascend to a position of authority alongside the global rise of American sociology: "social constructionism" inspired by social phenomenology.[329]

Part of this story includes the making of *Economy & Society* as a textual assemblage rather than a coherent monograph. Its 1978 (light blue) version features multiple translations and translators, texts written at different times and with different prerogatives (not all sociological), placed next to each other in a particular order but with no particular relationship. Not all the texts, arguably, would fit the definition of sociology that Weber offers in the first four chapters, which is not a surprise, as most of them were written before Weber authored those chapters, and we should not necessarily associate what Weber writes with even his own definition of "sociology."[330] This has led to a confusing—and anachronistic—amalgamation of Webers in the American sociological imagination today.[331] The inclusion of texts helped to further the Weber growth industry and was fueled in major part by the postwar institutional growth of American social science over the same period and the canonization of "classical theory" (circa 1947-1978).

To focus on the many fragments Weber left behind gives him the reputation as dilettantish, dabbling in historical case studies, giving authoritative interpretations of distant cultures and times, but with no unique "system" aside from a concern with action and meaning. This image lends itself to a particular kind of sociology—and a particular conception of social theory—today.[332] The American proliferation of Webers did not mark any significant chipping away at the Parsonian edifice. New Webers could and did appear by scouring the encyclopedic expanse of his output. Yet, Parsons still controlled the nucleus of Weber's work as a sociologist: the crucial first chapters of *E&S* that remained the only ones published with Weber's imprimatur prior to his untimely death. These chapters have, until now, remained accessible only through the original Parsons and Alexander Henderson translation that first introduced Weber's text to American scholars in 1947 as *Theory of Social and Economic Organization*. By showing textual confusions and misappropriations in the task of translation, ones that have proven of seminal consequence for several areas of contemporary social theory (cultural theory, interpretivism, phenomenology, social constructionism), the general significance of this reframing and retrieval will become clear by making a new, genuinely de-Parsonized Weber appear to Anglophone readers, as if for the first time.

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[328] We can see this if we consult the original (1921-22) *Wirtschaft und Gesellschaft* where "Chance" appears as always capitalized and often bolded or italicized (spaced letters in German text, reflected in Tribe's translation and reproduced here). Below we quote from this text to correspond with different translations.

[329] Peter Berger and Thomas Luckmann, *The Social Construction of Reality* (New York: Anchor Books, 1966).

[330] This particularly applies, we would argue, to Weber's most famous work, *The Protestant Ethic and the Spirit of Capitalism*, which we (retroactively) reread below as a probabilistic sociology.

[331] Randall Collins, *Weberian Sociological Theory* (Cambridge: Cambridge University Press, 1986); Stephen Kalberg, "Max Weber's Types of Rationality," *American Journal of Sociology* 85, no. 5 (1980): 1145-1179; Ann Swider, "The Concept of Rationality in the Work of Max Weber," *Sociological Inquiry* 43, no. 1 (1973): 35-42; Stephen Turner, "Weber on Action," *American Sociological Review* 48, no. 4 (1983): 506-519; John Bellamy Foster and Hannah Holleman, "Weber and the Environment: Classical Foundations for a Post-Exemptionalist Sociology," *American Journal of Sociology* 117, no. 6 (2012): 1625-1673.

The Making of *Economy and Society*

The text comprising the first part of *E&S* today constituted Weber's primary task for what remained the most productive and relatively least personally tumultuous of academic life. Between 1908 and Weber's death in 1920, he worked on what was meant to be a "handbook on the structure of modern capitalism" with the title *Grundriss der Sozialökonomik. Wirtschaft und Gesellschaft*, to be used as an "up-to-date reference work" (or perhaps textbook) for the growing number of doctoral students in business and commerce, then flooding into German universities. Alas, such best-laid plans would change many times. While Weber led the whole endeavor, involving many scholars and many contributions, the project never came to full fruition. Weber's single contribution remained what he had drafted as *Wirtschaft und Gesellschaft*: Three almost finished chapters, and a fourth fragmentary chapter.

With Weber's untimely death in June 1920, Marianne Weber's assistant Melichor Palyi took control of organizing the text from the written, rewritten, old and new manuscripts that Weber had left behind, with Marianne Weber deciding on the final ordering of the text.[333] As Tribe explains, "this dilemma—how to marry three and a bit new chapters, composed in 1919-1920 according to a new plan in Weber's head but nowhere written down, with a mass of preparatory material dating back many years—did not end with the solution of 1921-22" or the solution that Palyi and Marianne Weber reached at that time.[334] The 1921-1922 edition was ultimately published in four installments beginning in October 1921 and ending in September 1922. It is the first installment of this first edition that Tribe translated, as it was "the only section of the work that had been revised by Weber and typeset before he died in June 1920."[335] As such, it will also be the focus of the subsequent discussion. This edition would be followed shortly after that by the second edition in 1925 (featuring Weber's text on the sociology of music) and the third edition in 1947. After Marianne Weber died in 1954, editorial control passed to the jurist and founder of the *Max-Weber-Archiv* Johannes Winckelmann, who would publish a reordered and expanded fourth edition in 1956.

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[332] John Levi Martin, *Thinking Through Theory* (New York: Norton, 2015), chap. 1.

These details are not without consequence because coinciding with the travails of the *E&S* text is Weber's growing international prominence, especially in sociology. Arguably, nothing helped secure this reputation more than the translation of the first installment of the 1921-1922 *E&S* edition by Parsons and Henderson in 1947 as *The Theory of Social and Economic Organization* (*TSEO*). Their translation would be the basis for the first part of the 1968 two-volume English-language edition, published by the University of California Press with a visually striking light blue cover and edited by the sociologist Guenther Roth and political economist Claus Wittich. This version would now bear Weber's original title *Economy and Society.* This text mirrored the fifth German language edition that was published under Winckelmann's supervision. It compiled many unpublished manuscripts, and fragments Weber had left behind, not initially included in the 1921-1922 edition, most of which had been translated and published separately by that time (e.g., *The City*, *The Sociology of Religion*, *Max Weber on Law in Economic and Society*).

The knowledge-political context for this translation history was the growing "Americanization" of sociology.[336] These circumstances are essential for the following reason. Roth and Wittich's 1968 (reissued in 1978) two-volume English edition of *E&S* has effectively become *the* introduction (alongside the *Protestant Ethic*) to Weber *as a sociologist*. Such an introduction by this particular text leaves the reader with an impression of Weber as a historical dabbler or scattered dilettante rather than the version of Weber as a *systematic* sociologist he would identify with as he worked on the first and only partially finished part of *Wirtschaft und Gesellschaft*, and which was apparent, in embryonic form, in Weber's development as a probabilist, from his first use of Kries in 1906, to the systematic development of probabilistic principles (particularly the loop) in 1913, and finally to their fruition as interpretive sociology in the first edition of *E&S*.

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[333] Edith Hanke, "'Max Weber's Desk is Now my Altar': Marianne Weber and the Intellectual Heritage of Her Husband," *History of European Ideas* 35, no. 3 (2009): 349-359.

[334] Keith Tribe, "Introduction" in *Economy and Society: A New Translation* (Cambridge: Harvard University Press, 2019), 27.

[335] Ibid, 2.

In March 1920, just a few months before his death, Weber identified his ongoing work on the book as that of a "sociologist" in a letter written to the economist Robert Liefmann. In the letter, Weber includes the following noteworthy sentence: "In sociological terms, the state is no more than the chance that particular kinds of specific *action* occur."[337] On the one hand, such a statement could easily be shrugged off as a weak probabilistic commitment that could presumably be strengthened with more data or better measurement; it could also be read as immaterial to or *less important than* Weber's more well-known definition of the state (e.g., a territorial organization with a "monopoly on the use of force").[338]

Neither of these perspectives is on the right track. Weber's sociology gives ample room to the probabilism evident in his letter to Liefmann. Such implications and what they meant for a fledgling sociology were apparent to Weber as early as the 1913 *Logos* essay, which Weber himself associated with a "comprehensive sociological theory and presentation." The essay first presents many of the central ideas on *Chance,* objective probability, and expectation that he flirted with in 1906 and would systematically develop in the first two chapters of *Wirtschaft und Gesellschaft* despite the text remaining incomplete. They were also clear (in part and thematically) in articles Weber published in the *Archiv für Sozialwissenschaft und Sozialpolitik* during first decade of the 1900s and which were later collected posthumously as *Gesammelte Aufsätze zur Wissenschaftslehre* (1922). This means the bulk of material known to English readers as *E&S* (Weber, 1921-1922/1978), sketched *before* Weber worked on his fundamental conceptual and methodological framework, had not been reconceptualized or explained according to core concepts of what Weber understood as *his* sociology.

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[336] Stephen Turner. "The Origins of 'Mainstream Sociology" and Other Issues in the History of American sociology." *Social Epistemology* 8, no. 1 (1994): 41–67.

[337] Weber quoted in Tribe, "Introduction," 57.

[338] Weber, *Economy and Society*, 56.

Reading Weber with Parsons and Schutz

Accounting for the checkered history of the publication of *E&S* only takes us so far in explaining the curious erasure of Weber's probabilism in mainstream social theory. As critical are two influential interpretations that effectively blocked sociologists (particularly in the American field) from appreciating the none-too-subtle use of probabilistic terms in Weber's work. The German-born sociologist Ralf Dahrendorf, for instance, took note of this in 1979, the year after the University of California put together the most recent edition of *E&S* until Tribe's translation. Dahrendorf noted "the more than one hundred places" in *E&S* that Weber "uses chance as a word or a category, one cannot but be surprised about how little attention the literature on Weber has paid to the term."[339] A notable exception would be a paper published shortly thereafter by Stephen Turner in the *American Sociological Review* in 1983, which mainly concentrated on Weber's earlier methodological writings and not on *E&S*.[340] To date, no Anglophone scholar has followed Dahrendorf's gauntlet and attempted to make sense of Weber's use of *Chance*.[341]

Given the comprehensive range of Weberiana in American sociology over many decades, there will be other encounters with Weber's arguments from 1913 or in *E&S*. Even without Parsons' translation, the verbiage of strong probabilism can appear "practically impenetrable" and the claims easily dismissable.[342] It is not *possible* for probabilistic language to be used in these ways. Despite the apparent range that Weber gives to sociology, this counts as the subtle maintenance of an orthodoxy, with certain conceptual tropes remaining incontestable.

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[339] Ralf Dahrendorf, *Life-Chances: Approaches to Social and Political Theory* (Chicago: University of Chicago Press, 1979), 62.

[340] Turner, "Weber on Action"

[341] Dahrendorf himself tries to do this when he argues the following (in the chapter of his book *Life-Chances* entitled "Max Weber's Concept of 'Chance'"), noting how Weber seems to imply "the crystallized *probability* of finding satisfaction for interests, wants and needs, thus the probability of the occurrence of events which bring about such satisfaction…[it] is quite misleading to distinguish between objective and subjective dimensions [of probability]; what matters is the distinction between structure and behavior, opportunity and action, expectation and reality," Dahrendorf, *Life-Chances*, 73. Outside the Anglophone sphere (and the canonization of Weber under Parsons' influence), Pierre Bourdieu noticed Weber's probabilism (referencing the 1913 *Logos* essay) before Dahrendorf, taking note specifically of the "decoding of objective intention," based "as Weber shows [on] the chances that other agents will agree," Pierre Bourdieu, "Three Forms of Theoretical Knowledge," *Social Science Information* 12, no. 1 (1973): 53-80, quotation is on p. 70. A year later, Bourdieu refers to "the Weberian theory of 'objective probabilities', which has the merit of bringing to light one of the most fundamental assumptions, although tacit … namely the existence of a 'relation of intelligible causality' between generic chances ('typical') 'existing objectively on average' and 'subjective expectations,'" Pierre Bourdieu, "Causality of the Probable and the Future of Class" translated by Michael Grenfell in *Rethinking Economics* edited by Asimina Christoforou and Michael Lainé (London: Routledge, 2014), 247-284, quotation is on p. 235.

Much of this has to do with the translational mediation of two scholars, who effectively stood between Weber and American sociology. First, Parsons's heavy-handed translation of Weber's text—covering the first two finished chapters and fragments of the third and fourth—and adapting it to his "action frame of reference" as it was developed at the time. Second, Schutz's direct encounter with and dismissal of Weber's probabilism in his reading of the 1921-1922 first edition and his adaptation of a probability-less Weber to the project of phenomenological sociology. We will talk about their encounters with Weber's text in turn.

Talcott Parsons and *Chance* as a Numerical Statement

Parsons was more responsible than any sociologist for bringing Weber's work to the attention of an American audience with the prominence given (especially to The *Protestant Ethic*) to Weber in Parsons' *Structure of Social Action* and Parsons and Henderson's 1947 translation of the 1921-1922 German-language version of *E&S* as *TSEO*. Alas, this was not the first translation of Weber's work by an American academic. The economist Frank Knight (one of the Chicago School founders) had translated Weber's late-career lectures as *General Economic History* in 1927—a text that, incidentally, became the basis for one of the American Webers: Randall Collins's institutional and conflict-theoretic Weber.[343] It was only through a combination of fortuitousness and cunning that Parsons became involved in translating the first part of *E&S*. Otherwise, the translation would have likely gone to a team led by none other than Friedrich von Hayek, who had himself vetted Henderson, shortly after the latter received a double-first in economics from Cambridge in 1936, for the job. Parsons' involvement was, in one sense, secondary; he went over and amended translations that Henderson had already done. Still, in another sense, Parsons's involvement was pivotal because, without it, a very different

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[342] Alan Sica, *Weber, Irrationality and Social Order* (Berkeley: University of California Press, 1988), 188.

[343] Max Weber, *General Economic History* translated by Frank Knight (New York: Greenberg, 1927/1923); Collins, *Weberian Sociological Theory*.

Weber would have likely been received, and certainly not one that could be safely housed in sociology.[344]

The tradeoff of Parsons' saving Weber from the economists was to make Weber a predecessor of Parsons's normativist sociology focused on the "action frame of reference."[345] What is intriguing is how Parsons notices Weber's "relentless use of *Chance,*" but he quite evidently pivots away from it, based on what he believes will be a deep confusion in understanding the text. Thus, for example, on page 100 of the original 1947 book, while still in the first chapter of *Wirtschaft und Gesellschaft* after an 86-page introduction written by Parsons, we can find the following footnote:

> This is the first occurrence in Weber's text of the term *Chance,* which he uses very frequently. It is here translated by 'probability,' because he uses it as interchangeable with *Wahrscheinlichkeit*. As the term 'probability' is used in a technical mathematical and statistical sense, however, it implies the possibility of numerical statement. In most of the cases where Weber uses *Chance,* this is out of the question. It is, however, possible to speak in terms of higher and lower degrees of probability. To avoid confusion with the technical mathematical concept, the term 'likelihood' will often be used in the translation. It is by means of this concept that Weber, in a highly ingenious way, has bridged the gap between the interpretation of meaning and the inevitably more complex facts of overt action.[346]

What is fascinating about this footnote is just how much of Weber's original text will need to be modified, in most cases substantively, if one follows this rubric, not to mention that Weber would have known that Kries distinguishes between these terms and does not use them interchangeably. Nevertheless, Parsons and Henderson change the text to fit this mold.

Consider the difference it makes. The sentence to which Parsons and Henderson append this footnote is in their version translated as: "On the other hand, even the most perfect adequacy on the level of meaning has causal significance from a sociological point of view only in so far [*sic*] as there is some kind of proof for the existence of a probability [21] that action in fact normally takes the course which has been held to be meaningful."[347] In Tribe's translation, which does not follow their rubric of interchanging probability [*Wahrscheinlichkeit*] and *Chance*, the sentence is rendered differently as:

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[344] Tribe, "Introduction," 29ff.

[345] Charles Camic, "Reputation and Predecessor Selection: Parsons and the Institutionalists," *American Sociological Review* 57, no. 4 (1992): 421-445.

[346] Parsons and Henderson in Weber, *Theory of Social and Economic Organization*, 100 n 21.

[347] Weber, ibid, 100.

"On the other hand, even the most evident meaningful adequacy has significance for sociological knowledge only to the extent that a correct causal statement can be given—as proof the existence of a (specifiable) *Chance* that action does tend to follow an apparently meaningful course with specifiable frequency, or something close to it (either on average, or in a "pure" case)" (italics in the original).[348]

Parsons and Henderson assume, in this case, that probability must be "mathematical" or epistemic, a type of measured objective probability, or it cannot be relevant for sociological knowledge. "Likelihood," therefore, assumes a lower grade "subjective" probability that can keep the sentence whole despite this apparent conflation between "meaningful adequacy" and "mathematical probability." Such a view is limited because it assumes that any relationship between meaning and *Chance* as a probabilistic term must be a conflation. But we would argue that Weber is not conflating concepts here because he is working with a different understanding of *Chance* and probability than Parsons and Henderson assume must be the only available form.

Significantly, this bracketing of "meaningful adequacy" from probability serves the Parsonian effort well. In an important sense, this opens the explanation of social action up to the imputation of "culture concepts," in various molds, to account for meaningful adequacy in *lieu* of probability. It allows Parsons, and those after him, to posit all sorts of things in the blank space now left open to meaning severed from any relationship to probability, including internalized values, beliefs, "webs of significance," interpretations, etc.—all of which have had considerable consequences for the course of 20th century social theory.

By the time we get to Parsons and Henderson in the 1940s, then, we see them working with an understanding of the idea of probability that seems completely narrowed to a "technical mathematical and statistical" method. This does violence to the very substantive meaning of Weber's approach to action explanation, as rooted in *Chance* (see Chapter 5), something which they show no knowledge of. There is a stream of commentary on how Parsons's action theory is or is not like (or identical to) Weber's action theory.[349] We contend that it is on this very (neglected) issue—specifically, whether probability can be consulted by the analyst to render actions interpretable and meaningful—

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[348] Weber, *Economy and Society a New Translation,* 88.

[349] Jeffrey Alexander, *Theoretical Logic in Sociology: The Modern Reconstruction of Classical Thought: Talcott Parsons* (Berkeley: University of California Press, 1982); Cohen et al, "De-Parsonizing Weber"; Richard Hilbert, *The Classical Roots of Ethnomethodology* (Chapel Hill, University of North Carolina Press, 2001); Hans Joas, *The Creativity of Action* (Chicago: University of Chicago Press, 1996).

that Weberian and Parsonian action theory differ *radically*. In the next section, we will see how the same applies to Schutz's phenomenological rendering of Weber's interpretive sociology, which conventionally and particularly in the 1960s and 1970s with the development of ethnomethodology, was touted as an alternative to Parsons in post-functionalist action theory.[350] Schutz, like Parsons, ultimately flounders on the issue of probability, making the phenomenological departure from Parsons much less radical than traditionally thought.

Alfred Schutz and *Chance* as a Subjective Interpretation

Schutz attended Weber's lectures during the summer of 1918 in Vienna. While these lectures' content is not known, Schutz would shortly thereafter engage in a critique of what he saw as shortcomings in Weber's sociology, particularly regarding "subjective meaning." This suggests that at least some of what found its way into the first part of *E&S* was touched upon in these lectures.[351] For Schutz, this would subsequently lead him toward an intensive study of Husserl, eventually culminating in Schutz's first book, outlining the principles of his social phenomenology, in 1932.[352]

Notably, Schutz may have been one of the first "Weberian" (or self-described Weber-influenced) scholars to comment directly on Weber's probabilism, inclusive of the influence of Kriesian ideas.[353] Accordingly, in his discussion of the idea of causal adequacy in the context of Weber's probabilism, Schutz acknowledges that "the concept of causal adequacy was first advanced by the physiologist Johannes von Kries in connection with certain problems in the calculation of probabilities. He aimed to contribute to the theory of legal accountability in criminal law, but he introduced the idea as a general concept independent of any specific application."[354] In this respect, Schutz was at the very least aware of the primary source of Weber's probabilism. Nevertheless, Schutz demonstrates a limited understanding of the relevant concepts and radically underestimated (or willfully distorted) the overall influence and pervasiveness of Kriesian probabilism in Weber's sociology. Schutz seems convinced that Kries influenced Weber *only* concerning his conceptualization of the idea of causal adequacy, bypassing the overall influence of Kries on Weber's conception of *Chance*.

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[350] John Heritage, *Garfinkel and Ethnomethodology* (Cambridge: Polity Press, 1984).

[351] Helmut Wagner, *Alfred Schutz: An Intellectual Biography* (Chicago: University of Chicago Press, 1983), 14-15.

[352] Alfred Schutz, *The Phenomenology of the Social World* (Evanston: Northwestern University Press, 1967/1932).

[353] Ibid, 231ff.

[354] Ibid, 231.

Schutz reads and critiques the original *E&S* edition. Among his more evident engagements with Weber's text includes a similar encounter as Parsons with Weber's "relentless use of *Chance*." Specifically, Schutz calls Weber out by accusing him of a fundamental ambiguity, stated with what we can assume is a certain amount of frustrated exasperation: "*For whom does this probability exist—the actor, or the social scientist who observes him*?"[355] This, the perspective from which the "meaning" of the action is defined, was a constant theme in Schutz's reworking of what he perceived to be the many "equivocations" of Weber's conception of subjective meaning. For Schutz, "the subjective sense of an action is different for the actor him- or herself, for another person or for the scientist, and it also dif-fers based on different biographical knowledge and relevance systems."[356]

Accordingly, Schutz interprets probability in an exclusively epistemic or subjective sense, which means that probability only exists if an actor (or analyst) can recognize it. While this is less of an obfuscation than Parsons' rendering, what Schutz calls "objective probability" is not the same thing that Weber understood by *Chance*. Schutzian "objective probabilities" are the subjective probabilities imputed by a third-person (social-scientific) observer to others' actions.[357] For Schutz, the notion of objective probability as *externally existing chances* independently of any observer is utterly unimaginable; instead, "*[o]bjective* probability…is a category *of interpretation*." [358]

We can see the exact passages that Schutz misreads, however, which lead him to obscure Weber's argument. Schutz claims that Weber is inconsistent on probability by "advancing two contradictory views on the same page.[359] On the one hand, Weber seems to make probability "subjective" by emphasizing the presumptions made by a given actor about others in the context of a social relationship.[360] On the other hand, on the next page of *E&S*, Weber argues that "we (the observers) consider that a *Chance* exists or existed that, given the particular disposition of particular people, action will follow a specifiable path according to an averagely intended meaning—and no more." As Schutz points out, "these two situations are by no means identical. For it can hardly be said that, just because an observer can see a social relationship existing, therefore the participant in the same relationship will also be aware of it."[361] This statement only makes sense if we subscribe to the dichotomy that probability can either be subjective (first-person) or objective (third-person). However, Weber is not a frequentist, and so he does not subscribe to such a forced choice.

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[355] Ibid, 151-52 (italics in the original).

[356] Bernd Buldt, "Without Measure: Johannes von Kries' Legacy in the Field of Probability Theory" in *The Range of Science: Studies on the Interdisciplinary Legacy of Johannes von Kries,* edited by Gerhard Wagner (Berlin: Harrassowitz Verlag, 2019), 27-64, quotation is on p. 59.

[357] Schutz, *Phenomenology*, 153.

[358] Ibid, 237 (original emphasis).

[359] Schutz, *Phenomenology*, 237.

[360] Weber, *Economy and Society: A New Translation*, 104.

For Schutz, initially the solution to this problem lay in what he believed would be a completed phenomenology, a theme he would continue to pursue in later (unfinished) work, still heeding to a strict distinction between subjective and objective probability.[362] Ideally, this would mean that the subjective motivation of actors could be known because, based entirely on observation of outward behavior, an observer can retrace the same "noetic structures" that are presumed to be intersubjectively constant.[363] "Noetic structures," is a term taken from Husserl to refer to fundamental background conditions of the understanding. They assume the form of specific mental acts (e.g., observing, judging) enabling the construction of meaningful objects (generally defined to include objects of the imagination) and ascertainable "presences" (*noema*) in subjective experience. Importantly, this requires Schutz to collapse the distinction, thought by Weber to be of critical importance in his methodology, between "causal-adequacy" and "meaning-adequacy." However, Schutz could not stand by this distinction. For Schutz, causal questions had no place in phenomenological sociology:

> [T]he social sciences must reject the question of causality as inadequate in regard to the interrelations of their objects. The question of causality refers to the realm of mechanistic world explanations that will indeed – which can be shown a-priori – never be able to solve a single social-scientific problem, be it with the help of neurosciences, theories of psychophysical parallelisms or any similar theories.[364]

Schutz makes a similar statement while discussing the concept of causal-adequacy and its link to Max Weber's borrowings from Kries's probabilism:

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[361] Schutz, *Phenomenology*, 152.

[362] Alfred Schutz, *The Structures of the Life-World* (Evanston: Northwestern University Press, 1973), 39ff.

[363] Schutz, *Phenomenology*, 157.

[364] Schutz quoted in Thomas Eberle, "In Search for Aprioris: Schutz's Life-World Analysis and Mises's Praxeology" in *Alfred Schutz and His Intellectual Partners* edited by Hisashi Nasu, Lester Embree, George Psathas and Ilja Srubar (Konstanz: UVK Verlagsgesellschaft mbH, 2009), 497.

> [T]here are weighty objectives against the use of 'causal' in sociological discourse...when we formulate judgments of causal adequacy in the social sciences, what we are really talking about is not causal necessity in the strict sense but the...'causality of freedom,' which pertains to the end-means relation. Therefore, one cannot really speak of a casual relation in the general sense postulated by Kries so long as one confines oneself to the external event, the objective context of meaning and so forth.[365]

Departing from this bit of dogmatic aprioristic reasoning about the irrelevance of questions of causality for social explanation, Schutz is forced to deny the relevance of both objective possibility (*Chance* in the world) and its causal linkage to subjective probability in the explanation of action, as these are inherently tied to Weber's idea of causal adequacy. This means that something central to Weber's explanatory project—like the empirical linkage between expectations and *Chance* we will discuss in the next chapter—could play no role in Schutz's phenomenological reconstruction. Instead of causes involving probabilities, Schutz substitutes "meaningful" (non-causal) linkages between different phases of action (such as the intention to act and the resulting act), which are made to "cohere" experientially. The result is that "*[f]or Schutz, causal adequacy is only a special case of meaning-adequacy*."[366] More specifically, Schutz collapses the idea of causal adequacy into meaning adequacy despite Weber's efforts to keep these distinct.[367]

Schutz's reconstructed Weber is, therefore, far from the actual Weber; instead it is a phenomenological Weber, who while sometimes seen as a radical alternative to the functionalist Weber, ends up being as distorted a version of the original Weber as the Parsonian one.[368] This becomes typically visible in what "typifications" come to mean in social constructionism and interpretivist sociology and what ethnomethodologists generally conceive as "order."[369] In no case are these linked to probability, though in both cases the task is to deal with uncertainty. Because Schutz collapses probability into an interpretation, he cannot accommodate something like a partial belief or sign that would require a judgment of possibility.[370] The tendency and one common far beyond social science itself, is to assume that what is typical, "normal" or ordered implies something that is content-rich (a norm, "law and order", meaningful symbols) when it only requires a judgment of probability.

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[365] Schutz, *Phenomenology,* 231.

[366] Buldt, "Without Measure," 29.

[367] Weber, *Economy and Society: A New Translation*, 88ff.

[368] Hilbert, *Classical Foundations of Ethnomethodology*.

[369] Berger and Luckmann, *Social Construction of Reality*; Heritage, *Garfinkel and Ethnomethodology*.

[370] This, we would claim, is also where Schutz gets Husserl wrong. As noted earlier, Husserl did allow for judgments of possibility and probability, which would imply the partiality that typification omits. As we also suggested, there is at least some reasonable speculation that Kries' probabilism influenced Husserl in this regard (and in turn Heidegger). To our knowledge, Schutz never mentions Husserl's arguments about "judgment of possibility."

In rejecting Weber's probabilism, Schutz rules probability out of the lifeworld, though it often serves to build *de facto* "scientific models of human action." The result is a radical separation of the qualitative and quantitative, and the association of anything qualitative with the content-rich and anything quantitative with a form in *need* of that content. It becomes impossible to successfully navigate a potential space in between. To take just one example: we anticipate and "protend" (or "project" in more recent Schutzian terminology) the future—this much Schutz would agree with. He would also agree with this as being an experience-near kind of claim, with a lifeworld presence, and thus not requiring a scientific break from familiar recognition. But to say that this has any connection with the objective existence of probabilities that would diminish a subjective interpretation—this he rules out of hand.

A Tale of Two Translations

For Parsons, the problem seems to arise from the task of translation and the reinvention of meaning rooted in certain key terms, especially *Chance*. Schutz never tried to translate Weber, though as a native German speaker, Schutz was aware of the nuances of meaning, and when he dismisses Weber's probabilism as contradictory, this adds to the Parsonian mistranslation. We have alluded to the consequences of these engagements with Weber's probabilism and how seminal they have been to some of the most influential schools in twentieth century social theory. This tells us that translation matters, particularly of works with "classic" influence, and the very fact that, to date, only one translation could give Anglophone sociologists access to Weber's core text has arguably proven of the greatest consequence. So, what should we expect now that a new translation is available and Weber's reliance on *Chance* becomes available for all to see?

The departures between the Tribe translation and the Parsons and Henderson translation can be captured with just a few examples. In each of these what becomes clear is the "range of possibilities" relative to which Parsons could have made sense of Weber's text, which reflected the strategies with which Parsons envisioned the postwar institutionalization of social science, with its divisions and struggles for legitimacy, but also what remained conceivable for him as "probability."[371] The statistics profession had monopolized questions of probability by this time, and the tenuous status of scientific fields that are not fully quantifiable contributed even further to what Parsons could only judge as objectively *impossible* for Weber to mean, infringing as it does on an established discourse that wields symbolic power over sociology.

We can find evidence of this in a key part of the early pages of *E&S*, as Weber is developing his analytic framework for sociology around social action and orientation. Tribe translates this as follows:

> Simple 'imitation' of an other's action (the importance of this is rightly emphasized by G. Tarde) should not be conceptualized as specifically 'social action' where it is purely reactive, lacking the orientation of one's own action to that of the other. The boundary is so fluid that often a clear distinction seems impossible. The simple fact that a person adopts from someone else an apparently useful procedure is not social action in our sense. The action is not oriented to the behavior of the other, but the actor has, through observation of this behavior, become aware of certain objective *Chancen*, and it is to these possibilities that his action is oriented. His action is causally, but not meaningfully, determined by the action of others.[372].[5]

The Parsons and Henderson translation, meanwhile, goes like this:

> But furthermore, mere "imitation" of the action of others, such as that one which Tarde has rightly laid emphasis, will not be considered a case of specifically social action if it is purely reactive so that there is no meaningful orientation to the actor imitated. The borderline is, however, so indefinite that it is often hardly possible to discriminate. The mere fact that a person is found to employ some apparently useful procedure which he learned from someone else does not, however, constitute, in the present sense, social action. Action such as this is not oriented to the action of the other person, but the actor has, through observing the other, become acquainted with certain objective facts; and it is these to which his action is oriented. His action is then *causally* determined by the action of others, but not meaningfully.[373]

The key departure in these two bits of text comes in Tribe's translation of "*objektiv Chancen*" as "objective *Chancen*" while in the Parsons and Henderson text this becomes "objective facts." This is no minor difference. We emphasize it because the stated implication of an actor's capacity to orient to *Chance* is of pivotal significance for Weber's approach to social action (and his approach to concept formation more generally). Weber's action theory rests on such an orientation, as we will explain further below, and here he specifies how orientation as he understands it is different from imitation, and, furthermore, how this orientation to *Chance* (and not just to "facts" about the world) is meaningful, which Weber establishes in the very next sentence. We can only assume that Parsons and Henderson decided that an orientation toward something that lacked a definite form could simply *not* be what Weber meant. How could something like "chance" exist? It was only a weak knowledge claim.

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[371] Joel Isaac, *Working Knowledge: Making the Human Sciences from Parsons to Kuhn* (Cambridge: Harvard University Press, 2012), chap. 5.

[372] Weber, *Economy and Society: A New Translation*, 100-01.

[373] Weber, *Economy and Society*, 23-24.

For a second example, consider the following difference in translation in another key part of *E&S* where Weber discusses his concept of social order. Here is what we find in the Tribe translation:

> 'Orientation' of action to the validity of an order does not only imply 'adherence' to its (averagely understood) meaning. Even where this averagely understood meaning is 'evaded' or 'infringed,' it is likely that this validity will still, to some extent, remain effective as a binding norm.[374] .[6]

In the Parsons and Henderson translation, the previous comes out as follows:

> It is possible for action to be oriented to an order in other ways than through conformity with its prescriptions, as they are generally understood by the actors. Even in the case of evasion or disobedience, the probability of their being recognized as valid norms may have an effect on action.[375]

The difference is that when Parsons and Henderson translate this passage, they insert "prescriptions" and "norms" in places where these plural nouns appear to be the source of belief in a valid order. Tribe, by contrast, keeps the translation as "averagely understood meaning," which does not specify an exogenous source of belief, nor does it imply a normative binding conception of such an order. Instead, as once noted by Stephen Warner, a pure *cognitive* orientation to the existence of an order not necessarily considered *normatively* binding, and it can still deeply affect the elected course of action.[376]

Later in this same section, Weber argues that—in the Parsons and Henderson translation—"for sociological purposes, as distinguished from legal, it is only the probability of orientation to the subjective *belief* in the validity of an order which constitutes the valid order itself."[377] In the Tribe translation, this becomes "the *Chance* of orientation by a belief 'is' 'the' valid order."[378] In the Parsons rendering, this statement implies that exogenous factors like "norms" or "prescriptions" increase the probability for an orientation to subjective belief in a valid social order. In the Tribe translation, that belief is an objectively probable orientation to order *is* "'valid' order." Parsons renders this statement compatible with the priority of a cultural representation as the source of a subjective belief and ultimately of social order.

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[374] Weber, *Economy and Society: A New Translation*, 110.

[375] Weber, *Economy and Society*, 32.

[376] Stephen Warner, "Toward a Redefinition of Action Theory: Paying the Cognitive Element Its Due," *American Journal of Sociology* 83, no. 6 (1978): 1317-1349.

[377] Weber, *Economy and Society*, 33.

Tribe's translation suggests that the orientation in question can be "belief," but it does not have to be: belief does not have to be the form that subjective orientation takes. It can take this form within a particular probabilistic order: to be oriented by belief successfully loops in and the order is therefore capable of validity (and, we might assume, invalidity), at least to someone when their orientation *is* a belief. Thus, norm, prescription, law, convention, and belief all find their place not as something exogenous toward which one can be oriented, but as what orientation itself means *in social action*. By obfuscating the key role of orientation in Weber's text, Parsons makes it seem like subjective meaning is distinct from orientation, or prior to it. Weber proposes nothing like this, and in fact rarely uses the phrase "subjective meaning" in *E&S*.

After Parsons' Weber

At this point, we can say with confidence that the Weber generally known in sociology is not Weber the sociologists but, rather, Talcott Parsons' Weber, his own construct, and a version of Weber which, most consequentially for our purposes, puts interpretation and probability on opposite sides of a long dining table. Even if other commentators have written far more often on Weber, even if those like Schutz have offered influential interpretations, and even if Parsons is dead and his influence has significantly waned, Parsons still controlled the main point of access to Weber, as Weber's translator, at least until recently. Now that this point of access is no longer monopolized, it becomes clear how significant certain textual decisions have been for the development of 20th century social theory.

A sense of this monopoly power can be observed in one example, an attack on Parsons' Weber that is quickly diffused by, again, enlisting the authority of translation. In 1975, Jere Cohen, Lawrence Hazelrigg, and Whitney Pope wrote what was, at the time, a high-profile objection to Parsons' rendering of Weber's theory of action, arguing that Parsons gave too much attention to the impact that Weber believed normativity had on action by confusing normativity with "factual regularities," thereby distracting from corresponding forms of domination and other "non-normative influences" on action.[379] Parsons would subsequently write a rebuttal to this critique in which he tried to draw attention away from the interpretations included in *The Structure of Social Action* (published nearly 40 years before) and cover his tracks by admitting that while Weber accounted for a variety of influences on action, he (Parsons) merely sought to emphasize those that were distinctively "sociological" (e.g., "values" vs. "interests").[380]

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[378] Weber, *Economy and Society: A New Translation*, 111.

As one of many critiques of a powerful figure in a scientific field, this episode does not particularly stand out. Parsons had been and would increasingly be subject to criticism. Yet, this case serves as a textbook example of why Parsons' Weber could remain essentially impervious for so long in Anglophone sociology, despite clear evidence to the contrary. The critics, in this case, had to use Parsons' tools to dismantle Parsons' house. As Cohen et al. leverage "factual regularities" against normativity, their argument rests on Parsons and Henderson's own translation of Weber, particularly the part where they translate "objective *Chancen*" as "objective facts."[381] Thus, the critique takes place entirely on Parsons's own terms and according to his version of Weber's sociology, one where "objective *Chancen*" disappear and "objective facts" take their place. This is also a sociology where Weber conceives of probability in a now-standard epistemic or frequentist sense or, for those who might be more partial to Schutz's reading, can be forgiven for arguing that probability is simply one available way of interpreting action.

The purpose of rehearsing this tale of forgotten sociology lore is not only to reiterate why it matters that a new translation of Weber's core sociology text is now available, it also to show that contemporary social theory still lives in the shadow cast by idioms shaped, either directly or indirectly, by Parsons' (and Schutz's) Weberian misappropriations. The Weber who appears outside that shadow is preoccupied with the role *Chance* plays in social life in a manner likely to prove shocking for whoever encounters the text and had only been familiar with Parsons' Weber from the past.[382] Weber's

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[379] Cohen, Hazelrigg and Pope, "De-Parsonizing Weber"; Warner also develops this line of thinking, pushing the theory of action in a "non-normative" direction in "Toward a Redefinition of Action Theory."

[380] Talcott Parsons, "Reply to Cohen, Hazelrigg and Pope," *American Sociological Review* 41, no. 2 (1976): 361-65.

[381] Weber, *Economy and Society*, 24 n 18.

[382] As they likely would be from a graduate classical theory seminar, which maintains the *Chance* of that reading

"interpretive sociology" will remain incomprehensible to us without accounting for this. Without accounting for probabilism, we will continue making associations between Weber and interpretation as gaining access to meaningful content (e.g., an interpretation we place on an intrinsically meaningless world) with which to explain social action. At the very least, these concepts have little basis in what Weber argued and would seem to find little place in what he considered to be "*mein Soziologie*," which is consequential, with Weber ever the totemic figure in the cultural turn. To retain a commitment to Parsons' Weber, whether knowingly or not, closes social knowledge off to a road not often traveled (but for no good reason).

Legitimately, this effort could be dismissed as just another attempt to claim a new Weber among the many previous and ongoing efforts to do the same. Yet as Tribe suggests, the difference is that the known universe of possible Webers in mainstream social theory is still indebted to Parsons' normativist *cum* culturalist Weber, which outweighs and overshadows them all.[383] This is in no small part because when Parsons the translator came face to face with *Wirtschaft und Gesellschaft* and bore witness to its "relentless use of *Chance*," he pivoted and rendered Weber's usage out of bounds (e.g., "he couldn't *possibly* mean that!"). This demanded significant textual alteration, leading to persistent conceptual confusion to the present day.

Weber's conceptualization of "order" and its validity is a case in point. In *Structure*, Parsons tried to recruit Weber as a sociological savior, as one who provided part of the solution to Thomas Hobbes's "problem of order" and the basic question of why order was there to begin with. Unfortunately, Parsons misconceived the very nature of the problem, focusing on the presumed existence and maintenance of a non-empirical normative order when Weber had his eyes trained on a probabilistically conceived objective order rooted in *Chance*, the origins of which could not be prejudged to be premised on normative commitment. The consequences of Parsons' answer range far beyond sociology. We need to look no further than the wide-ranging, colloquial, and political use of "values."[384]

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as opposed to others. While the teaching of such seminars lacks centrality it once did to a graduate curriculum, the same maintenance of *Chance* through actual or potential reprimand remains essentially unchanged since the time of Parsons, Reinhard Bendix, Hans Gerth and other maintainers of the Weberian orthodoxy.

[383] Keith Tribe, "Talcott Parsons as Translator of Max Weber's Basic Sociological Categories", *History of European Ideas* 33 (2007): 212-33.

[384] John Levi Martin and Alessandra Lembo, "On the Other Side of Values," *American Journal of Sociology* 126, no. 1 (2020): 52-98.

A different and genuinely post-Parsonian (and non-phenomenological) Weber thus provides support for and allies with these other approaches to action that, among other things, provide a way to explain order differently. Because probability can be drawn more closely together with action and experience rather than, as it appears readily poised to do, pulled further and further away from it once fueled by data science prerogatives, this alternative envisions a way of fighting against that version of probabilism while present conceptions of action seem antique by comparison or fold altogether. In the chapters that follow, we outline what this alternative has been, in Weber and beyond, and then forecast what it could be.

Chapter 5 - Beyond Weber the Interpretivist: Rediscovering Weberian Sociology

> *Statues give only uncertain information about the empirically valid imposition of power that, finally, always rests on organizational consensus. For in truth the probability must be calculated in each case to which persons the compulsory members are likely to submit in the end; this probability is the decisive content of that "consensus" which forms the actual empirically valid "constitution."*
>
> ~ Max Weber, "Some Categories of Interpretive Sociology"

The task so far has been to give necessary background and preparation for the revisions and rediscoveries we will now recommend and undertake. Weber has been a victim of mistaken identity, as we have argued, made into an interpretivist or a cultural sociologist when he situated himself more within a tradition of probabilism.[385] By this point, the lost and heterodox brand of probabilism which Weber's sociology represents has had its veil removed; the light is now upon it. Likely, it remains enshrouded, however, this time by its own obfuscations. What could a probabilistic sociology mean? What did Weber do with it as he fine-tuned the concepts he drew from Kries?

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[385] While previously noted in scattered form by some commentators, Weber's probabilism has still not been given the treatment it deserves. In work published in English, Stephen Turner and Regis Factor in the 1980s stands as pioneering in noting the implications of the connection between Weber and 19th-century probabilism in Germany, most centrally the work of Johannes von Kries (Stephen Turner, "Weber on Action," *American Sociological Review*, 48, no 4 (1983), 506–519; Stephen Turner, *The Search for a Methodology of Social Science: Durkheim, Weber, and the Nineteenth-Century Problem of Cause, Probability, and Action*, (Dordrecht: Reidel, 1986); Stephen Turner and Regis Factor, "Objective Possibility and Adequate Causation in Weber's Methodological Writings," *Sociological Review* 29, no. 1 (1981): 5–28). Recent work by Fritz Ringer ("Max Weber on causal analysis, interpretation, and comparison". *History and Theory* 41, no. 2 (2002), 163–178; *Max Weber: An Intellectual Biography* (Chicago: University of Chicago Press, 2004); "Comparison and causal explanation," *Comparative Education Review* 42, no. 3 (2006): 363–376). Isaac Reed (*Interpretation and Social Knowledge* (Chicago: University of Chicago Press, 2011), 141 n37) has also taken note of Weber's use of the concept of "objective possibility" and reliance on Kries (following Ringer). Reed does not link Weber's probabilism to his interpretive sociology, instead referring to Weber's *Protestant Ethic and the Spirit of Capitalism* as interpretive sociology's signature example. Weber, however, does not appear to have explicitly linked his interpretive sociology to that text (for a similar observation, see Bargheer, "The Invention of Theory: A transnational case study of the changing status of Max Weber's Protestant ethic thesis," *Theory and Society* 46, no. 6 (2017):497-541). One surprising exception to a full treatment of Weber's probabilism comes from the (so far unnoticed) deep influence of Weber's probabilism in Pierre Bourdieu's practice theory (see Chapter 7). Bourdieu took notice of Weber's probabilism before Ralf Dahrendorf (mentioned in the last chapter), particularly objective Chance and the "decoding of objective intention," and used this as the staging ground for developing his own probabilistic sociology.

This and the following chapter contrast the image of Weber as a probabilistic theorist of social action rooted primarily in *expectation* against what is today the dominant picture of Weber as an "interpretivist" cultural theorist of webs of significance with which people cope with a meaningless chaotic world. This received view is rooted in a mistaken characterization of Weber's conception of objectivity and the roots of social action and order. At a metaphysical level, the contrast could not be starker: rather than chaos, the fundamental basis of the objective order that sociologists seek to understand is *Chance*. It is only because people orient themselves to *constructed probabilistic orders* that their action can be rendered interpretable. Accordingly, interpretation and meaningful action have a fundamentally different basis in Weber's sociology than they do in contemporary cultural sociology as neither of these core ideas can be disassociated from probabilistic concepts, like objective possibility, orientation, and judgment.

Taking Weber's systematic use of probabilistic notions seriously makes the contemporary taken-for-grantedness of the dominant picture problematic at best. In this chapter, we show that, for Weber, interpretation and probability are *allies* not antagonists.[386] This is evident in Weber's first full (and unfortunately last) statement of his sociology, where the notion of *Chance* is not an incidental extravagance or peripheral concern. Instead, it is the central resource for concept formation and for delineating a formal theory of action and the construction of social orders.[387] Nevertheless, the full implications of Weber's last statement on sociology, and how he built it on the foundation of *Chance*, have yet to be fully digested and taken into account.

Weber's version of *Chance*, as we have suggested, is only partially and poorly approximated in the contemporary uses of "chance," whether folk or statistical.[388] This has significant consequences for how we understand the conceptual foundations of Weber's sociology and how his work, immensely influential as it has been, has potentially radical implications for contemporary sociology by bringing interpretation and probability into a mutually profitable, rather than mutually exclusive, relationship. Because of its centrality in Weber's concept-formation, we wager that if you do not understand *Chance*, then the categories of Weber's interpretive sociology will likely elude you as well. These categories describe an objective order composed of "opportunities, probabilities, and risks" people face at every turn, as they orient themselves in an uncertain world, which they can guess and judge.[389]The objectivity of this order is not exogenous. Instead, objective order is continuously constructed from anticipatory action shaped by probabilistic expectations. For Weber, the interplay between *Chance* and subjective expectations—what we have called looping in—-generated when people orient themselves is ultimately productive of whatever factual order we can observe and measure.[390]

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[386] This antagonism is axiomatic in contemporary sociology, mapping onto various methodological distinctions such as qualitative versus quantitative, statistics versus words, or meaning versus prediction. Randall Collins, "Statistics versus Words," *Sociological Theory* 2 (1984): 329-362; Duncan Watts, "Common Sense and Sociological Explanation," *American Journal of Sociology* 120, no. 2 (2014): 313-351.

[387] This was the only section of Weber's presumed magnum opus whose finished proofs Weber checked and revised before his untimely death in 1920. Notably, the German word "Chaos" drops out of the *E&S* text, though it plays a significant role (as we expand upon below) in Weber's earlier work. See Max Weber, "The 'Objectivity' of Knowledge in Social Science and Social Policy" in *Max Weber: Collected Methodological Writings*, edited by Hans Henrik Bruun and Sam Whimster (London: Routledge, 2012/1904), 117-118.

[388] Michael Sauder, "A Sociology of Luck," *Sociological Theory* 38, no. 3 (2020): 193-216.

As a sociological statement, this means that people "construct" social orders through looping effects that organize and orient what they judge possible, as the different constitutive and organizing capabilities of "conceptions of order," rules, consensus, and reprimand are maintained and administered by organizations, associations, and agreements. These are holds on the future, creators of duration. Even a promise to one other person leaves us oriented by the range of possibility opened in that instant, when we spoke the words and petitioned for their trust. The looping effect of expectations into *Chance* makes *more* social action than could otherwise be discerned: very simply, it becomes possible to act to either keep or break the promise. The future appears to us in the form of expectations, about what should happen or what is probable; the movement is from past to future, and only then do we perceive the present. Rationalized orders and formations of power feature the same looping process of *Chance* and expectation as more or less extensive distributions of probability that appear of longer durations and wider spatial spread, generating more expectation, creating more social action, perhaps even appearing truly *general* and coinciding with seemingly all actions, instants, and people. Typically, orders of this sort cannot be built entirely on promises, though "legitimate" order, if we are to believe Weber, depends on something quite like a promise.

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[389] Keith Tribe, "Introduction" in *Economy and Society: A New Translation* (Cambridge: Harvard University Press, 2019), 65.

[390] Throughout this chapter, we capitalize the probabilistic terms "Objective Possibility," "Objective Probability," and "Adequate Cause" to emphasize them as technical, analysts' terms, or ways to understand and infer "the existence of specifiable Chance," and not to confuse them with empirical objects we can directly observe, such as subjective expectation qua anticipations of sanction for breaking written rules.

In the remaining, we will show how a looping approach to connecting the objective and the subjective has a family resemblance to other constructionist arguments for the emergence of social orders. Notably, however, Weber's probabilistic version of constructionism is distinct from the most influential contemporary versions of such an approach with the difference revolving once again around the presumed object of people's orientation.[391] For Weber, to construct a social order involves specifications of *Chance* as looped into by corresponding expectations; for traditional social constructionists, a non-probabilistic institutional order is built instead on sedimented typifications, the order comprising inferences from the *content* of these types. From the probabilistic perspective, the dynamics of social action are best understood, instead, by reference to probabilistic expectation.[392] The typicality, riskiness, or improbability of social action are observations on probability independent of tabulated frequencies. The punchline is that those frequencies are *not* objective, while these judgments of probability *are* objective.

In this chapter, we first bring into question Weber's link to interpretivism, then we will unpack the basic aspects of his probabilistic sociology, moving from *Chance* to orientation, and finally what this all means for the explanation of social action.

Was Weber an Interpretivist?

The Weber who emerges from our analysis contrasts sharply with Weber as a straightforward advocate of "interpretivism"—in various ways this has been understood—a received understanding unchallenged in contemporary sociology. In the interpretivist view, Weber is a theorist of subjective meaning, for whom culture serves as a finite segment of signification tenuously carved out of the inherently meaningless infinity of a chaotic universe. One of Parsons' last—and retrospectively one of his most deft—intellectual moves was to bequeath us a "cultural Weber" that could, without too much distortion, be anachronistically retrofitted into the analytical culture concept he played such a pivotal role in systematizing.[393] As mentioned in the last chapter, this is only one of the many sociological Webers surviving until now, but it is the most important version of Weber, acquiring prominence over other contenders with the rise of various flavors of cultural sociology in the American scene.

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[391] Peter Berger and Thomas Luckmann, *The Social Construction of Reality* (New York: Anchor, 1966).

[392] Max Weber, "Some Categories of Interpretive Sociology," *Sociological Quarterly* 22, no. 2 (1981): 153-181, quotation is on p. 178. Max Weber, "Science as a Vocation" in *Max Weber: Collected Methodological Writings*, edited by Hans Henrik Bruun and Sam Whimster (London: Routledge, 2012/1919), 350-51; Max Weber, *Economy and Society: A New Translation*, translated by Keith Tribe (Cambridge: Harvard University Press, 2019/1921-22), 104.

Should we seek the basic elements comprising the cultural Weber, Clifford Geertz offers what remains the most vivid and ultimately influential picture.[5] Geertz's Weber is one for whom "all experience is construed experience and the symbolic forms in terms of which it is construed thus determine…its intrinsic nature."[394] "The problem of meaning" features a telling counterfactual, where we are asked to imagine the sort of formless monster a culture-less human animal would be. According to Geertz, "[u]ndirected by culture patterns—organized systems of significant symbols—man's behavior would be virtually ungovernable, a mere chaos of pointless acts and exploding emotions, his experience virtually shapeless."[395] Thus, people set upon a quest for meaning, responding to an "opaque" reality, "a chaos of nameless things and thingless names," teeming with "specifically senseless experience."[396] Geertz, in particular, makes this Weber's fundamental view, moving directly to the problem of meaning as the essential condition of interpretive sociology.

Accordingly, for contemporary sociology's cultural Weber, with its strongly Geertzian provenance, the predetermined existence of cultural patterns both ground and justify analytic acts of interpretation, whose validity and existence are thereby established. To interpret action, analysts "orient" themselves to the cultural patterns and significant symbols the people whose actions are being decoded presumably also orient themselves to, thus placing folk acts and discourses in a maximally interpreted meaning landscape.[397] Today, the elements of this cultural Weber largely dictate how sociologists read and understand Weber's "interpretive sociology."

Nevertheless, seeing Weber's main contribution through this culturalist lens hinges on accepting an implicit metaphysical claim, as we have alluded to and which is often but mistakenly attributed to Weber: namely, that the objective reality people face is *opaque*, *chaotic,* and *meaningless*, and thus, first and foremost, an interpretive must be cast over its abyss to act at all. As projected onto Weber's sociology, such a "metaphysics of meaningless chaos" is largely off the mark. The presumed "opaque" world finds a much more exacting reference in Weber's sociology as *Chance* —which, following Kries, is understood to be different from indeterminism, randomness, or incoherence. In this world, the potential for chaotic dissolution from a subjective standpoint is less a matter of the prevalence of "nameless things" than it is of *unexpected events* or the appearance of an opaque probabilistic order that does appear objective to us because we cannot loop into it or anticipate it; we are incapable of action: possibility is made actual, but as a constant surprise to us.

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[393] Talcott Parsons, "Culture and Social System Revisited," *Social Science Quarterly* 53, no. 2 (1972): 253-266; Adam Kuper, *Culture: The Anthropologist's Account*, (Cambridge: Harvard University Press, 2000), 47ff; Omar Lizardo, "Cultural Theory" in *Handbook of Contemporary Sociological Theory*, edited by Seth Abrutyn (New York: Springer, 2016), 99-120.

[394] Clifford Geertz, *Interpretation of Cultures* (New York: Basic Books, 1973), 405.

[395] Ibid, 46.

[396] Ibid, 105. Stated slightly differently, Weber is a "*verstehende* theorist of tragedy, whose actor [is]…oriented to problems of cosmic meaning," Stephen Warner, "Toward a Redefinition of Action Theory: Giving the Cognitive Element its Due," *American Journal of Sociology* 83, no. 6 (1978): 1317-1349.

[397] Isaac Reed, *Interpretation and Social Knowledge* (Chicago: University of Chicago Press, 2011).

In this way, Weber incorporates an unconventional approach to probability into sociology, bypassing what is widely believed to be essential to use probability for analytic purposes. In the standard account, as we have portrayed it, probability requires a numerical recording and frequency counts to enable a familiar kind of epistemic statement to be made (e.g., *X* will occur with a chance of *p*; *Z* is more likely to happen to *Y* than to *X*; the conditional probability of A happening given that event B happened is *q*). For Weber, by contrast, *Chance* exists in the world, and while our expectations are immaterial when it comes to "natural events," they are not for situations in which we "can expect subjectively meaningful behavior from others … that [we] can thus predict, with varying degrees of accuracy the probability arising from certain *meaning* relationships."[398]

Here, Weber engages in a rather unorthodox use of probabilistic language (predict, probability, degrees of accuracy), in addition to distancing himself from more conventional arguments about neo-Kantianism. From this perspective, "objectivity" does not enter the analysis as frequency counts or real numbers, nor for that matter, as an exogenous rational standard or metaphysics of presence. *Chance* is not a Kantian "thing "in-itself" standing behind phenomenal appearances but consists instead of what our anticipatory or predictive pattern-recognition latches onto or loops into in a form not dissimilar from making a *successful* guess, with which we can feel greater or lesser confidence, even though what we guess will always ultimately elude us in its knowability. The social world, as people experience it, is *inherently* probabilistic rather than probabilistic as a by-product of the scientist's calculation. Furthermore, probabilistic dimensions of social experience are integrally linked to its interpretive dimensions, not rigidly separated from them.

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[398] Weber, "Some Categories," 159.

To interpret, for example, whether someone cheats at a card game, we need to find their orientation to the rules, how they judge the probability of those rules not applying, and how they knowingly break them. But even to put the focus on interpretation in a conventional sense, of meaning-making, the *Chance* becomes most pronounced in orientation to that which stands as an object in relation to us. This could be because it is new to us, but not new in general; or it could be the latter. When we must orient to what lacks history, to loop into it, we must give it an interpretation; each new meaning given can be read during action, as by interpreting we are *creating* possibilities that we can then make actual (we don't inherit those possibilities within a range). We are motivated to interpret, in this case, for reasons that have to do with a probabilistic order: to make time move and create a future, in other words, as without an orientation, we could project nothing further than the immediate moment.

Orientation, here, in a manner akin to Kries, is the fundamental element of Weber's version of looping in: it is how we stand in relation to anything else as an object, and it brings out our subjectivity as a result. But if we interpret to loop in, this tells us that interpretation gives us some control over what we are oriented to. It is not like a game of chance, in this case, as objective probabilities we can measure but remain opaque to us, and our action is more akin to rolling the dice. But even when we interpret this we are not typically freed of an orientation to the expectations of others, unless, that is, we are oriented entirely to "conceptions of order" inside our own head. Even meaning-making has a probabilistic aspect, which means that it offers a testing space that will change it: this is the perception of *Chance* that involves either or both our orientation that needs meaning and our orientation to the expectations of others as we *make* meaning. Our worldviews can be entirely private, but they might not be good for anything, as they will be tested by nothing except our imagination. Nothing will stand as an objective probability to them; they will loop us into nothing and make no possibilities actual for us, though, as Bourdieu told us earlier, it is difficult to break our intuitions (or habitus, as we articulate below) of what is probable for us, even when we fantasize.

All of these are sketches, of course, and abstractly stated. But the guiding idea, here, is that it does not take extensive empirical findings to show that probability and interpretation are not opposites: their close relationship is already implied by many conventional uses of interpretative analysis. Thus, probability, far from being its antithesis, can actually be a royal road to interpretation.

A Different Formula for Social Construction

Probabilism applies to the construction of the social world through novel looping effects, and for Weber, the study of these effects makes sociology distinct among the sciences of action. Weber famously argues sociology's particular concern is *social* action.[399] But this is not just a definitional or stale typological claim. Instead, it is a probabilistic claim attached to the kind of constructionism Weber believes sociology must take as axiomatic. Action can be patterned according to predictions of "natural events," but this does not account for how we "predict" others' expectations, coordinating with our actions. Social action, by contrast, consists of *orientation by expectation* as a looping effect into the "existence of a (specifiable) *Chance*."[400]

Such a framework constitutes a radical departure from currently conventional meanings of objectivity and probability. This departure could very well be dismissed as "subjectivist" because it seems to only tell us about a degree of belief based on personal experience without further extrapolation. Yet, Weber's probabilism cannot be so easily fitted into the usual categories of "subjective" and "objective." To follow Weber, we must bracket our received understanding of these categories. The resulting "reshuffling"—encoded, as we explain below, in the image of a "loop" linking the objective and the subjective—leads to a distinct grammar of action. Regardless of what an orientation might specifically be, its presence in social action will construct orders and institutions via *recurrence* and *repetition* as durable looping effects. In this respect, Weber's probabilistic approach bears a family resemblance to some contemporary arguments positing a similar looping relation between action and objective order, like structuration or field theory.[401] Nevertheless, we argue that there is a specific difference between Weber's approach and the most influential and well-established constructionist approaches today. This difference is rooted in their divergent understandings of how action acquires a socially constructive capability.

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[399] Weber, *Economy and Society: A New Translation*, 178.

[400] Ibid, 87. On these points, it is worth mentioning the influence of Nietzsche on Weber, with the former finding an "ancient, Chancy universe" without a final state, in contrast to the seemingly settled (or slowly settling) universe, conducive to a priori categories, presented by German idealism. See Gilles Deleuze, *Nietzsche and Philosophy* (New York: Columbia University Press, 1983/1962), 25ff; Eugene Fleischmann, "De Weber à Nietzsche," *European Journal of Sociology* 5, no. 2 (1964):190–238.

[401] Anthony Giddens, *The Constitution of Society: Outline of a Theory of Structuration* (Berkeley: University of California Press, 1984); John Levi Martin, "What is Field Theory?" *American Journal of Sociology* 109, no. 1 (2001): 1-49.

In classic "social constructionism," people orient to typifications—sometimes durably institutionalized—to produce meaningful, interpretable action. Lines of action falling outside established typifications are rendered meaningless and uninterpretable. Typification, in turn, is a matter of representational schemes constitutive of stocks of "everyday knowledge."[402] Typifications are arranged on a continuum: on one side, there are highly concrete ones used to organize interaction with intimate and significant others (e.g., "my best friend"); on the other side, there are those structuring our understanding of anonymous or abstract realms removed from direct experience (e.g., "the government"). In this approach, "social structure is the sum total of these typifications and of the recurrent patterns of interaction established by means of them."[403] A similar, more interpretive concentration on "schemas" uses the equivalent of "reading" to account for the "mutually sustaining relations'" between interpretive schemas and worldly resources routinely producing social structures.[404] Like typifications, schemas create structural order by preventing dissolution into nameless, chaotic opacity.

For both the constructionist and the structurationist, connecting cognition and the reproduction of social order requires solving the problem of how anything can be constructed from a world that lacks any apparent meaning.[405] By way of contrast, a serious consideration of *Chance* forces us to move beyond these conventional parameters by removing the need to bridge the abyss between meaningless opacity and meaningful action. The presence of rules or laws, for example, mean that people's probabilistic expectations are secured, as they become subject to durable looping effects that ensure (as much as possible) that not just anything can happen.[406] Strict sanctions penalize action the rules make improbable, but even "informal" or "spontaneous" orders built on promises, where rules are not strictly codified or remain in the tacit dimension, are also structured by an orientation to the typical, the expected, and the probable. For Weber, both "rational" spontaneous orders like markets and "customary" or conventional spontaneous orders like language, are built on common orientations to the probable:

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[402] Berger and Luckmann, *Social Construction*, 45ff.

[403] Ibid, 48.

[404] William Sewell, "A Theory of Structure: Duality, Agency and Transformation," *American Journal of Sociology* 98, no. 1 (1992): 1-29, quotation is on p. 13.

[405] As Berger and Luckmann (*Social Construction*, 51) note "the institutional order…is continually threatened by the presence of realities that are meaningless in *its* terms…the institutional order is…faced with the ongoing necessity of keeping chaos at bay."

[406] Weber, "Some Categories," 160ff.

> The existence of a "language community" does not mean … that there is a mass conditioned similarity in the production of certain sound complexes (that is not at all necessary) nor only that one 'imitates' what others do; rather, it implies behavior through "expressions," behavior meaningful oriented *toward certain average probabilities of making oneself 'understood'* within a group and therefore the actor "may" ordinarily also expect this meaningful result.[407]

People thus have specific expectations because they can be oriented to the probability that a set of linguistic expressions will recur and repeat instead of remaining single events that never return.[408] Everything hinges on the existence of "average probabilities" both in the production and reception of linguistic expression.[409]

In Weber's probabilistic sociology, then, the primary contingencies in social action and observed social orders are cognitive, but not as stocks of knowledge or content-laden schemas. Rather, the "cognitive basis" of social order refers to probabilistic expectation as the interface with *Chance* in recurrent loops. Weber's probabilism trades typification and schematic naming for "objectively correct" modes of action, rooted in and reinforcing "valid" judgments of possibility. Here, typicality refers to the expectations that are chronically present in social action 155.[410] Possibilities and probabilities are not to be confused with biological, physical, or geological inevitabilities (e.g., occurring independently of expectations), nor with aggregate statistical patterns. Without looping into subjective orientation to enlist social action, *Chance* will not enter into probabilistic construction nor yield interpretable action.

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[407] Ibid, 168.

[408] Weber, *Economy and Society: A New Translation*, 167-68.

[409] Of course, a "linguistic academy," can arise via a planned association of people, imposing explicit "rules" of linguistic expression (as with the *Académie Française*). This constitutes a transition from "consensual" to "associational" action (Weber, "Some Categories," 171). Nevertheless, the underlying probabilistic situation does not change—speakers are still oriented to Objective Possibility—but the mechanisms accounting for predictability and shaping such possibilities are different. In the first (consensual) case, an orientation to *Chancen* generated by the decentralized action of a multiplicity of people; in the second (associational) case, an orientation to objective possibility generated by the common meaning attached to the rules by others and the probability that they will continue to take the rules into account. Note that Weber would allow for orientations to multiple orders at the same time, so that today, we can say that French speakers, in their routine reproduction of the French language, consensually orient to the objective possibilities generated by both the decentralized community of all French speakers *and* associationally to the objective possibilities generated by the explicit rules of the *Académie* (Weber, "Some Categories," 162).

[410] Weber, "Some Categories," 155; A relevant contrast in this regard is flirtation, for which possibilities are deliberately kept open and never "actualized" in a way that would exclude some from looping into our orientation; Iddo Tavory, "The Structure of Flirtation: On the Construction of Interactional Ambiguity," *Studies in Symbolic Interaction* 33 (2009): 59-74. The same is not true for the social relationship involved in "making music together," at least should we find the presence of musical notation. Once that loops into our orientation, it dictates what *should* happen next, and what is and is not possible; Alfred Schutz, "Making Music Together," *Social Research* 18, no. 1 (1951): 76-97.

Weber's interpretive sociology describes the construction of social order as the maintaining and shaping of loops via probabilistic expectations. What sociologists use to refer to a constructed order, like rules and laws characteristic of "organizations," the norms that dictate "associations," and spontaneous orders characterized by "consensus," even conceptions of order, among others, consist of orientations toward the probable or possible in action. Without the looping relation, action must consist of an inward ("subjective") orientation with a comparatively small "area of expectations" on which people can scaffold their engagement, especially when it involves others. More generally, actions that loop into no "established order," and that do not feature expectation, are improbable outside exceptional circumstances.[411] Weber's interpretive sociology does not embed social action in an "opaque" world needing interpretation. Instead, social action is interpretable to the extent that it orients to a *Chance* world constructed as predictable, expected, and typical.

Orientation, *Chance*, and Interpretation

As might already be apparent, a pivotal concept in Weber's interpretive sociology is *orientation*. This concept is distinct from textual interpretation or even conceptual representation. Instead, it is based on position and location in space and time. Weber refers to "orientation" repeatedly in developing his probabilistic sociology in both the *Logos* essay and the completed first part of *E&S*, using it more often and more consequentially than "subjective meaning."[412] Orientation is pivotal in defining the core concept of social action, given its link to objective *Chance*:

> Simple 'imitation' of an other's [*sic*] action (the importance of this is rightly emphasized by G. Tarde) should not be conceptualized as specifically 'social action' where it is purely reactive, lacking the orientation of one's own action to that of the other. The boundary is so fluid that often a clear distinction seems impossible. The simple fact that a person adopts from someone else an apparently useful procedure is not social action in our sense. The

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[411] Weber, "Some Categories," 160.

[412] Weber, "Some Categories," 153, 159, 162ff, 169-70; Weber, *Economy and Society: A New Translation,* 78-79, 88, 100-101, 103ff; see also Tribe, "Introduction," 78 n8.

> action is not oriented to the behavior of the other, but the actor has, through observation of this behavior, become aware of certain objective *Chancen,* and it is *to these possibilities that his action is oriented* (italics added).[413]

For Weber, there is a fine line between imitation (as evident in the work of French sociologist Gabriel Tarde) and orientation. As Weber notes, the difference is that orientation is both meaningfully and causally adequate, as an "orientation to possibilities," while imitation is simply causally adequate, as an orientation to the concrete behavior of other people. For the imitator "action is causally, not meaningfully, determined by the action of others. If, by contrast, the action of another is imitated because it is 'fashionable' or is considered to be traditional, exemplary, socially 'proper' or anything similar, then meaning is oriented to the behavior of the source of imitation, or to that of third parties, or to both."[414] Action is "meaningful," has "intended meaning," and appears as "social action," because it is oriented to the same "source" of meaning to which other people also orient their action.

In this formulation, social action is meaningful because it rests upon a subjective orientation. However, we should not assume the reference to subjectivity here necessarily implies orientations to "cultural representations" or "webs of significance." Subjective orientations have their counterpart in "specifiable *Chance*" not abstract cultural patterns or systems of ideas. Weber emphasizes how "cognition" plays a role in the orientation process by providing evidence "from experience" that a given pattern does exist and "'statistical estimation' will ultimately express its 'general validity.'"[415] For Weber, "causal adequacy" is signified by a "sequence of events where it is known from experience that there is the *Chance* that the sequence will always occur in the exact same manner." Meaningful adequacy, meanwhile, revolves around the "existence of a (specifiable) *Chance* that action does tend to follow a meaningful course with specifiable frequency."[416]

Reading the definitions of causal and meaningful adequacy side by side reveals their common source in Weber's probabilism in a way that has not yet been sufficiently accounted for, even though bringing interpretation and cause together remains the gold standard of interpretivist sociology. The only way to coherently join meaning and causation is to follow Weber in constructing a probabilistic explanation of social action. The difference between meaning and subjective meaning "would be a redundancy in Weber's sense"[417] not because all meaning is "subjective" as the interpretivist reading of Weber assumes, but because meaningful action is accessible to observers as an objectively verifiable subjective orientation arising in contexts subject to looping effects.[418] The "contextualization" that references this "existence of a (specifiable) *Chance*" puts "action into a larger, potentially interpretable framework."[419] The empirically observable presence of typical action, then, indicates the construction of a space of possibility in which subjective and objective align, expectations loop into chances, and social action is enabled.

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[413] Weber, *Economy and Society: A New Translation*, 101.

[414] Weber, ibid.

[415] Ibid, 87

[416] Ibid, 87

Using this approach, sociologists can account for "adequate cause" without resorting to reductive individualism, the "personification" of collectives—with self-acting properties—like the "state," "companies," "charitable foundations" and the like, or the implicit determinism of Millsian necessary and sufficient conditions.[420] The interpretive sociologist makes her inferences by focusing distinctively on "expectations held subjectively...expectations formed on the basis of valid experience." The more "unambiguously" action has this kind of "orientation," the "less the meaningful intelligibility of its course can be enhanced" by reference to any alternative non-social influences. Among these last Weber includes psychology ("psychic data"), biology ("hereditary influences"), and the law ("legal dogmatics"). Probabilistic "expectation" becomes the main influence.[421]

Accordingly, the following phenomena are, for sociology, to be related on a "gliding scale" of consideration:

> ...(1) the objectively correct type, approximately attained; (2) the (subjective) instrumentally rational type; (3) behavior only more or less conscious or perceived and more or less unambiguously instrumentally rational; (4) behavior that is not instrumentally rational but is in a meaningfully understandable context; (5) behavior that is motivated in a more or less meaningfully understandable context, a context more or less strongly interrupted or codetermined by unintelligible elements; and finally, (6) the wholly unintelligible psychic or physical phenomena

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[417] Tribe, "Introduction," 78.

[418] This is particularly clear in how Weber uses the quoted phrase "judgment of objective possibility." He does so in 1905 to explain adequate causation. He repeats this same quoted phrase elsewhere too ("Some Categories," 159; *Economy and Society: A New Translation*, 86). As far as anyone can tell, this quoted phrase comes directly from Kries. See Helmut Pulte, "Johannes von Kries's Objective Probability as a Semi-Classical Concept: Prehistory, Preconditions and Problems of a Progressive Idea," *Journal for General Philosophy of Science* 47, no. 1 (2016): 109-129.

[419] Weber, *Economy and Society: A New Translation*, 85.

[420] Weber, "Critical Studies in the Logic of the Cultural Sciences," 182; A criticism of John Stuart Mills' method of agreement and difference was baked into Kries' revision of probability. See John Maynard Keynes, *A Treatise on Probability* (London: Macmillan, 1921), 275-76.

[421] Weber, "Some Categories," 154.

> "in" and "about" a person."[422]

In this rendering, the first type refers to social action that is oriented through looping into constructed social orders, recreating what is "typical" almost perfectly, not least because people can know what is typical and expected. The second type shares this orientation is likewise social action, but includes a high dose of subjectivity in what the interpretive sociologist can read as strategic—using the typical to act untypically, say, by cheating or pursuing self-interest—or as non-specifiable *Chance* (for example, untypically experiencing "a unique generalized feeling of love" in connection with a "belief in predestination") that might indicate an orientation to a different constructed order. The third type features a less consistent probabilistic orientation than the first two because typicality and expectation are not (and perhaps cannot be) explicit and known; people are subject to looping effects but are not consciously aware of them. The fourth type includes meaningful action not yet incomprehensible because the "meaning" found can be objectively possible, even if this comes only by way of an analyst's interpretation. Importantly, this identifies action *outside* a constructionist loop because while meaning is present, it does not take form as expectation. The fifth and sixth, meanwhile, feature expectations directed towards phenomena not constructed by those expectations; here looping effects are absent from the events that occur.

Weber is skeptical of such clean breaks between types when constructions of possibility feature a mix of social and non-social elements of action. Distinctions between orientations are always "fluid" and bleed continuously into one another.[423] As an analytic method, inferring adequate cause relies on comparison classes between "social action" featuring probabilistic expectations versus "action" that does not feature them. Adequacy, in this sense, refers to an explanation that successfully captures looping effects.

Weber takes note of how people make probabilistic comparisons without needing explicit knowledge of probabilities. This involves "[counting] on the order-oriented behavior on the part of others, just as, on average, [people] regulate their own action according to the same kind of expectation held by others."[424] Implicit to this orientation are expectations about what would happen if one did *not* orient their action in this manner and *not* act to maintain a constructed order as expected. Someone can expect, for instance, what will happen if, "in a commercial economy, the orientation of activity is [*not*] on the part of autocephalous individual economies" that "budget according to the marginal utilities of money and take advantage of market *Chancen* in the gainful conduct of enterprise in terms of capitalist calculation."[425] The consequences are so predictable, Weber argues, that this serves as the "deciding motivation of all economic action under commercial economic conditions," thus making all economic action into social action because it only has *these* possibilities.[426]

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[422] Ibid, 156.

[423] Weber often uses the term "fluid" in *Economy and Society* to characterize movement between and blurring of distinctions between abstract types. See Weber, *Economy and Society: A New Translation*, 100ff, 109-110, 125, 129, 159, 163f, 221, 361, 399, 451.

More generally, action can have a "consciously chosen" adequate cause, but only where this does not presuppose an additional orientation does it engage *Chance* in a manner *not* conducive for social construction. None of these points vary between the more familiar instrumental, value-rational, emotional, and traditional types, all of which can enter loops of probabilistic construction.[427] What matters is whether we are talking about social action (captured by a loop) or action (not captured). As Weber puts it:

> The possible (subjectively intended) meaning of social action clearly is not exhausted, for example, by orientation particularly toward the "expected action" of others. In the limiting case, action related to others can be oriented solely toward the subjective "value" of its meaning as such ("duty" or whatever); the action then is oriented not toward expectations but toward values. Similarly, "expectations" need not refer to actions of others but can also refer simply to inner states of others (such as "joy"). There is an empirically fluid transition from the ideal type of a meaningful relationship between one's own action and the meaningful behavior of others to the case where another person (perhaps an infant) is considered only as an "object." Action oriented toward expectations of meaningful action is, for us, only the rational limiting case.[428]

Thus, social action can be oriented by a typical emotional response, in which case that emotional response will be adequately caused by a probabilistic expectation. Anything, this suggests, can be made typical, and therefore expected, though actors might also not notice it, and not feature probabilistic expectations in acting accordingly. One can, for instance, be oriented by a moral value and take no account of the expected behavior of others in such an orientation. The main variations here are recognizably constructionist: first, whether *Chance* has been constructed into durable probabilities and, second, whether they loop into social action as expectation.

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[424] Weber, "Some Categories," 162.

[425] Weber, *Economy and Society: A New Translation*, 204.

[426] Weber, "Some Categories," 172f.

[427] Weber, *Economy and Society: A New Translation*, 101f.

[428] Weber, "Some Categories," 160.

In Weber's view, sociology shares "action" as a topical focus with other disciplines like law, psychology, history, and natural science.[429] The discipline's distinct advantage, however, hinges primarily on finding constructions of *Chance* as adequate causes of observable action. That social action is "adequately caused" when it more closely approximates what has been constructed as objectively possible can mean that it features a probabilistic expectation alongside "clearly perceived ends and … means consciously chosen as 'adequate.'"[430] If we find persons no longer orienting to specifications of *Chance*, or if certain expectations are disappearing entirely, then we can infer the disappearance of a constructed order. Loops can break down, thus orphaning social action, and rendering it less interpretable as it assumes more subjectivity simply as action.

A key implication of the foregoing, then, is that for Weber, probability and interpretation presuppose one another, such that there can be no interpretation without taking probabilistic expectation into account. We should favor consulting statistical frequency tables over interpretation only when objective probability fails to find a corresponding subjective orientation, mainly because it involves a probabilistic order that does not need our expectations to occur.[431]

Chance and Contingency as Conditions of Meaningful Action

The link between orientation, expectation, and specifiable ranges of *Chance* are clear in Weber's discussion of how, "[i]n one and the same act, the individual can naturally, therefore, participate in a number of kinds of social action":

> A business deal that someone executes with X, who has power of attorney from Y, who may in turn be an "agent" of a voluntary association, includes (1) a verbal and (2) a written association, (3) an exchange association with X personally, (4) another with Y personally, (5) another with the action of those participating in that voluntary association; (6) and the business deal is, in its conditions, co-oriented toward expectations of the potential action

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[429] See especially Weber, "Some Categories," 154-160 and Weber, *Economy and Society: A New Translation*, 99ff.

[430] Weber, "Some Categories," 155.

[431] In Weber's (*Economy and Society: A New Translation*, 88) examples, "events lack[ing] meaning" include things like mortality, fatigue, rainfall.

> of other exchange partners (competitors from both sides) and toward the corresponding consensuses on legality, etc.[432]

While the "consciously chosen" ends and means consist of the business deal itself, this highlights the probabilistic environment in which the act unfolds, specifically what a social actor must be oriented to make the deal. As we go further down the list, we ultimately reach "consensus on legality," which suggests that if personal associations and written associations are the source of expectations, behind these there is a framework of rules. However, these do not directly dictate action in an "objectively correct" sense. Rather, according to Weber, the consensus implicit to the parties involved in the exchange is oriented toward those rules, even if knowing those rules offers little in the way of interpreting social action in this context.

At all these junctures, certain possibilities are made objective, or are given an "objective validity": we must loop in because not just anything can happen and not just with anyone. Expectations form on these grounds, such that the business deal can happen. The absence of predictability is evident in contrast cases: "it is especially marked in cases like that of the subduing of the drunkard or that of the emergency aid."[433] Here, while we might find some social action, it does not enter a constructionist loop. We realize, for instance, it is pointless to search for agreement with the drunkard or expect they will find consensus in what we do: they will not loop into our expectations and even if we know them well, the *Chance* of our social relationship is non-existent. So we must relate to them as an "objective probability" toward which anything that we do cannot tame or direct what happens next. In the other case, we also no longer orient toward another person as we lend them emergency aid; our action is oriented instead toward the sudden and overwhelming intervention of something capable of action that can harm or end their life. We do not have to find agreement with one who suffers from this because we cannot, of course, find agreement with the source of their injury: it will certainly not orient towards us or loop into *our* expectations.

Weber reveals a probabilistic criterion for the causal explanation of social action in these different examples, but at the same time he makes a more subtle and distinctly probabilistic intervention. Typically understood, "chance" and contingency are token cases of meaningless chaos, and so anything that suggests a degree of uncertainty as a *regular* feature of action-environments will be received in the way that Geertz defined as "bafflement, suffering and intractable ethical paradoxes."[434] But this makes for a strong conflation: that meaning can only be equivalent to "certainty," or as an answer to a question (e.g., "Why am I suffering?" "Why do good things happen to bad people?" "What is the state?" "Why do I hate my job?"). As we suggested above, in many definitions of interpretation this conflation applies to the extent that meaning-making centers on "typification." For implied chaos *not* to apply, however, for meaningful action not to be tantamount to action under conditions of purported (typified) "certainty," then we must relocate the source of meaning in what is thought to be meaningless by definition.[435]

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[432] Weber, "Some Categories," 171-72.

[433] Ibid, 170.

If we live amid *Chance* instead of chaos, what we confront is neither totally uncertain, nor totally certain. Just like our attempt to guess the result of a game of chance leaves us surprised, it is in that relation of *a parte objecti* and *a parte subjecti* that we can find meaning, whether as an interpretation of the world, seeking certainty, or as a perception of the environment. In the 1913 *Logos* essay, Weber mentions how "sociology typically assumes that objectively existing average probabilities are, on the average, subjectively taken into account … [T]he empirical 'validity' of an order shall for us too consist in the objective confirmation of those average expectations (the category of 'objective possibility')."[436] This will be formulated more extensively in *Economy & Society* as *Chance,* as the inclusive concept that puts all of these together: objectively existing probabilities that are subjectively oriented in meaning, specifically as a judgment of objective possibility. Meaning arises from looping in, in other words, but it does not always find meaning-makers unilaterally constructing what they make meaningful as much as trying to orient or align themselves with it, as an independent source of possibility that, perhaps as a fully apparent "object," *tests* them. This could mean attempting to adapt to what, for all we know, is inevitable (like solar storms in the example used earlier); it could mean finding an orientation to a partner in a social relationship. As *a parte objecti* tries or tests *a parte subjecti*, it is a source of surprise, uncertainty, and ambivalence: the task of meaning-making is either to reduce the appearance of the object-side or to *increase* it, which often works in critique. If there was no separation, as the idealists understood, there would be no occasion for meaning or cognition. In no case, however, is meaning-making independent of a capacity to predict, which only works if there is something "out there" *to* predict.

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[434] Geertz, *Interpretation of Cultures*, 100.

[435] A similar pivot is made by Ann Swidler in the "toolkit" approach, insofar as meaning becomes at least partially tied to institutional environments and our capacity to relate to them by way of action. Thus, "love" becomes meaningful for those oriented toward the prospect of marriage and what it means as an institutional fact. As examined below, probabilism pivots from this approach to the extent that action becomes strongly tied to problem-solving. See Ann Swidler, *Talk of Love: How Culture Matters* (Berkeley: University of California Press, 2001), chap. 4.

[436] Weber, "Some Categories," 161.

Weber uses the example of card players coming to realize that they do not need to follow the rules, that rules are an object to them now, and that they can be subject to an entirely different orientation to *Chance*: this could mean that they bring the rules into dispute—asking "why do we follow these rules? who made them?"—it could mean that they now strategize about how to cheat, predicting how other players will act based on their orientation to those rules, and what is now possible by acting while still oriented to the rules but not "following" them. Thus, the "association" of playing a game of cards "exists so long and insofar as an action, oriented toward the rules in accordance with their average intended meaning, still occurs within a practically *relevant* range." That range includes both cheating and drawing the rules of the game into question.

What might appear "logically [to be an] exclusive alternative—continuance or discontinuance of an association—is in reality an unbroken scale of transitions … this is a fluid situation."[437] It would not be fluid, however, if meaning did not involve a subjective orientation to probabilities, or *Chance*, as neither entirely certain nor entirely uncertain, requiring a judgment to have (if only momentarily) a kind of actuality. For a practice, in Weber's view, the construction of probabilities and the construction of subjective orientation goes almost entirely unrecognized (or is forgotten).

> An actually existing *Chance* of regularity in the orientation of social action will be called a practice if and to the extent that the *Chance* of its existing among a group of people depends solely on its actual performance. A practice that has become familiar through lengthy exercise shall be called a custom. A custom is regarded as having been 'determined by interests' if and to the extent that the *Chance* of its empirical existence is determined solely by the purposively rational orientation of individual action to similar expectations.[438]

What Weber describes here is an almost pure case, as the only meaning a practice has *is* the judgment of its objective possibility, or the sheer incomprehension of any *other* possibility. This dissects a practice as averagely existing probabilities and a subjective orientation are nearly inextricable: practice appears to have no "meaning." Specifically, its meaning appears to play no role in its objective probability. It cannot be given a justification, for instance, and even if its objective probability was, at least originally, based on its alignment with rationality or means-ends efficiency, it no longer needs a justification by such a criterion. As we will see, Weber is particularly intrigued by these kinds of transitions, of practices the objective probability of which *was* constructed as a meaningful formation, but which are now reduced to pure judgment, or practices which are subject to meaning in certain social locations but are practices elsewhere.

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[437] Weber, ibid.

[438] Weber, *Economy and Society: A New Translation*, 106.

Thus, even here, at the far edge of "meaningful action," *Chance* remains the centerpiece of the analysis. Such an account lends the concept of practice a dynamic quality as it dissects "practices" as often entitized and substantial into a core component (e.g. the loop) such that what we observe as practice seems to have no *Chance* of not occurring, though this is only as a result of "actual performance"—a durable and repetitive looping of *Chance* and expectation—and does not issue from a subjective meaning. More generally, this involves the larger question of who (or what) is an adequate cause of what we do.

Varieties of Adequate Causation

If we can adequately cause very little, this is because, as we quickly learn, what specifies *Chance is* opaque and object-like relative to us; it does not seem to matter what we do or expect relative to what *does* happen and what *could* happen. Social action *qua* practice counts in this scenario, at least in the absence of extricating *subjecti* and *objecti* from each other. In other scenarios, we cannot be sure of means-ends connections; the consequences of what we do almost always seem unintended. In this case, we realize that action is happening, only we are not doing it. This, in turn, reduces the responsibility we can have in this situation. But in opposite cases where, say, we make up a game—its rules, what it practically involves, what it means to win—that has never existed before, the opposite applies: we are an adequate cause of seemingly everything that happens, and our responsibility is (perhaps uncomfortably) high. The arbitrariness is blunted only slightly when we delegate "games-making" to an official authority of some kind.

The difference here is essentially a difference in how to orient toward two very different *objecti* *parte*. Weber's preferred word for this (e.g., meaning as orientation) is *Chance*, which encapsulates the dual aspect of probabilistic order: what is possible, what is capable of action, what can be an adequate cause, all as references to the equivalent of "ontological action-spaces." This also conveys a relentless action focus: we only learn *Chance* through action, and while (in principle) we can statistically measure its actual dimension, it only *exists* in action, even in circumstances where we learn that we cannot act. A social relationship with a cashier is such an order, for instance, bound by specifically defined interests and rules, a range of possibility and adequate causes. We can bargain with a cashier about a price, for instance, and it *migh*t work, though we might soon learn how far this is outside the order of expectation. A subtle difference (which artificial intelligence could not register) persists here between a cashier and a salesperson, as different instances of probabilistic order. Such an order may be as diffuse as a space of consensus about the existence of a state, far off in a capital city, for which similar hypotheses about what is and is not possible are "assumed to be empirically valid," at least until we try them for ourselves and, perhaps, surprise ourselves with what we are capable of doing but "never thought possible."[439] It is the presumption of rule, and the presumptuousness of acting as if there were *no* rule, that secures this kind of domination.

There is a key distinction at play here as well, that can easily go unrecognized. In one of Weber's more well-known examples, he discusses an accident involving two bike riders as *not* an example of social action. Yet, if we are riding a bike and are oriented toward bike riders, car drivers, and foot walkers as we peddle down the street, this is social action. The difference revolves around an orientation to *Chance*. Because we are oriented, there can be an accident as what is causally adequate but certainly not meaningful. And this is Weber's larger point: the difference here is not simply one of our perspectives; it is a difference in what the social construction of the world gives us the capacity to expect; our expectations are *not* independent of the world.

Importantly, despite the evident neo-Kantian tenor of Weber's distinctions, these are not questions of epistemology but distinctions involving existing probabilistic orders. An action becomes social action when it finds an adequate cause through the orientation to specifiable *Chance*. When one acts in a conflict only on the expectation that their action can be consensual, this counts as social action and is therefore socially constructive. More specifically, conflict becomes "competition" when "'rules of the game' [determine] the forms of conflict, thereby certainly shifting the conflict probabilities."[440] A fistfight between total strangers can easily turn into a chaotic twirl of fists and rage; nothing specifies *Chance* here. It might not even be clear when the fight ends or what the consequences are. A boxing match, by comparison, is defined through and through by the orientation of the boxers to "boxing" as a specifiable *Chance*; some things can be expected, and only certain actions are adequate in both a meaningful and causal sense. Still, the unexpected can happen.

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[439] Weber, "Some Categories," 170.

By comparison, regulated competitions (for Weber, "the Olympic Games, elections") can be constructive of social order; they can have durations in ways that other types of conflict or selection cannot. Not just anything can be meaningfully and causally adequate to resolve the uncertainty of an election (as even a purportedly "rigged" election will show), and only certain consequences should result from the outcome. When conflict becomes an "organizational action," expectations become routine, bureaucratic. A central authority originates rules about the conflict, dispossessing others of the possibility of making them up on the fly. In certain cases, that authority can even claim to be the only legitimate user of violence. This can tell us much about how the conflict will go, though, still, we can never be *entirely* sure of its course: the organization only tames and specifies *Chance,* it does not entirely eliminate it. Only because so much is already expected can the unexpected happen.

Toward a Probabilistic Explanation in Sociology

The main difference between the different types of social action, from Weber's probabilism, is *how* and *whether* subjective orientation contributes to a recurrent pattern. How is such an orientation made present in social action? For organizational action, rules limit the range of possibility and enforce an orientation via sanction. What we judge objectively possible reflects the presence of rules and their seemingly inevitable sanction. For a game of chance like roulette, a rule-making authority claiming a legitimate rule-making monopoly is noticeably absent. Thus, playing this game excludes the possibility of changing its rules; presumably the threat of ending the game could be sanctioned enough not to break its rules, but this is not generally what players of roulette are oriented to.

In each of these cases, different factors construct specifiable *Chance*, giving rise to objective probability against what will otherwise remain entirely *non*-specifiable to us. "Objective possibility" and "objective probability" are technical terms in Weber's probabilistic theory rather than empirical objects. Both consist of indirect observations of a fundamentally unknowable "existence of specifiable *Chance*," which, as we will now explain, as part of socially constructive loops that, regardless of what sociologists might specifically be observing in the social world, must be part of the story, or so at least Weber wants to claim.

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[440] Weber, "Some Categories," 173.

Thus far, we have argued that the only plausible way to account for Weber's "relentless use of *Chance*" in *E&S* is to pivot away from the received interpretations of his sociology. What we find in these examples are demonstrations of sociological analysis unfamiliar to all conventional definitions of Weberian sociology. Outside of specialists in the intricacies of Weberiana, these insights might not seem to matter that much. On the contrary, as we will argue in the next chapter, there are many "presentist" concerns at stake here, with direct bearing on contemporary sociological theory and research.

Chapter 6 - Elementary Forms of Probabilistic Reasoning in Weber's Sociology

> *The empirical "validity" of an order … is the probability (*Chance*) of its being "complied with." That means…associates, on the average, count on the probability (*Chance*) of order-oriented behavior on the part of others, just as they also, on the average, regulate their own action according to the same kind of expectations held by others.*
>
> ~ Max Weber, "Some Categories of Interpretive Sociology"

As we saw in the last chapter, the term "interpretive" must be used with caution in understanding Weber's sociology. This might seem strange to say; after all, a focus on interpretation might be what Weber is most known for, as a way of recommending best practices for sociology. Actions must be meaningful, and we cannot explain them without understanding them (*Verstehen*). Rather than a search for explanatory laws, the sociologists (and the human sciences more generally) engage in the interpretive pursuit of giving charitable explanations for what people do in the world—-"charitable" because people are not assumed to be pawns of forceful inevitabilities but intentional actors responsive to meaning, who give subjective definitions to qualities of their lives at least enough to "make active persistence appealing."[441]

Since the codification of Weberian sociology and Weber's enshrinement in the American sociological field as a "classic," this version of Weber has been subject to few successful challenges, despite what we have documented as anomalies if we hold fast to an interpretivist and cultural version of Weber. This is a version of Weber that takes *The Protestant Ethic and the Spirit of Capitalism* as his key text and essentially serves as a model-system for interpretive sociology, with all the necessary and hallmark features: interpretation, historical and contextual focus, and an emphasis on meanings or reasons as causes of observable action. The analysis on display in that breakthrough text should be repeated if interpretive sociology and interpretive explanation in sociology is to be more generally sustained and kept valid. The Parsons and Schutz reception and mediation of Weber's later work helps account for how this image of Weber became solidified.

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[441] Alan Sica, *Weber, Irrationality and Social Order* (Berkeley: University of California Press, 1988), 78.

Within the paradigms that have arisen, in part, on the influence of these readings of Weber (social constructionism, ethnomethodology, cultural sociology, interpretivism), Weber's interpretive sociology finds its place secured, but this is a Weber who has been retroactively crafted to be so compatible. It is a Weber who, more recently, repeats certain commitments in the effort to make an incipient culture concept a valid point of emphasis in the social sciences and humanities (e.g., "the cultural turn"). But this is where we depart from Weber the interpretivist.

A cultural and interpretivist Weber commits to a relation to the world in which, in a *primary* sense, a meaningful content is projected onto an otherwise "opaque" world of forces, naming it, giving it a point, constructing or "forming" it, and thus enabling the meaningful interpretation of action in spite of inherent chaos.[442] As we have argued, this is a large assumption to make, and as Weber himself recognized, may commit to an explanatory frame more suited to a game of chance than anything else, in which *a parte objecti* is opaque because nothing we can do seems to augment, change, or redirect it in any way. It also appears as a restriction on what can and cannot be meaningful by preempting any other meaning of "meaning" apart from those defined by recourse to a *theory* of meaning. That is where Geertz took Weber, and we have followed him down that path for far too long. Our argument thus far is that Weber's sociology, and interpretation more generally, can be read more accurately as focused on something quite different than what the Geertzian picture portrays.

As a probabilist, Weber did not commit to a metaphysics of meaningless chaos. What we find in Weber's interpretive sociology is, rather, a sustained focus on the "existence of a (specifiable) *Chance*" as a point of orientation for social action. As the site of meaning that raises two questions: How is objective probability generated? How is subjective orientation looped into it? To challenge the inherited view, we find sufficient evidence to reframe Weber's sociology around probability and the concept of *Chance*. We will now sketch Weber's toolkit for probabilism, his way of answering these two questions, which we can retrieve from many of his most famous concepts and proposals. A probabilist analytic toolkit does not depart from interpretation or diminish its appeal for the task of human science. Yet, concentrated on the loop, interpretation here becomes distinguishable from interpretivism's concentration on coherent symbolic structures, cultural systems, and landscapes of meaning.

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[442] Isaac Reed, *Interpretation and Social Knowledge* (Chicago: University of Chicago Press, 2011), 143; Clifford Geertz, *Interpretation of Cultures* (New York: Basic Books, 1973), 46.

Weber Discovers the Probabilistic Loop

As we described in the previous three chapters, Weber would first (to anyone's knowledge) bring Kriesian probabilism to bear as part of an argument that defended the prospects of a historical method, against a claim (by Eduard Meyer) that historians focus on free will and chance occurrences, to preserve the particularity that is the historical past, and also against a legal reasoning. Historians could make *adequately* causal arguments, and in fact they already do because to assign causal significance to events and actions they must make a judgment of objective possibility. What happens next in Weber's development of Kries' ideas shifts from *Chance* as, in this case, a critique of knowledge, to *Chance* as what Kries himself made it in his recovery of probabilistic reasoning as a critique of frequentism: namely, *Chance* as a feature of the world.

But taking this on board creates a certain paradox for Weber as he tries to adopt these principles for the purposes of developing an interpretive sociology. *Chance* as applied in the examples that Kries tends to use revolves around initial conditions that are easily categorized as "natural," and thus while we can have a subjective orientation to them, those orientations are not critical for action in these types of *Spielraum*. Even if we do not expect their probabilities, they will occur nevertheless. The same does not apply to the topics of sociology, in Weber's view, unless we *do* adopt a Spencerian (or Comtean) version of sociology dubiously focused on the law-like evolutions of a collective object that does not depend on subjective orientation and can therefore be, in a strict sense, *meaningless* (at least in Weber's view).[443] Thus, to resolve this paradox, Weber discovers a dualistic, *looping* perspective: whatever factor might seem important for social life does so because of how it impacts the construction of *Chance*, in the creation of objective probability and the creation of subjective orientation.

For example, Weber does not claim (*pace* legal reasoners) that the mere existence of rules is sufficient to generate social order, though we can readily observe rules as explicit attempts to specify

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[443] Stephen Turner and Regis Factor, *Max Weber: The Lawyer as Social Thinker* (London: Routledge, 1994), 179.

Chance. Without taking form as *sanction*, rules will not matter for social action because by themselves they cannot create expectation. More generally, whatever we might statistically measure as probability will not matter for social action unless it assumes some (empirically documentable) form as a subjective orientation, a "judgment of objective possibility," once reserved for historians in Weber's earlier treatment, now taking form as expectation, presumption, even an interest, a guess, or a hope, all of which grasp at the future in alignment with objective probability. Thus, while some factors (rules, agreement, promises, consensus, conceptions of order) typically construct object probability as initial conditions for likely outcomes, other factors (sanctions, writing, shame, memory, even a probability calculation) create orientations in a manner that alienates people from having to *decide* what to expect. The combination, as Weber realizes, marks the appearance of *Chance*, or what is the same thing, *probabilistic order*.

Drawing all of this together, we reach a point of focus that, at least in Weber's standpoint, that would be novel to sociology as probabilistic reason:

> The objectively 'valid' consensus—in the sense of calculable probabilities—is naturally not to be confused with the individual actor's reliance that others will treat his expectations as valid. Similarly, the empirical validity of an agreed-upon order is not to be confused with the subjective expectation of compliance with its subjectively intended meaning. In both cases, however, there is a *reciprocal relationship of intelligibly adequate causation between the average objective validity of the probability* (logically a part of the category of Objective Possibility) *and the currently average subjective expectations.*[444]

Here we encounter Weber's version of the *loop*: specific configurations of objective probability capture subjective orientation, creating a loop between *Chance* and expectation.[5] Weber explicitly describes this as a reciprocal causal loop such that objective probabilities are adequate causes of subjective expectations and vice versa The reciprocal relationship between objectively "average probability," which is statistically measurable, and subjectively average expectation is direct in this case, as an example of learning what is possible without needing explicit, quantified knowledge of probability. Via learning, people "loop into" objective probability, accessing, in the subjective form of expectations, the mechanisms specifying *Chance* as repeatable and recurrent events.[445] Learning rules counts, particularly when rules rigidly establish the *Spielraum* in this case, the range of what is objectively possible. Learning can occur by grasping "rational principles," such as "equality of opportunity," when they effectively order *Chance* as the justification of a certain range of possibilities, usually through organizational action.[446] This can also include trial and error in more consensus-based contexts. Where "agreed-upon order" allows for a wider range of possibility, people learn what can elicit consensus approval as a "convention," which more often takes form in simply *not* meeting with "tangible disapproval."[447]

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[444] Weber, "Some Categories," 168 (emphasis added).

[445] Learning "an average" without frequency counts or real numbers might have seemed implausible to past attempts to make sense of Weber's probabilism though it aligns with learning mechanisms now proposed by proponents

In cases of social action, expectations are no one's sole possession. They arise, instead, from learning that *reduces* purely subjective motivation and meaning. For Weber, probabilistic expectation is the subjective construct that corresponds—via a causal process—to objective constructions of *Chance*:

> Specifically, for us an action is "adequately caused" when, according to the then-current average probable assessment of facts, the action is subjectively oriented in meaning toward those facts. Thereby the objectively calculable probabilities of the possible expectations also function as an adequate cognitive basis for the probable presence of those expectations in actors. That the terminology of the two converges almost unavoidably does not eliminate the logical chasm between them. Only in the first sense, by a judgment of objective possibility, we obviously mean that those objective probabilities (*Chancen*) are suited on the average to serve as meaningful grounds for the subjective expectations of the actors, and therefore, that they actually (in a relevant measure) did so serve.[448]

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of the "predictive turn" in cognitive science. Daniel Williams, "Predictive Processing and the Representation Wars," *Mind and Machine* 28, no. 1 (2018): 141-172.

[446] Weber, "Some Categories," 177.

[447] Max Weber, *Economy and Society: A New Translation,* translated by Keith Tribe (Cambridge: Harvard University Press, 2019/1921-22), 112.

[448] Weber, "Some Categories," 161.

Thus, the looping of objectivity into subjectivity, evident here as a "judgment of objective possibility," serves as the cognitive basis for whatever specific form *Chance* takes. Action can continue forward in time without finding an orientation to the "existence of a (specifiable) *Chance*," though it will (noticeably) not feature probabilistic expectation. Weber suggests social action can sustain constructed orders through a "purely inward orientation" to legitimacy, "purely affectively," as he puts it, or "by belief in its absolute validity as the embodiment of ultimate, obligatory values." This is close to the interpretivist model of action, and it can apply particularly when public conceptions can alter specifications of *Chance*. However, this seldom happens without combining with "expectations linked to specific external consequences … expectations of a quite particular kind."[449]

Loops enlist people via recurrent and reinforcing orientations, which saves the need to maintain a truly "subjective" orientation to meaning. The objective possibility of that orientation, by contrast, is entirely inward, toward conceptions given their probability independently of orders of expectation, which results in action with a distinctive "other-worldliness." Yet, the construction of collective order, of generalities of broad reach and duration, only when this "purely subjective expectation of compliance with … subjectively intended meaning" is replaced by *probabilistic* expectation.[450] Constructed social orders do not require actors to constantly expend "effort" in maintaining their orientations.[451] Individuals do not need to be the sources of their own expectations when the myriad ways of configuring *Chance* (rules, conceptions of order, consensus) objectify those expectations as part of a loop: "that an action is subjectively oriented in meaning to an established order can thereby initially mean that the actual action … objectively corresponds to the action they had subjectively intended."[452]

Probabilistic Rationalization

The *Chance*/Expectation loop is central to the toolkit of Weber's interpretive sociology and probabilistic sociology as a revised interpretive sociology. As we will establish further below, this particular looping effect, which is common, is also of form *continuity*, as suggested by the marriage of qualitative and quantitative, subjective and objective. All probabilistic reasoning shares this aspect. On these grounds, a revised interpretive sociology can proceed further, in this case toward the decidedly most "macro" aspects of Weber's sociology.

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[449] Weber, *Economy and Society: A New Translation*, 112.

[450] Weber, "Some Categories," 168.

[451] The role of "effort" in action is a central postulate in Parsons's normativist functionalism. Here, a probabilistic reading of Weber shows that it is unnecessary. See also Daniel Silver, "The Moodiness of Action," *Sociological Theory* 29, no. 3 (2011): 199-222.

[452] Weber, "Some Categories," 160.

According to Weber, the construction of general concepts by sociologists implies that people possess "an average measure of the capacities required to evaluate [the] probabilities, thus helping construct the collective order that the concept describes."[453] The core assumption is that "objectively existing average probabilities are…subjectively taken into account by… actors." Objective probability is in no sense uniform; there is no implication that social action must be oriented in the same way, even if the expectations are shared. The *Chance/*expectation loop suggests many sources of variation in this regard. If, for example, a collective order implies a subjective and objective coincidence in a loop, then a possible orientation toward this order is that of the lawbreaker ("the cheat") who "orients his behavior to the very rules whose meaning he subjectively consciously violates."[454] Whether an actor is oriented to a certain specification of *Chance* and, if so, *how* they are oriented, results in particular modes of social action. Yet, a key source of variation here is how broad the "area of expectations … toward which [an] actor believes he can rationally orient his actions."

In large-scale constructed orders, a plurality of social actions—in terms of their modality and substantive contents—can coincide with the same range of possibility. Moreover, the very empirical existence and continuation of a given social order depends on the specifiable *Chance* that people's actions are subjectively oriented to the "rules" so defining it (in the case of associations). This is not a matter of "either/or" (as the probability of orientation can vary continuously), in Weber's view, but a continuum of more or less: "The association exists so long and insofar as an action, oriented toward the rules in accordance with their average intended meaning, still occurs within a practically *relevant* range."[455]

Arguably the clearest discussion of these points comes in Weber's formal theory of rationalization, as presented in the final pages of the 1913 *Logos* essay.[456] In this account, knowledge and explicit understanding can both maintain and change *Chance* through conceptions of order and the making of rules. Though, as Weber points out, this presupposes a social differentiation of those who make rules and establish the "rational foundation of the rules" from those "practically affected by rational techniques and rules" but who do not know or cannot alter those foundations. Rationalization "does not produce a universal knowledge of … conditions and relationships, but rather usually brings about precisely the opposite."[457]

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[453] Ibid, 161.

[454] Ibid, 161.

[455] Ibid, 161.

[456] Ibid, 177ff.

Phenomenological social constructionism, in the tradition of Berger and Luckmann, theorizes the difference between experience-near "intimate" interactions characterizing local orders and the experience-distant interactions of large-scale orders by appealing to the specificity versus abstractness of typifications.[458] Weber's probabilistic constructionism, in contrast, points to the relative range of orientations as the more theoretically relevant feature. When construction occurs as rationalization, a range of different typical orientations applies to "organizational action at least partially regulated through rational rules."[459] Yet in different ways Weber emphasizes how, for most, rules find no rational foundation and are not "agreed upon," but are "imposed from above. Groups of people who are, on whatever grounds, capable of influencing action according to their will, impose statues on this social action on the grounds of 'consensus expectations.'" This suggests movement within a range of possibility in the shift from statute to consensus. Different typical orientations vary socially, temporally, and spatially, and this variation becomes particularly evident in the actor typology we can retrieve from Weber's account.

Rule creators are distinctive for their orientation toward specifications of *Chance* existing principally as a "conception of order." Their orientation is therefore "inward" (e.g., affective, ethical, or religious) or we might say only valid for expectations within the socially differentiated space of others also oriented by conceptions.[460] Such orientations, then, are typical for the center, origin, or inside a rationalizing space, such that "rational rules of an association are…imposed or 'suggested'…for specific purposes."[461]

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[457] Ibid, 178.

[458] Peter Berger and Thomas Luckmann, *The Social Construction of Reality* (New York: Anchor, 1966), 23-24.

[459] Weber, "Some Categories," 175.

[460] Weber, *Economy and Society: A New Translation*, 111f.

[461] Weber, "Some Categories," 178.

Carriers consist of those proximate to the rationalizing space, the center, or origin, but who are oriented to the same specification of *Chance* as a rule rather than as a conception. "The rules are—though not necessarily with awareness of those purposes of their creation—more or less evenhandedly subjectively interpreted and actively carried out."[462] Those with a carrier orientation often find themselves in spaces already configured, thus creating a potential for social change in the introduction of new *Chance*. They do so by bearing the threat of sanctions (either official or unofficial) of a "coercive apparatus."

Those with a *follower* orientation are also oriented by the center, origin, or rationalizing space. This orientation manifests in social action of a more strategic kind in seeking to realize self- or subjectively defined interests. For those with this orientation, they "subjectively [know] the usual application of the rules … as far as is absolutely necessary for their private purposes."[463] The coincidence of maintaining specifications of *Chance* once envisioned only using conceptions now coincides with, and is durably repeated and reinforced by, a larger array of social action when it can be strategically used in the pursuit of varied interests and combined with other orientations.

Finally, "*the mass"* displays orientations most typical at furthest distance from the center, found more often in peripheries, far from the rationalizing space, and, temporally speaking, distant from the origins. What Weber says about this typical orientation indicates a decline in conception and its replacement by consensus at the edge of possible orientation.

> [A]n action approximately conforming to the average understood meaning is 'traditionally' practiced and usually observed without any knowledge of the purpose and meaning or even the existence of the rules. Thus, the empirical validity *particularly* of a rational order rests on the consensus of actors to conform to the habitual, the familiar, the taught and the oft-recurring.[464]

Significantly, we can notice a transition in rationalization by moving away from the original source of rules. Conceptions of order can loop into novel specifications of *Chance* at the site of rule-creation, but this is less effective away from and beyond the rationalizing space. On the edges, at a distance, in peripheral spaces, consensus holds instead. Social action reveals a specification of *Chance* not because it has an explicit meaning, but simply because it is typical or merely probable ("what people do").

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[462] Ibid, 178.

[463] Ibid, 178.

[464] Ibid, 178.

Objective probability can be durable simply because of the absence of reprimand of certain social action, even if a rule does apply that ultimately draws on a conception of order.

In this discussion, Weber offers a particularly vivid example of *moving between* orientations—from conception to sanction to custom—in the context of learning. Though a probabilistic expectation may never take form as a clear conception, it remains a subjective orientation to the same specifiable *Chance*:

> The multiplication table is imposed on us as children exactly as a rational directive of a despot is imposed on a subject. And indeed it is imposed in the most intrinsic sense, as something at first wholly incomprehensible to us in its foundation and even its purposes, but something nevertheless bindingly valid. The "consensus" is initially therefore, plain submission to the customary because it is customary. This remains more or less the case. One learns not through rational deliberations but rather through applied (imposed) empirical cross-checks whether one has calculated in what consensus terms the "correct" way.[465]

Thus, in learning multiplication people learn "consensus expectations" for this particular use of rational numbers. For most, what is possible about these numbers are the rules and sanctions that dictate their proper use. They do not learn the "rational foundations" that make these possibilities objective and specify the *Chance* of using them. Subjective orientation tends toward custom rather than conceptions of order as we move away from the ("other-worldly") socially differentiated spaces in which conceptions alone can specify *Chance*. If multiplication practice remained merely a conception of (mathematical) order and did not transform into sanction (backed by educational institutions), we should not expect that so many would know it (nor expect that they would expect it of us). If multiplication were simply a "consensus expectation" without rational foundation or organizational sanction, then we should expect to find limits in such an orientation. Rules maintained by the educational sanction ensure against this with a more durable looping effect.

The larger point is consistent with probabilistic constructionism. There are different types of orientation via which actors can be captured in a loop to engage in recurrent social action. Ranging closer to or farther from a rationalizing center or historical origin, we tend to find certain orientations: conceptions closer to the center, consensus farther away from it. But while these orientations are quite distinct, in rationalized constructions they are also *linked* together. Weber emphasizes "fluid transitions" between orientations: the same specified *Chance* need not be maintained by the same orientation to be part of social action that is equally constructive.[466]

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[465] Ibid, 177.

The Protestant Ethic as the Construction of a Probabilistic Order

While Weber discusses these points at various junctures in E&S, we can illustrate them further with a reading of his famous *The Protestant Ethic and the Spirit of Capitalism*, which we can read through a probabilistic lens.[467] Here, we can find a continuum or distribution of these different orientations (rule creators, followers, carriers, the mass) in the different figures that appear over the historical period of Weber's argument. The original "creation" by John Calvin and his followers and Martin Luther took the form of "conceptions of legitimate order," as these became possible through an orientation to novel possibilities, in this case within the particular field of post-Reformation theology.[468] Particularly via the "pastoral care" exemplified by those like Richard Baxter, these conceptions of order thereafter became "ascetic Protestantism" with a sanctioning capacity as rules to follow, which made the *Chance* of orientation assume the more predictable form of an orientation to law. The "organization of life" by the Puritans reveals such an orientation at work, but a transition takes place (over the course of around 100 years and after a transatlantic voyage) to a figure like Benjamin Franklin.

As Weber puts it, "all virtues, according to Franklin, become virtues only to the extent that they are useful to the individual."[469] This exemplifies the orientation of a follower rather than a carrier. More generally, a follower orientation takes form in this case as a "middle-class vocational ethos" in which "the middle-class employer … is now allowed to follow his interest in economic gain, and indeed should do so … [R]eligious asceticism gave to the employer the soothing assurance that the unequal distribution of the world's material goods resulted from the special design of God's providence."[470] In all cases, this indicates an orientation toward what are still objective possibilities initially derived from "the Protestant Ethic" as a conception of legitimate order, but now as convention and only as far as

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[466] Weber, *Economy and Society: A New Translation*, 107ff.

[467] Weber, *Economy and Society: A New Translation*, 386, 443-44; Weber, *Sociology of Religion* (Boston: Beacon Press, 1993/1920), chap. 1.

[468] Weber, *The Protestant Ethic and the Spirit of Capitalism,* translated by Stephen Kalberg (Oxford: Oxford University, 2011/1904-05).

[469] Weber, *Protestant Ethic*, 17.

[470] Ibid, 120.

"absolutely necessary for private purposes."

Already, as Weber argues, "in Franklin…this 'spirit' exists without the religious foundation, which had already died out."[471] Yet, we ("today") still observe the same "asceticism" as in these earlier iterations, suggesting that despite the differences of orientation, they still loop into the same objective probability, even though the initial religious conception is now surpassed by a whole universe of mechanisms as "rational capitalism" that are quite distant from religious asceticism and do not seem to rely on the orientation of "rule-creators" as *Chance* increasingly removed from conceptions of legitimate order as it becomes increasingly machine-like, with an almost fully predictable effect on "market *Chancen*" of expropriating most from the means of production.[472] At this point, then, Weber famously pivots and describes the "steel-hard casing" as what, for our purposes, an orientation strictly as custom looks like that "determines the style of life of those born into it." Social action resembles not the "conduct of a vocation" but "simply…economic coercion."[473]

Throughout his narrative, Weber describes different orientations to objective possibility, thus creating probabilistic expectations, but not ones that are necessarily similar to those for whom the orientation is "inward." Weber suggests that subjective orientations to "belief in legitimate order" are not necessary for the existence of social orders. They can exist because most people make judgments of probability but not because they access a conception of what the order is or, more importantly, *why* it is. This applies to the majority of those involved in a given rationalization, yet even in this case it still matters that the very presence of a "conception of order" (or "rules," "legal norms," "knowledge") somewhere creates "the resulting 'probabilities.'"[474]

Thus, only religious conceptions, Weber implies, formed within a socially differentiated space and also fixing objective probability through new conceptions of order, could break with feudal domination. Richard Lachmann's observation seems telling in this regard: for Weber, only with the "external ideological shock from a Protestant Ethic" could the "chronic inelasticity" of feudal domination ever have been broken.[475] But the typical orientation that appeared could not remain as a

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[471] Ibid, 123.

[472] Weber, *Economy and Society: A New Translation*, 244.

[473] Weber, *Protestant Ethic*, 124.

[474] Weber, "Some Categories," 178.

[475] Richard Lachmann, *From Manor to Market: Structural Change in England, 1536-1640* (Madison: University of Wisconsin Press, 1987), 11.

"conception of order," as it was for Calvin and Luther, for the Protestant Ethic to exercise societal transformation (e.g., move "out of monastic cells into everyday life"). To be an adequate cause on such a large scale, conceptions had to become sanctions by rule makers (e.g., pastors) that removed certain expectations from subjective decisions. "Work in a calling" became the (practical) orientation to the possibility of predestined eternal damnation or salvation, testifying one's saved status to others. The effect was to create a highly motivating "psychological premium" for those who knew little about the "rational foundations" of the possibilities they so desperately feared. Ultimately (in figures like Benjamin Franklin), they lose the association with religion entirely.[476]

Weber emphasizes the "fluid transitions" between these orientations in a temporal, social and territorial sense.[477] The same objective possibility need not be maintained by the same orientation, which might be an orientation to an "inward" subjective meaning or conception of order for some, in a certain social or territorial position, or at one point in time, and a law, convention or custom for others in different temporal, spatial and/or social situations. Depending on these orientations, existing objective possibilities will vary, change their form (e.g., from the "Protestant Ethic" to the "Spirit of Capitalism" to the "steel-hard casing"), and may disappear entirely, as a reflection of how this orientation translates, through probabilistic expectation, as social action. As "societalization" takes its course, we find social relations form on larger and larger scales (from organization to society) on the grounds of shared expectation. Seemingly everyone comes to occupy the same order. We should expect to find this continuum of orientation, particularly as it becomes skewed toward "custom" and away from "subjective meaning."[478]

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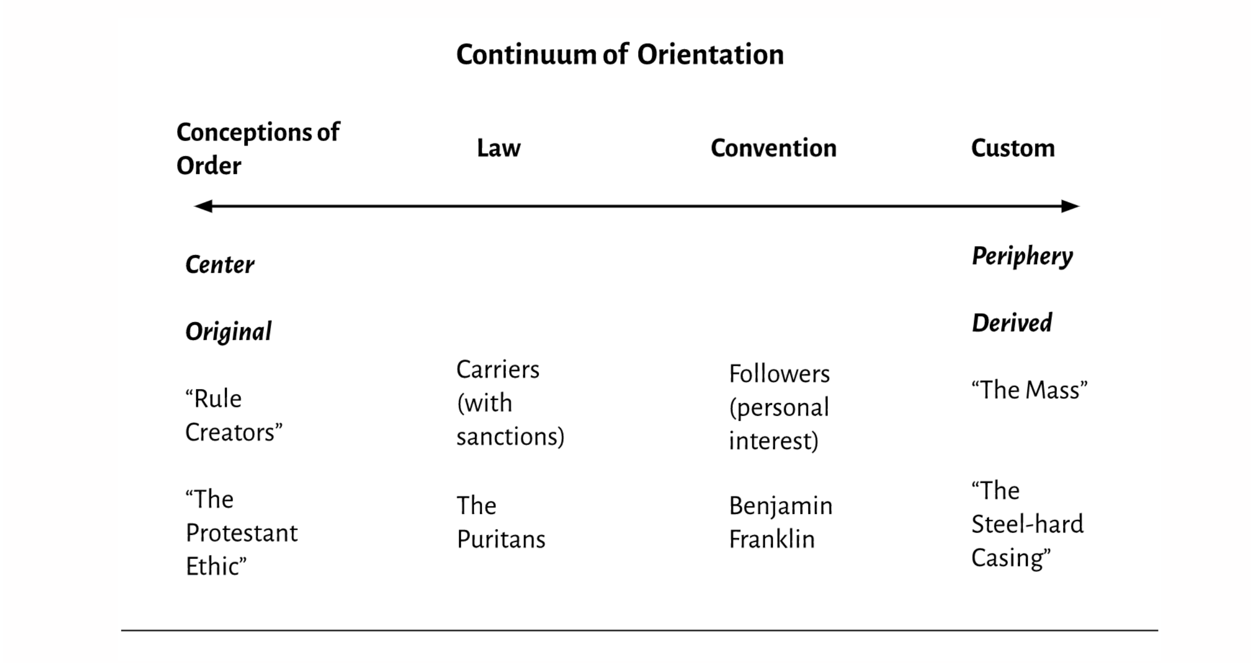
[476] Stephen Kalberg, "The Rationalization of Action in Max Weber's Sociology of Religion," *Sociological Theory* 8, no. 1 (1990): 58-84, quotation is on p. 61.

[477] Weber, *Economy and Society: A New Translation*, 107ff.

[478] Weber, ibid, 101, 109ff, 348ff, 386-87, 455-56.



Continuum of Orientation

Conceptions of Order	**Law**	**Convention**	**Custom**
Center			***Periphery***
Original			***Derived***
"Rule Creators"	Carriers (with sanctions)	Followers (personal interest)	"The Mass"
"The Protestant Ethic"	The Puritans	Benjamin Franklin	"The Steel-hard Casing"

Figure 2: Distance, Range, and Orientation in *The Protestant Ethic*

As a general rule, then, the *wider* the range of orientations, the more objective (taken for granted, simply assumed) a given orientation will seem to be, coinciding with more social action within a spatially larger (and, we might assume, temporally longer) "area of expectations toward which the actor believes he can rationally orient his actions."[479] When the Protestant Ethic was possible only as a conception among Puritan pastors, it was less objective, far more tenuous, and with a much narrower reach. It defied other orders of expectation, as evidenced by ostracization of Puritans, due to their "other-worldliness," manifest to the outside world as a strange asceticism, ruthless religiosity, and extraordinary discipline. When a judgment of objective possibility persists to the "steel-hard casing," it is still salvation at stake, but of a very different kind, one that needs no conceptions and does not require subjective meaning (and which is no longer a "legitimate order" for most).

Even here social constructions remain subject to adequate cause by expectation: if the loops break down, so too will the objective probability of whatever they construct, no matter how much duration it appears to have. But when what is expected is as objective as rational capitalism, the contribution of this orientation fades from view. *Chance* can simply mean what will happen if one does not, say, "show up at work on Monday morning." Nevertheless, depending on these orientations, even such a specified *Chance* as this, Weber implies, is rooted in a once very tenuous process of social change in which the same objective probability first took the form of a novel (and, for most at the time, strange) conception of order. This provides an entry point, then, for what are sure to appear as novel aspects of Weber's argument about (probabilistic) social construction: namely, the distance of rationalizing center to periphery, the range of applicable orientations (and how they change across that range), and the both metaphoric and literal inclusion of space here, with the implication that it is possible to move into (or create) a space where even the objective probabilities of capitalism do not apply.

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[479] Weber, "Some Categories," 160-61.

Distance, Range, and Orientation

As Weber's probabilistic approach to social construction indicates, in spatial terms, something like the state is only as present as its objective *Chance*. We will explore this further below. From this perspective, the threat of physical violence aside, the subjective orientation to the state is not constant but features a variation. And this variation is most accurately captured by Weber's theory of rationalization, which describes, in detail, differences in subjective orientation according to a measure of *distance*.[480] Notably, this a *formal* claim with application to no particular case, though the "model-system" in question is what Weber described as the historical tendency of European rationalization, based on the appearance of autonomous value-spheres from an originally, undifferentiated religious base. Despite the limits of this account, the probabilistic application of demonstrates how *Chance* becomes embedded in social action in which a *loop* creates expectations not relating to *local* objective probability (e.g., "custom" or "habit") but to explicit knowledge or "rules" produced by others at some *distance* from the actor, who retains an orientation to something like a center, even if they have no recognition of this, or more specifically, even if their orientation comes in a different form from what the same orientation looks like *at* the center (or originating point, source of rationalization).[481] The basis of the formal theory, which Weber articulates primarily in the 1913 *Logos* essay, bears a strong resemblance to his account in *The Protestant Ethic,* as we have rehearsed.

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[480] Weber, ibid, 178-19; Weber, *Economy and Society: A New Translation*, 386, 443-444; Weber, "Science as a Vocation," Max Weber, "Science as a Vocation" in *Max Weber: Collected Methodological Writings*, edited by Hans Henrik Bruun and Sam Whimster (London: Routledge, 2012/1919), 350ff.

[481] Weber, *Economy and Society: A New Translation*, 107-08.

In talking about rationalization, Weber specifically tries to capture a series of *level* distinctions (rather than historical stages) in the "cognitive basis" that emerges within the loop from a direct interface with objective probability and indicates a difference in the *Chance* of orientation to rules and knowledge according to a measure of social distance.[482] The "rationalization of social action," via the enactment of explicit rules and statutes "governing" activity as Weber claims, paradoxically "does not produce a universal knowledge of their conditions and relationships, but rather usually brings about precisely the opposite."[483] Explicit knowledge as to the rational bases or intent of the rules diminishes among the vast majority of people subject to them, even as it increases among a few that initially had the power to enact them and impose them on the masses. However, this could not occur unless a different cognitive basis for "subjective meaning" exists independently of explicitly rationalized meaning.

Weber here suggests that rationalization only occurs by essentially creating a chances/expectations loop with the paradoxical effect of making explicit knowledge and meaning ("rules") both *more important* (as potentially explicable) though *less of a concern* for most. As Weber expands on these points in "Science as a vocation" he refers to "rationalization" and "disenchantment" in terms that reflect a shift in orientation. The context is one in which "ultimate and most sublime values have withdrawn from the public sphere," in which "only in the smallest circles of the community, from one human being to another, pianissimo, that a pulse beats as a faint echo of that prophetic spirit which in former times went through the great congregations as a fire storm and welded them together."[484] This refers to the development of explicit knowledge and rules that are less important for their content than for the fact that, for most, they are produced *elsewhere,* in smaller, distal circles, to which most are therefore oriented to only as a received "average understood meaning."

In such a rationalized setting, the *Chance* of social action to be oriented in this manner enhances the *Chance* of social orders to be "rational." In Weber's argument this "generally established belief that the conditions of…everyday life…are *in principle* rational, that is, are human artifacts accessible to rational knowledge, creation and control---a belief that has certain significant consequences for the character of the 'consensus.'"[485] Rational knowledge does not create this consensus, though it can heighten its *Chance* and relative frequency, which will deepen matching expectations in the loop. Nevertheless, social orders can be maintained without most participants ever needing an exact reason "why." This belief is added, then, as a product of "social differentiation and rationalization" of the sort that finds distinct groups relating to a given order in different ways: by rational rules, by the application of rules (whether selectively or generally), or by averagely understood meaning and habitual "consensus."

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[482] Weber, "Some Categories," 176.

[483] Ibid, 178.

[484] Weber, "Science as a Vocation," 352.

This is arguably Weber's most fully articulated treatment of a rationalization process and, as this indicates, it cannot be accounted for without adopting probabilistic reasoning. *Chance* applies, more generally, that a given orientation to the rationalizing space is present. While academic or scientific spaces often serve in the role of "centers," they do not have to. There can be organizational rationalizing spaces, the state can serve in such a role, and religion in its literal "other world" orientation and "process of abstraction" provides a prime example.[486] Whatever serves as the rationalizing space, the transmission of its novel objective probabilities can affect the subjective orientation of those distant from this originating space. Thus, like social relationships and the state, social action here is the focus of a probabilistic explanation; sociologists identify the conditions necessary for more and more people to be captured by a loop. But this also implies that, in a historical sense, there can be more or less *range*; differentiation is a process that generates *more* social action by creating different objective *potentials* for social action. If, in Weber's cryptic account of "value-spheres," he is concerned with the "most rational forms reality *can* assume," this implies the construction of a center and a range, that makes "ethical action" possible beyond the unmediated potentiality of "brotherliness."[487] If this is referred to as "rational," this only means that it features the spatial dynamic of a center, resulting from some form of dispossession, and an objective potential contingent in some way on orientations to "conceptions of order." For most people this takes the form of a test that maintains one distribution as separate from another, for instance "proving oneself" in the world (experiencing a "life-fate") via profit rather than reasons of state.[488]

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[485] Weber, "Some Categories," 179.

[486] Weber, *Economy and Society: A New Translation*, 386, 443-44; Weber, *Sociology of Religion*, chap. 1.

[487] Max Weber, "Religious Rejections of the World and their Directions," in *From Max Weber: Essays in Sociology*, edited and translated by Hans Gerth and C. Wright Mills (New York: Oxford University Press, 1946/1915).

[488] Weber offers the example of a classical Greek distinction in masculinity, in which "the treatment of erotic

Probabilistic Power

For Weber, then, rationalization occurs via probabilistic pathways constructing order by specifying *Chance*. Elsewhere, he uses a similar form of probabilistic reasoning to make distinctions between "communalization" and "sociation" as different ways of constructing social relations.[489] In the first, social relations produce a sense of belonging and cohesion with a reduction of the transparentness of subjective orientation: individuals cannot, alone, be adequate causes of what happens. In the second, we find more subjectivity, with sociation featuring more "consciously chosen" adequate causes. The distinction mirrors one we can find between an "objectively correct" orientation versus an instrumental orientation. Noticeably, these do not have to feature specifically social action. Where a central authority claims rules of "selection," sociation consists of an orientation to the expectations of others via rules in a competitive setting.[490] Selection, Weber contends, that is not socially ordered, will otherwise consist of adequate cause in the form of biology or of one "elemental force" paired off with another: in neither case can our expectations change nor alter what happens.[491]

The implication is that social action requires an adequate cause to be rooted in a judgment, and something must construct *Chance* as a probabilistic order. Arguably the clearest example of this is found in Weber's analysis of power and legitimate order, which might include examples of both sociation and communalization, in addition to conflict and selection, but in all cases the order in question revolves around the construction of *Chance*: subjective orientation that loops into objective possibility, creating expectations of what should or what will probably happen, in both cases judgements that maintain the order. The same is not true, as we have emphasized, outside of

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experience with women as 'life-fate' … would have appeared as almost sophomoric and sentimental." It was only with the "crypto-erotic religiosity" of the Middle Ages that there "began the 'probation' of the man … in the face of the erotic interest of the 'lady.'" See ibid, 345-46. What Weber attempts to track here, in fleshed-out probabilistic terms, are tests that signal the "erotic sphere" as a realm of adequate cause that can thus be referenced as "proof" of worth. As Weber notes (ibid, 349) this aligns with Nietzsche's *Will to Power* in its account of "transvaluation" via engagement with *force*, which (in addition to the influence of Tolstoy's *War and Peace*) generates a strange commonality between Weber's tests and Bruno Latour's polytheistic "trials" in which, whether using words, money, sauces, intimate partners, wounds (etc), "we like to do the same things with them—that is, to learn the meaning of strong and weak, real and unreal, associated or disassociated," to to make potentials into actualities, in other words, and learn "the meaning of the word 'reality.'" See Bruno Latour, *The Pasteurization of France* (Cambridge: Harvard University Press, 1988), 155ff.

[489] Weber, *Economy and Society: A New Translation*, 120f.

[490] Weber, "Some Categories," 173.

[491] Weber, *Economy and Society: A New Translation*, 117f.

probabilistic orders.

According to Weber, "Power can be defined as every *Chance*, within a social relationship, of enforcing one's own will even against resistance, whatever the basis of this *Chance* might be."[492] Two things deserve comment here. First, Weber's definition of power, like his definition of the state, has been incredibly influential across all corners of social and political theory. Second, the fact that this core concept is squarely defined in terms of *Chance* is analytically consequential, although a lot of secondary commentary has not focused on this aspect. As a probabilistic phenomenon, power must be an adequate cause, which in this case means that both conditions in Weber's definition must apply: (1) there is the possibility of resistance in a relationship that involves the enforcement of will, but (2) resistance is not typically pursued. Thus, a probabilistic approach to power, like Weber's, involves mechanisms constructing (and maintaining) probabilities that oppose the *Chance* of its dissolution.

When Weber defines the term "domination" in the 1913 *Logos* essay, he puts particular emphasis on a looping relation giving a central role to expectation, rather than non-social action in which a "stronger elemental force … somehow asserts itself." In domination, "the action of those giving the orders is related in meaning to that of those obeying, and vice versa, in such a way that both *can* ordinarily count on the realization of the expectations toward which they have oriented their action."[493] In domination, the expectations of one party (order givers) typically coincide with the expectations of another (order takers). For Weber, likewise, "[r]uleship is the *Chance* that a command of a particular kind will be obeyed by given persons." Related to this "[d]iscipline is the *Chance* that, because of a practiced disposition, a command will find prompt, automatic, and schematic obedience… ."[494]

In Weber's famous observation, "no rulers will voluntarily rely merely on the material, affectual [sic] or value rational-motives for the *Chancen* of survival. Instead, they will seek to arouse and foster belief in their 'legitimacy.'"[495] A probabilistic translation of this statement goes like this: no ruler can rely on "action" to maintain rule. Rulership must acquire an adequate cause, keyed to the fact that rulership is a type of social relation with those ruled. Because social relationships are probabilistic, consisting primarily of "the *Chance* that behavior corresponding to its meaning will recur," so is the ability to rule.[496] Thus, to rule requires the enrollment of others oriented by expectations, though these expectations need not necessarily loop into a conception of order (e.g., "the divine right of kings," "*liberté, égalité, fraternité*"). In a probabilistic sense, legitimacy refers to sources of rule (often these are conceptions of order) as a specification of *Chance* that opens up the relationship to the possibility of resistance, but which also typically ensure that one party will *not* meet resistance in this relationship. This creates the recurrence and repetition that constructs a ruling order.[497]

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[492] Ibid, 134.

[493] Weber, "Some Categories," 168.

[494] Weber, *Economy and Society: A New Translation*, 134.

[495] Ibid, 339.

Contrary to most readings and applications of Weber's definition, only now, after having defined rulership and power in relation to *Chance,* are we in a position to discuss Weber's definition of the state. The state, according to Weber, is a subtype of ruling organization, which he referred to as *political organizations*. These last are characterized by the fact that "the existence and the validity of its orders can be continually guaranteed within a given geographical area by the application and threat of physical coercion by an administrative staff."[498] Political organizations are thus inherently *territorial* and built on objective probability as, in this case, the authorized use of physical coercion in the exercise of rule over other people within that area. Whatever other adequate causes ("consciously chosen" or not) might apply in a territory, social actions coincide with the existence of the state. More bounded types of rulership lack "territoriality," such as when power moves as the monarch moves through space, making an orientation to it highly variable.[499] States, meanwhile, become adequate causes for social actions at all distances from a territorially defined central authority (e.g., "the capital") and in all temporal periods after a moment of founding or constitution. More specifically, a state is an "institutionally organized political enterprise…[whose] administrative staff can lay claim to a monopoly of legitimate physical force in the execution of its orders."[500]

Thus, the state exists only insofar as there is a specifiable (and therefore non-negligible) *Chance* of its being an adequate cause for all the social action found in a territory. Yet, the sole focus on the state as a specific mechanism for monopolizing violence within a territory is misguided. The state emerges here as a recurrent and punctuated (rather than inevitable and constant) entry in a larger background of non-statist associational/consensual action. The existence of a state (like any other organization) is therefore fully probabilistic, since it "ceases to 'exist' sociologically with the disappearance of the *Chance* that particular forms of meaningfully oriented social action occur. This *Chance* might be very great, or infinitely small…[t]here is no alternative and clearer meaning for the statement that, for instance, a particular 'state' 'exists,' or 'no longer exists'."[501] Put differently, a state, or any probabilistic order, exists as a *distribution* or *range* of possibility, in this case in a territorial sense, as this concerns the *Chance* that *this* political organization (and no other) will be recognized (or not) as the sole bearer of the legitimate right to enforce their rule via the threat of physical violence.

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[496] Ibid, 105.

[497] Ibid, 334ff.

[498] Ibid, 135.

[499] John Ruggie, "Territoriality and Beyond: Problematizing Modernity in International Relations," *International Organization* 47, no. 1 (1993): 139-174, quotation is on p. 151.

[500] Ibid, 146.

Hence, the state, as Weber understands it, defines a continuous probabilistic field of potential actions and interactions distributed within a given territory that depends on action oriented to ruling relationships as objective sources of probabilistic expectations. As *Chance*, power is not constant or deterministic, and neither is it episodic. Whatever factors are the source of power (discursive, material, performative) are the source of this *Chance*, as constructed from a repeat "taming" of the possibility of resistance to the imposition of will only after having engaged that possibility. Without engaging the possibility of resistance, Weber implies, there will be no power, because there will be no *orientation* to it (whether it assumes the form of a state or not).

The Legitimacy of Legitimate Orders

Power, rule, and rationalization: these key concepts for Weber can be redefined in probabilistic terms, specifically as they involve specifications of *Chance* and entail looping effects. Because these are probabilistic, this entails a shift in explanation, not least because we cannot rely only on subjective meaning alone: it must loop into conditions that create objective probabilities, at least outside the novel conditions where there are none or when subjective meanings assume the most common form as principles or conceptions.

Thus, the true test of probabilism's extent in Weber's thought would seem to be its application to arguments that are typically reliant on subjective meaning or these cognate terms, which in our earlier discussion was a tripping point for both Schutz and Parsons in their engagement with Weber. They could not break with an image of thought that posits meaning as a bridge to the opaque world, which for Schutz even included probability. Yet, for Weber, belief can itself be *Chance*, as opposed to a tenuous bridge over chaos. This is despite Parsons' influential appropriation of the argument which left legitimate order arguably the farthest removed from any connection to probability.[502] Specifically, Parsons associates legitimate order with the "*idea* of legitimate order" and, most influentially, with "common value *attitudes*."[503] However, this omits a key mediator that cannot be accounted for other than as probabilistic: *belief* in legitimate order as specifically the *Chance* of belief. For Weber, the "*Chance* of orientation by a belief '*is*' 'the' valid order."[504]

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[501] Weber, *Economy and Society: A New Translation,* 104.

For Weber, "order" requires a particular meaning, as it becomes distinguishable from "regularity in the orientation of social action." As mentioned earlier, that regularity is a critical component of practice, for which the *Chance* is strictly tied to "actual performance." But in the token example that Weber gives of "an official [who] routinely appears in his office at the same time each day," it is "not only the result of a familiar custom, nor only determined by his given interests … This happens as a rule generally because of the imperative 'validity ' of an order … infringement of which would not only bring disadvantage but would normally be abhorrent to his 'sense of duty.'"[505] For the *Chance* of legitimate order, then, there are two preconditions: first, that there be "principles" to which action is "on average and approximately oriented," and second, that an "actual orientation to those principles is also in practice followed because [they] are in some way or another recognized as binding or exemplary for the action." As Weber adds, legitimate orders are "less volatile" than those that only arise "for purely purposively rational motives" or for orders in which "an orientation [is] based solely on custom."[506]

Significantly, then, the probabilistic component of Weber's argument comes through here as a kind of gradation or continuum, not to mention a high degree of fluidity. It is possible, Weber contents, with the range of possibility that is a legitimate order, to break the rules. But if the order is "valid," this will always comes through some medium of concealment; *that* is in an indicator of an orientation by way of exemplary principles. It is also possible to be oriented to different, and inconsistent, legitimate orders at once as "simultaneously valid." What Weber portrays here, then, is a landscape not necessarily of formations of meaning, but of self-contained orders all of which have the specific looping effect of creating a *Chance* of belief based on an exemplary or obligatory principle.

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[502] Talcott Parsons, *The Structure of Social Action* (New York: McGraw-Hill, 1937), 658ff.

[503] Ibid, quotations are on p. 651 and 670 (emphasis added to both).

[504] Ibid, 111.

[505] Weber, *Economy and Society: A New Translation*, 109.

[506] Ibid, 109.

At this point, Weber makes a relevant distinction. Legitimate order is not *legal* order, because accounting for law cannot answer the empirically relevant, causal question that applies to inquiries into whether the adequate causes of legitimate order are those that are active. There simply is no "causal relationship between an empirical event and the normative validity of an order in the strict legal sense," as any consideration of the law can only answer the "question of whether the order properly interpreted in the legal sense 'applies' to the empirical event."[507] What a concentration on legal interpretation primarily forgets is a relentless focus on action. Weber allows for the law to be the "exemplary or obligatory principle" that draws the orientation of people, but the empirical validity of that is a different question than a legal analysis. And this contains a broader point. For the same could be said about what it means to claim that actors are "oriented" by meaning more generally.

The probabilistic approach that Weber develops here finds many different sources of regularity. What is at stake, above all, are the factors that create *Chance,* which, as we will argue below, can be diagnosed as the expectation of something, as what we perceive to be something *missing* when we are oriented by *Chance*, and this can apply equally to the perception that exemplary action mirrored in a principle is missing, as it is that a custom or tradition (what it is typical to do) is missing. The "missing" aspect becomes apparent in perception, and we act to maintain *Chance* by correcting these errors.

We will examine that process in detail a little later. What it implies, however, are the various factors that construct *Chance* in the first place, which in the case of legitimate order includes the devising of principles and a means for creating an orientation to them. A probabilistic reading of Weber's *Protestant Ethic* does not find an argument for the universal role of "ideas in action" as much as it finds an account of the construction of the *Chance* of orientation to a new legitimate order, and then the shift of that legitimate order into what, in its "averagely understood meaning," now resembles more of a practice as an order maintained by a judgment that any alternative is minimized or objectively impossible—a blending of *a parte objecti* and *a parte subjecti* almost entirely in a loop of orientations, in which potentials are made actual without notice and only with some exteriority (like calculated probabilities) do they become apparent. In this case, free activity creates its objective conditions, which are not simply given, but are presuppositions of the activity. Interpretation, as envisioned by those in a theological field, can be a condition for free action, as interpretation can then be its presuppositions (because nothing else is). That, in a probabilistic sense, is the "contingency of interpretation."

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[507] Ibid, 111.

Ideal Types as Typical Expectations

This link between *Chance* and the ideal type is suggested in Weber's early use of Kries as part of his effort to apply the idea of adequate causation for empirical rather than legal purposes. Ideal types become a modulation of *Chance* as descriptions of typical expectations that can, in turn, be used to establish adequacy as a probabilistic form of explanation. For Alfred Schutz, however, ideal types were the "typifications" made by actors in structuring their experience of the world with what he theorized as a high "chance" of mutual understanding.[508] This rendering of the Weberian concept has proven integral to incorporating phenomenology into sociology in the form of social construction. Yet what it does not allow (though, it seems, Weber could) is an ideal-type referencing the "average" or "expected" without needing to find a person as an interpreter. The same would apply to more recent approaches to the explanatory status of the "ideal type" that emphasize its purely heuristic use.[509] Here, the ideal type becomes a tool of analysis capable of locating the (idiographic) particularity of a given phenomenon or event.

This approach also depends on an imputation of expectation, this time by the analyst. However, the heuristic perspective's dependence on such an imputation leads to sidestepping an essential thing that Schutz and the social constructionists noticed: people carry (typical) expectations, which matter for subjective meaning. Yet, for both the phenomenological and the heuristic arguments, what is precluded is an ideal type referring to particular moldings of *Chance,* to *Spielraum* and probabilistic orders, and more generally to associations between ideal-types and judgments of objective possibility. The ideal type is not a measure of frequency—as both phenomenology and methodological pragmatists argue—but this also means that it is not the possession of an actor or an analyst's heuristic invention. In the probabilistic rendering, ideal types are neither subjectivist nor objectivist; they instead reference probabilities that have been *made* objective.[510]

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[508] Alfred Schutz, "Common-Sense and Scientific Interpretations of Human Action," *Philosophy and Phenomenological Research* 14, no. 1 (1953): 1-38.

[509] Richard Swedberg, "How to Use Max Weber's Ideal Type in Sociological Analysis," *Journal of Classical Sociology* 18, no. 3 (2019): 181-196.

When Weber tells the story of a "temperamental young mother who is annoyed by some kind of unruly behavior on the part of her young child" and loses her temper, he is trying to do something specific: he is trying to show that adequate causation is not only an analyst's sole analytic tool.[511] As Weber suggests, "like Moliere's Philistine who is pleasantly surprised to learn that he has been speaking 'prose' all his life," the mother in such a scenario soon realizes that her explanation had "utilized the category of 'adequate causation'" all along. Specifically, the mother tries to diminish her responsibility by appealing to the child's "empirical knowledge" and how the child would have learned, by now, that "under the vast majority of all *possible* constellations [of factors]," the mother losing her temper stands out as a "'fortuitous' reaction" instead of an "adequate cause."[512] This particular *Spielraum* and its order of expectation shared by mother and child alike could be different in a different scenario with another mother. Different judgments of objective possibility could be made. Yet, here only *certain* judgements can be made with adequacy.

This example is found in the middle of a primarily technical discussion, but it is with good reason that Weber uses it. Adequacy is the product of "[isolating] by abstraction some of the 'conditions' present in the 'material' [furnished by] events and makes them the object of 'judgments of possibility,' to gain, with the help of rules of experience, an insight into the causal 'importance' of the individual components of events."[513] Nevertheless, Weber is not claiming that this is an epistemic practice exclusive to researchers.[514] Instead, he implies a direct analogy between adequate cause as defined by a "historian" and adequate cause as an explanation given by a layperson in a given scenario. In both instances, the explanation is probabilistic because it leverages *typical (non-subjective) expectations* that, this suggests, have been *learned* rather than subjectively formed, implying in the case of child and mother some direct relation between their ideal-type comparison point and an objective aspect of the world.

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[510] Weber, *Economy and Society: A New Translation*, 88.

[511] Weber, "Critical Studies in the Logic of the Cultural Sciences," 178-179.

[512] Ibid, 178.

[513] Ibid, 182.

[514] Fritz Ringer, *Max Weber: An Intellectual Biography* (Chicago: University of Chicago Press, 2002), 80ff.

Coda: Weber the Probabilist

We can no longer read the sociology of Max Weber as being interpretive"in the typical meaning of the term. The reading we advance here pivots from this convention by making it clear that when Weber embraced sociology, particularly in work over the last decade of his life, he increasingly associated sociology with the unique study of *Chance,* linked to a theory of action that emphasizes the role of probabilistic expectation *in* action, as informed by Weber's development of ideas he had drawn from the probabilistic thinker Kries. For Weber, a looping relation between subjective expectation and objective probability becomes an integral part of all collective orders, which allows him to avoid the kind of collective object problem he observed in sociology at the time. Looping effects blur distinctions between subjective and objective, making it less clear that action must be subjective, and that "collective entities" must be objective. For Weber the probabilist, the *Chance* of subjective meaning meets several hurdles, which makes it not impossible but exceptional. Judgments of probability, or orientations to *Chance* are consequential for social action not as reference to subjective meaning but rather to probabilistic expectation, which can be broadly shared. In these ways, Weber draws time and motion into sociological reasoning, but he also draws them together with social construction, which is unusual. Probabilistic constructions can appear from initial visions of possibility found within narrow circles, in socially differentiated spaces where those possibilities remain purely conceptual, only to become social orders later on that we can refer to using a collectivist language, as general entities of long duration with apparent cycles and laws, built on shared orientations captured within ever-recurrent loops. Weber's *Protestant Ethic* contains lessons of this kind when we pair its narrative with proposals that Weber makes by envisioning sociology and social knowledge on probabilistic terms.

Yet, our revisionism should not be understood in an entirely relative manner, as proposing another Weber, because it concerns a difference both formal and in kind. Weber the probabilist calls forth not a kind of stabilizing recognition but the potential of a completely different model, an essentially unrecognized *terra incognita*. In a sense, a difference such as this can only begin from what has been established as common sense, by making a distinction with a conceptual armamentarium of established value, even to the point of being unquestionable. As with any proposition, we can distinguish between expression and designation.[515] Weber's probabilism expresses a host of ideas that seem to lack objects to designate, because it breaks with recognition and representation within the sociological field, as these are understood in the protective mode of theorizing mentioned above, with the goal of maintaining the identity of concepts and resemblance with regard to objects. Yet, probabilistically understood, concepts only ever give rise to possibilities. They are judgments of possibilities; they do not create claws of necessity. What we have attempted to do is give reasons to think about Weber again.

Though, we do not wish to get lost in the depths of Weberiana by claiming Weber as a probabilist; but neither, for that matter, do we have to. A certain reading of Weber resides at the heart of what is typically understood as culture, as a resource rather than a topic, with implications for the recognition and representation of the term. By contrast, Weber the probabilist moves toward distinguishing what now appears as a post-cultural analysis by finding a potential in sociological reasoning and especially concept-formation beyond a common project of recognizing that culture or action as needing to have the same traits *a priori*, as opposed to effectively embracing all their *possible* traits. Probabilism proposes a divergent project, guided by new conceptions of what order is (objective probability, *Chance*, loops) and a different way of making judgments and providing explanation of orders with generality and duration. But we do not have to stop with Weber. A line of influence arises with Weber's probabilistic approach, based on a different and still under-the-radar encounter. If Parsons and Schutz pivoted from probabilism, and if contemporary sociology has followed them, Pierre Bourdieu did not.

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[515] Gilles Deleuze, *Difference and Repetition* (New York: Columbia University Press, 1994/1968), 153

Chapter 7 - Falling Backwards into Sociology: Bourdieu and Probabilism

> *There is no repair for a lost present, above all, when the disproportion between satisfactions and sacrifices eventually crops up and dispossesses from its meaning a past entirely defined through its tension towards the future.*
>
> ~ Pierre Bourdieu, "The Future of Class and the Causality of the Probable"

Despite the reams of commentary on the late French sociologist Pierre Bourdieu that have accumulated in English-speaking sociology over the last four decades, the particular emphasis Bourdieu gives to what he calls, following Weber, "objective probability" has nearly gone unnoticed. This is notwithstanding the fact that Bourdieu almost verbatim repeats various formulations and reformulations of the idea in publications, lectures, and addresses spanning from as early as 1963, to his initial practice theory of the early 1970s, to his key theoretical statement *The Logic of Practice* in 1980, and to *Pascalian Meditations* published in 1997, his last theoretical statement, very appropriately titled as a direct homage to Blaise Pascal.

The connection to Weber's probabilism is fitting and significant but has also not been remarked upon despite several analyses showing the Weberian roots of many of Bourdieu's central concepts.[516] Oddly, as we will see, understanding Weber's approach here serves as a "skeleton key" to understanding the French sociologist's own seemingly obscure, ignored, misunderstood but surprisingly extensive, brand of probabilism. Bourdieu had the benefit of reading Weber with fresh eyes, free of Parsonian (or Schutzian) baggage, given his uncertain positioning in sociology and the fact that French sociology was not configured around a canon in the same manner that American sociology had come to be following Parsons.[517]

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[516] Rogers Brubaker, "Rethinking Classical Theory: The Sociological Vision of Pierre Bourdieu," *Theory and Society* 14, no. 6 (1985): 745-775. David Swartz, *Culture and Power: The Sociology of Pierre Bourdieu* (Chicago: University of Chicago Press, 1997).

[517] Bourdieu was evidently influenced by a 1965 French equivalent to Edward Shils and Henry Finch's *Methodology of the Social Sciences* (Chicago: University of Chicago Press, 1949) which formed the basis for debating Weber's

These details are not minor, we argue because they mean that the Weber who appears at heart of Bourdieu's influential approach to sociology is a very different Weber than the (interpretivist, institutionalist, historicist) one who has been passed down to American sociologists and persists in mostly unchanged hybrid form to the present day. Bourdieu's Weber, by contrast, is *Weber the probabilist* for whom, as we have argued, probability is not a purely instrumental statistical measure, neither is it a reified positivist trope; rather, it constitutes an integral component of *action*, though importantly not as a token of subjective meaning.

As we will see, the loop that we can retrieve from Weber's thought finds its way directly into Bourdieu's "general sociology" and, as becomes evident through the centrality of objective probability in Bourdieu's early lectures at the *College de France*, demands a significantly revised understanding of the core concepts of Bourdieu's approach to sociology. Just as with Weber, Bourdieu endeavored to define *all* the core concepts of sociology in terms of probability. This point has been missed or deeply understated in previous commentary, which in rehearsing the tired and formulaic triad of habitus + field + capital, fails to grasp the fundamental conceptual unity behind all the notions Bourdieu mobilizes.[518]

We will now tell the story of Bourdieu's encounter with and adoption of probabilism, which hinges as far as we can gather on Bourdieu's reading of Weber's 1913 *Logos* essay sometime in the early 1970s, after which Bourdieu's thinking shows a distinct change and new themes appear that remain persistent until the end of his life. Notably, it was the discovery of Weber's probabilism that helped push Bourdieu into sociology through the latter's own reinvention and definition of it within the fluid space of French sociology after World War II. We retrace Bourdieu's steps in detail to establish the difference that the incorporation of probabilism made for the development of Bourdieu's budding and influential sociological framework, with lessons for a more general incorporation of probabilism into

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methodology in American sociology. The French text, *Max Weber: Essais Sur La Théorie De La Science* (Paris: Plon, 1965) was edited and translated by Julien Freund. The difference is that this collection of Weber's methodological writings did include a translation of Weber's 1913 *Logos* essay (e.g. "Some Categories of Interpretive Sociology") while Shils and Finch's did not, even though the essay was included in the original German-language equivalent *Gesammelte Aufsätze zur Wissenschaftslehre* (Tubingen: Mohr, 1922).

[518] Even more sympathetic readers of Bourdieu (e.g., Martin, 2018; Wacquant, 2018), who do propose a non-arbitrary relation of elective affinity between the different denizens of Bourdieu's conceptual armamentarium, fail to note that it is (internalized) probability and (objective) chances that represent the connecting thread between all of the key notions. See, John Levi Martin, "Bourdieu's Unlikely Contribution to the Human Sciences" in *Handbook of Pierre Bourdieu* edited by Thomas Medvetz and Jeffrey Sallaza (Oxford: Oxford University Press, 2018), 435-53; Loic Wacquant, "Four Transversal Principles for Putting Bourdieu to Work," *Anthropological Theory* 18, no. 1 (2018): 3-17.

sociology today.

Put simply, Bourdieu became a probabilist to *be* a sociologist, and in this, he mimicked Weber's own path. After recounting this story, we then recast the core concepts of Bourdieu's sociology (habitus, capital, field and *illusio*) into their still unrecognized probabilistic form to illustrate the difference that probabilism makes for concept-formation and what it means for probabilism to be a part of redefining a field like sociology, using an unconventional definition of and approach to sociology in a calculated gamble to change *its* objective chances.

Bourdieu Rediscovers Probabilism

In 1981, Bourdieu was elected to the *Collège de France*, the first sociologist to join the institution since the retirement of Raymond Aron in 1978. Aron, in 1970, had taken up a chair at the *Collège* with the title of "Sociology of Modern Civilization." He was the first sociologist to join the *Collège* since Maurice Halbwachs's tragic death at Buchenwald in 1945, whose chair was titled "Collective Psychology." Halbwachs, meanwhile, had succeeded Marcel Mauss (elected in 1932) whose chair had the title "Sociology." Following the tradition of the *Collège*, those with chairs can rename a chair when one becomes available upon death or retirement, including giving it to another discipline. Halbwachs' chair was not given to another sociologist, however, and the *Collège* lacked the presence of anything that looked like sociology until Claude Lévi-Strauss was elected to a chair in "Social Anthropology" in 1959. In Bourdieu's case, in 1981, the then members of the *Collège* (among them Michel Foucault and the soon-to-be retiring Lévi-Strauss) simply renamed the available chair "Sociology."

By this point, Bourdieu had published his *magnum opus*, *Distinction* in 1984. He had also published its theoretical companion, *Logic of Practice* in 1980, a revised and expanded version of the earlier *Outline of a Theory of Practice,* which came out in 1972. His co-authored work on photography and education had appeared earlier (with *Outline* and *The Inheritors* having already been translated into English by Richard Nice in 1977 and 1979 for the University of Chicago and Cambridge University Press respectively), in addition to a host of articles on rural marriage, the intellectual field, art, structuralism, and Max Weber's sociology of religion (among other topics). Sprinkled among the pages of this work are Bourdieu's well-known concepts and methodology: habitus, capital, symbolic power, fields, correspondence analysis, classification.

Bourdieu had also authored a kind of textbook on sociology a little over a decade before his election to the chair. With co-authors Jean-Claude Passeron and Jean-Claude Chamboredon, Bourdieu published *Le Métier De Sociologue: Préalables Épistémologiques*, featuring a long introductory chapter and conclusion along with a selection of canonical readings, including from Weber, Durkheim and Marx, arranged in between.[519] The book emphasized *epistemological* preliminaries over methodology, as influenced by Bachelard's notion of "epistemological break."[520] Sociology must take as its organizing theme the dictum that "the social fact is won, constructed, and confirmed," which the book resolved into a series of steps.[521] As they envisioned it at this time Bourdieu and co-authors saw sociological explanation as a distinctive part of a coherent scientific community (*cité*), and the *métier* in this sense is based on mutual "epistemological vigilance," particularly against intrusions of "spontaneous" knowledge.[522]

In an important respect, however, it is difficult to reconcile the book's proposals (aside from an aggressive anti-positivism) with what Bourdieu would pursue in the years immediately following its publication, and particularly with what he would go on to propose as "General Sociology" in the first several years of Bourdieu's time at the *College de France.* For example, "practice" is not significant for sociological explanation for Bourdieu in 1968 and neither, we will show, is "objective probability."[523] Given that Bourdieu would pursue these themes extensively in the coming years, it is not unfair to say that he had only dipped one toe into sociology by 1968, rather than a whole foot. So much did Bourdieu's position in sociology in the years leading up to his election remain ambivalent in spite of *Le Métier* that he would (with frequent collaborators at the time like Luc Boltanski) in 1975 found the journal *Actes de la Recherche en Sciences Sociales* as a venue for research that did not fit favorably with, and could not, in fact, be published in, the more established *Archives Européennes de Sociologie* and *Revue Française de Sociologie*.[524]

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[519] Pierre Bourdieu, Jean-Claude Chamboredon, and Jean-Claude Passeron, translated by Richard Nice, *The Craft of Sociology: Epistemological Preliminaries* (Berlin: Walter de Gruyter, 1991/1968).

[520] Gaston Bachelard, *The Formation of the Scientific Mind* (Manchester: Clinamen Press, 2002/1938), 237.

[521] Bourdieu, Chamboredon and Passeron, *The Craft of Sociology*, 57ff.

[522] Ibid, 69ff.

[523] Derek Robbins, "Sociology and Philosophy in the Work of Pierre Bourdieu, 1965-75," *Journal of Classical Sociology* 2, no. 3 (2002): 299-328.

[524] For a firsthand account of founding *Actes*, see Luc Boltanski, *Rendre la réalité inacceptable* (Paris: Seuil, 2008). *Archives* had been founded by Aron, Ralf Dahrendorf and Tom Bottomore in 1960. Jean Stoetzel founded Revue the same year. Both journals sought to provide a counterweight to Georges Gurvitch's *Cahiers internationaux de sociologie* and its

Bourdieu had fallen somewhat backwards into the field of sociology to begin with. We have difficulty finding an adequate cause for his involvement, at least at the very start when it appears mostly because of chance. His *agrégation* at the famed *École Normale Supérieure* was in the equivalent of philosophy (not unusual for a French academic). He completed his *diplômé* there as a translation and commentary on Gottfried Leibniz's *Animadversions* under the directorship of Henri Gouhier. His first teaching post at a *Lycée* in Moulins in 1953 was in philosophy. When he was conscripted into military service in 1955, Bourdieu had to abandon a planned philosophy "doctorate" thesis with Georges Cangeuilhem which had the tentative title of "The Temporal Structures of Affective Life" or "Emotion as a Temporal Structure: An Interpretive Essay on Physiological Data").[525] He was sent to Algeria and his work there (which culminated in two reports that later formed the basis of his first scholarly book *Sociologie de l'Algérie* (1958) with the *Service de Documentation et d'Information of the Gouvernement General* set him on a trajectory that would, somewhat miraculously, culminate with the *Collège de France* election a quarter-century later.

Yet, even throughout the intervening years, which would see Bourdieu (under Aron's sponsorship) become involved, starting in 1960, in what would later be called the *Centre de Sociologie Européenne* and, in 1964, be appointed to the sixth (social sciences) section of the *École Pratique des Hautes Études* (renamed the *École Des Hautes Études en Sciences Sociales* in 1975), it was not clear in what sense Bourdieu could be considered a sociologist and in what respect his work should be read as part of that field, such as it existed at the time. Bourdieu knew enough about the (globally) dominant strains of American sociology (e.g., Harvard functionalism and Columbia-style middle-range theorizing and statistical analysis) at this point to know that he had not been doing *that*, nor did he want to.[526] He also knew he was not pursuing Aron's version, more inclined toward general history and

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heavily theoretical orientation, with *Archives* tending to have a historical and comparative orientation, and Revue a methodological and statistical orientation. *Actes*, by contrast, employed (and still employs) a novel use of empirical documentation (photos, interview fragments, statistical tables) which is visible in Bourdieu's *Distinction*, and with an interdisciplinary and (in contemporary terms) mixed methods focus. More generally, it expressly sought to be "opposed to Parisian fads and intellectual verbalism … thoroughly rooted in empirical research while being critically attuned to important questions in both public and scientific debates." Johan Heilbron, *French Sociology* (Ithaca: Cornell University Press, 2015), 172-73. Earlier (in 1974), Bourdieu had become a founding editor (alongside Randall Collins and Alvin Gouldner) of the American-based journal *Theory & Society.*

[525] Derek Robbins, *The Bourdieu Paradigm: Origins and Evolution of an Intellectual Social Project* (Manchester: Manchester University Press, 2019),136 n5.

[526] Bourdieu provides a revealing anecdote to this effect some 30 years after the fact in his *Sketch for a Self-Analysis*: "American sociology, through the Capitoline triad of Parsons, Merton and Lazarsfeld, subjected social science to

political commentary, or the kind of sociology represented by Alain Touraine, Raymond Boudon or Michel Crozier, all as increasingly prominent by the late 1970s (with Bruno Latour just beginning to lurk along the edges). Touraine was much more well-known than Bourdieu publicly by the late 1970s, and he was also considered for the chair.[527]

All of this makes what Bourdieu would say when he took the lectern for his first public lecture in the mid-afternoon of April 28, 1982, that much more intriguing. He seems to have been encouraged to, as it were, "rise to the occasion" of the chair, something he somewhat mockingly acknowledged in his "*Leçon Inaugurale*" a week earlier and define sociology. For the second time around, sociology had been elevated to this remarkable institutional recognition, following the previous iterations (that could not make it stick) of Mauss and Halbwachs as representatives of a Durkheimian tradition a generation earlier, and hopefully this time it would stick around. Yet, it could only have been with

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a whole series of reductions and impoverishment, from which, it seemed to me, it had to be freed, in particular by a return to the texts of Durkheim and Max Weber, both of whom had been annexed and distorted by Parsons (Weber's work also had to be rethought, to free it from the neo-Kantian coating with which Aron, who introduced it into France, had shrouded it). But to combat this global orthodoxy, it was above all necessary to engage in theoretically grounded empirical research, by refusing both pure and simple submission to the dominant definition of science and the obscurantist refusal of everything that might be or seem associated with the United States, starting with statistical methods. If, in the early 1960s, despite weekly reminders from the authorized representatives of the master in a missionary land, I had stubbornly refused to attend the lectures that Paul Lazarsfeld gave at the Sorbonne, before the assembled world of French sociology, it was because it had all seemed to me more like a collective ceremony of submission than a simple technical enterprise of scientific training and updating." He later describes a private meeting in the late 1960s with Lazarsfeld and Alain Darbel at the Hôtel des Ambassadeurs in Paris, where Lazarsfeld critiqued the mathematical models used in *L'Amour de l'art* (e.g. Pierre Bourdieu and Alain Darbel *The Love of Art: European Museums and their Public*, 1997/1965) for errors that actually turned out to be typesetter misprints. Nevertheless, Lazarsfeld "declared with some solemnity that 'nothing so good had ever been done in the United States.' But he took care never to put it in writing, and continued to give his spiritual investiture to Raymond Boudon, the accredited agent of his scientific multinational." See Pierre Bourdieu, *Sketch for a Self-Analysis* (Chicago: University of Chicago Press, 2004/2000), 73ff. The suggestion here is that, by this point an ascendant American sociology in the triadic mold of Parsons, Merton and Lazarsfeld, had become a global field, shifting the objective probability of every other sociology field, i.e. the chances that some bit of writing, anywhere, would be recognized as "sociology" (see also Michael Strand, "Sociology and Philosophy in the United States Since the Sixties: Death and Resurrection of a Folk Action Obstacle," *Theory and Society* 49 (2020): 101-150, especially p. 126).

[527] Heilbron, *French Sociology,* 186ff. As Heilbron (p. 120-121) notes, because the Durkheimian tradition that both Halbwachs and Mauss represented had failed to "establish" sociology in France in coherent form after Durkheim's death in 1917, the national history of French sociology cannot be characterized by a "rise and fall" narrative as much as by multiple inconsistent appropriations and a kind of splintering, between a research and teaching orientation, between the Durkheimians themselves into different camps by the late 1920s (p. 99-100), and between the university presence of Durkheimianism as "neo-idealist philosophy" combined with "secular republican morality" and the 1930s, as it seemed increasingly out place from the belle époque conditions that gave it birth. Mauss, for instance, was less visible in the broader academic field than the university teachers who rejected Durkheimianism ("not only Durkheimian sociology, but its very aim and style as well") like Georges Gurvitch and Jean Stoetzel, and (later) Aron. It was their sociologies, along with the Durkheimian apologetics of Georges Davy, that would largely serve to define "sociology" for the postwar generation of students: the time during Bourdieu's (born in 1930) formative academic period.

somewhat embarrassed self-doubt that Bourdieu would have thought himself capable of this, given his winding path into the field and his recognition of what it meant for this prestigious institution to now allow sociology, in a less adulterated form than had prevailed in the intervening years, to be taught again within its halls. Bourdieu would go on to dedicate the first five years of lectures at the *Collège* to "General Sociology."

With the complete compendium of all of Bourdieu's lectures at the *Collège de France* now (slowly) finding their way into English translation and publication, it seems warranted to take stock of exactly what these lectures say, and they mean for an increasingly fixed and canonized view of Bourdieu and "Bourdieusian sociology" in the American and global sociology fields. Our argument in this chapter and using this preamble as a way of setting the scene, is that what Bourdieu fashions as "General Sociology" in the first set of lectures has overarching and consistent themes that can only be faintly gleaned from familiarity with his other, more well-known, work.[528]

The Origins of Bourdieu's Probabilism

Throughout the development of his thinking on social action, Bourdieu retains a looping formula codifying the relation of expectation and chance, or "objective probabilities and subjective expectations." As we will see, this does not mean that there are no shifts in emphasis and refinement of the position. Some of the earliest versions appear in *Travail et Travailleurs en Algérie* (1963), of which Bourdieu contributed one half of the book (*Étude Sociologique*) and statisticians from the *Institut National De La Statistique Et Des Études Économiques* Alain Darbel, Jean-Paul Rivet, and Claude Seibel contributed the other half (*Données Statistiques*). In Bourdieu's half, we can find statements like the following:

> Everything happens as if the material conditions of existence exercised their influence on attitudes, and particularly on attitude towards time, that is to say on economic attitude, through the mediation of the perception that the subjects have of it. Indeed, because it is circumscribed by economic and social necessity, the

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[528] Pierre Bourdieu, *Classification Struggles: General Sociology, Volume 1, Lectures at the Collège de France 1981-82* (London: Polity, 2019/1981-82); Pierre Bourdieu, *Habitus and Field: General Sociology, Volume 2, Lectures at the Collège de France 1982-83* (London: Polity, 2020/1982-83); Pierre Bourdieu, *Forms of Capital: General Sociology, Volume 3, Lectures at the Collège de France 1983-84* (London: Polity, 2021/1983-84); Pierre Bourdieu, *Principles of Vision: General Sociology, Volume 4, Lectures at the Collège de France 1984-85* (London: Polity, 2022/1984-85).

> field of possibilities varies as the field of effective possibilities. The economic attitude of each subject depends on his material conditions of existence through the mediation of the objective future of the group of which he is a part or, more precisely, through the mediation of the consciousness, implicit or explicit, that he takes from this objective future.[529]

This, we submit, is not (yet) a statement that is informed by Weberian "objective probability," but rather reflects the influence of the philosopher and pioneering phenomenologist Edmund Husserl, who alongside Martin Heidegger, was a familiar source from Bourdieu's "fieldwork in philosophy", particularly in preparing his proposed dissertation with Georges Canguilhem.[530] Bourdieu appears to combine this with the notion of "effective possibility," which he elsewhere draws from Marx's *Outline of a Critique of Political Economy*, specifically the idea of "effective demand" as demand that reflects the possession of what would be required to obtain its object, versus "demand without effect, without being real, without an object" as being like a fantasy or wish.[531]

A close reading of the essay also conveys aspects of what might have been Bourdieu's abandoned philosophy doctorate, with a noted emphasis on how temporal relations (*sens de l'avenir*) translate into affective experiences like hope, fatalism, paranoia, and the "wild" fantasies and plans that characterize those who have been violently displaced from a structured flow of time.[532] Bourdieu later clearly states that what, in retrospect, the early work in Algeria addresses is how a "particular structure of objective probabilities—an *objective future*—generates determinate dispositions toward the future" (emphasis original). He then restates the formula for *habitus* proposed in *Outline of a Theory of Practice*, published during the intervening years: "These dispositions are structured structures which function as structuring structures, orienting and organizing the economic practices of daily life."[533]

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[529] Pierre Bourdieu, "Etude sociologique," in *Travail et travilleurs en Algerie* (Paris: Mouton, 1963), 346ff (our translation)

[530] Pierre Bourdieu, "Fieldwork in Philosophy" in *In Other Words* (Stanford: Stanford University Press, 1990), 5.

[531] Karl Marx, *Outline of a Critique of Political Economy* edited by Maurice Dobb (New York: International Publishers, 1859/1979), 56.

[532] Bourdieu would return to this theme 30 years later in *Pascalian Meditations* (Stanford: Stanford University Press, 2001/1997), 221ff.

[533] Pierre Bourdieu, *Algeria 1960: The Disenchantment of the World, The Sense of Honour, The Kabyle House or The World Reversed,* translated by Richard Nice. (New York: Cambridge University Press, 1979), vii. Thanks to *Outline*, Bourdieu was better known as an anthropologist than a sociologist in the English-speaking world, part of the then upstart movement of "practice theory." In fact, this is the role in which Bourdieu appears during his (brief) cameo in Anthony Giddens's *Central Problems in Social Theory* (Berkeley: University of California Press, 1979), 25, 217; see also Sherry Ortner,

What is significant about this explicit mention of "objective probability" is that it coincides with Bourdieu's move toward a clearer break with structuralism following 1968. In fact, Bourdieu's entire conception of what counts as "objective" shifts gradually from one grounded in a structuralist conception of objectivity (e.g., objectivity as a subject-less *langue* separated from *parole* or a system of "objective relations" designed and uncovered by the third-person anthropological observer) to an increasingly *probabilistic* conception of objectivity molded in line with Weber's use of Kries' idea of *Chance*. The 1968 English-language essay, "Structuralism and the Theory of Sociological Knowledge," represents the clearest alignment of Bourdieu with structuralism, alongside the essay on the Kabyle house and the aforementioned *Métier*.[534] However, the essay also previews Bourdieu's own (idiosyncratic) "post-structuralism," which he accounts for using nearly the same terminology that he will use to later discuss objective probability, suggesting that probabilism helped Bourdieu resolve the tensions he had recognized in structuralism.

According to Bourdieu, "[the anthropologist] obtains the means to discover how the relations objectively defining the differential *chances* of marriage are realized in and through the attitudes that directly condition the capacity to succeed in the competition for marriage."[535] This argument contains an early version of the expectations-chances loop. The link between the "system of objective relations" uncovered by the structuralist observer and the "attitudes" of actors, in this case, represents an important move *away* from what would otherwise be a satisfactory structural analysis; but it also introduces the paradox of how the two (e.g., chances to marry and attitudes toward marriage) could relate. Bourdieu follows this statement on chances/expectations with an argument that will remain (relatively unchanged) at the core of his resistance to appropriations of structuralism (anthropological, symbolic) that do not remain "methodological."[536]

> To give primacy to the study of the relations between objective relations rather than to the study of the relations between the agents and these relations, or to ignore the question of the relationship between these two types of

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"Theory in Anthropology Since the Sixties," *Comparative Studies in Society and History* 26, no. 1 (1984): 126-66.

[534] Pierre Bourdieu, "Structuralism and the Theory of Sociological Knowledge," *Social Research* 35 (1968): 681-706; Pierre Bourdieu, "The Berber House or the World Reversed," *Social Science Information* 9, no. 2 (1970): 151-170; Bourdieu, Chamboredon and Passeron, *The Craft of Sociology*.

[535] Bourdieu, "Structuralism," 704-705.

[536] Omar Lizardo, "Beyond the Antinomies of Structure: Levi-Strauss, Boudieu, Giddens and Sewell," *Theory and Society* 39 (2010): 651-688; Bourdieu would keep this methodological stance all the way through to *Pascalian Meditations,* p. 176-77.

> relations, leads to the *realism of the structure* which, taking the place of the realism of the element, hypostatizes the systems of objective relations in already constructed totalities, outside the history of the individual or the group. Without falling back into a naive subjectivism or "personalism," one must remember that, ultimately, *objective relations do not exist* and do not really realize themselves except in and through the system of dispositions of the agents, produced by the internalization of objective conditions.[537]

Bourdieu uses these arguments to characterize the mediating role of *habitus* as a "geometrical locus of determinisms and of an individual determination, of *calculable probabilities* and of lived-through hopes, of objective futures and subjective plans."[538] The intriguing thing about this proposal, and which is also evident in the 1979 preface to the collection of Bourdieu's writings in *Travail et Travailleurs* from 1963, is that habitus is directly connected to probability here (e.g., chance-expectation connection with habitus as a mediator) thus avoiding the (substantialist) tendency of structuralism to commit to a "realism of the structure," while also staying clear from a "subjectivist" counter-reaction in which the placement of action within a system of objective possibilities is denied. The counterpart to *habitus* (as the other element of the relation between "subjectivity" and "objectivity") is still murkily defined in terms of the "constructed" objectivity of the structuralist method.[539] "Field" (*champ*) is not yet found in these arguments.

Neither is it present in the arguments found in Bourdieu's co-authored (with Passeron) research on education from this period, *The Inheritors* (1964) and *Reproduction in Education, Society and Culture* (1970).[540] The latter includes phrases that resonate directly with those found in "Structuralism" from 1968 and extending back to *Travailleurs* from 1963. Take for instance the claim that

> [t]he concept of subjective expecta-tion, conceived as the product of the internalization of objective conditions through a process governed by the whole system of objective relations within which it takes place, has the theoretical function of designating the intersection of the different systems of

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[537] Bourdieu, "Structuralism," 705.

[538] Ibid , 705 (emphasis added).

[539] In these early (pre-1973) writings Bourdieu operates with an ambiguous (regarding the epistemic/ontic distinction) notion of "objective" (position, relations, etc.) modeled after structuralism, but which weill later recast in a less ambiguous ontic manner in terms of objective probabilities *qua* fields.

[540] Pierre Bourdieu and Jean-Claude Passeron, *The Inheritors: French Students Relation to Culture* (Chicago: University of Chicago Press, 1979/1964); Pierre Bourdieu and Jean-Claude Passeron, *Reproduction in Education, Society and Culture* (Beverly Hills: Sage, 1990/1970).

> relations…[This is] explanation in terms of the relationship between subjective expectation and objective prob-ability, i.e., in terms of the system of the relations between two systems of relations.[541]

This rendering of probability combines its methodological meaning (statistically derived) with a somewhat shadowy and awkwardly phrased structuralism ("the system of relations between two systems of relations"). This makes any reference to "objectivity" ambiguous because, as Bourdieu notes, it cannot carry ontological status without the danger of reifying the constructive operations of the sociologist. The popularity of these arguments in the sociology of education, meanwhile, have made terms like *habitus* inconsistent with Bourdieu's later (especially in *Pascalian Meditations*) probabilistic rendering of the same terms. As is particularly evident in the "Structuralism" essay and Bourdieu's initial application of *field,*[542] the absence of an understanding of objective probability pre-1973 has resulted in an analytic overreliance on "systems of relations," something which remains overextended in Bourdieu scholarship to the present-day.[543]

From the very start, Bourdieu's conception of habitus had involved a deeper connection with probability than has been appreciated, specifically that habitus consists of the internalization of objective probabilities.[544] Furthermore, Bourdieu had begun to theorize the origins of internalized probability as linked to the connection between "agents and objective relations" (ambiguously conceived as "objective" in the usual sense of non-subjective, but also as an epistemic construction by the analyst). As Bourdieu develops his thinking in this regard, he gradually drops reference to "objective relations" (or "systems of relations") in the way structuralists (whether in linguistics or social anthropology) used the term and moves toward a characterization of a chances-expectations loop in terms of the dialectic between *internalized probability and objective probability.* The difference between "objective chances" referred to after the incorporation of Weber's probabilism (post-1973) and "objective relations" subjected to a "methodological structuralist" critique is that objective probability is unambiguously *ontological*.

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[541] Bourdieu and Passeron, *Reproduction*, 156.

[542] Pierre Boudieu, "Intellectual Field and Creative Project," *Social Science Information* 8, no. 2 (1969): 89-119. Translated by Sian France from "Champ intellectuel et projet créateur," *Les temps modernes* (November 1966): 865-906.

[543] Mustafa Emirbayer and Victoria Johnson, "Bourdieu and Organizational Analysis," *Theory and Society* 37: 1-44.

[544] A rare exception is found in David Swartz, "The Sociology of Habit: The Perspective of Pierre Bourdieu," *OTJR: Occupation, Participation and Health* 22, no. 1 (2002): 61S-69S, see especially p. 64ff.

Objective Probability After *Logos*

Bourdieu's arguments before 1973 remain directly uninfluenced by Weber's 1913 essay, which was our focus in the last chapter, and his proposal, informed by Kries' probabilism, that "objective probability" should be at the core of any interpretive sociology. Bourdieu's "message in a bottle," as we labeled it earlier, the 1973 English-language article "Three Forms of Theoretical Knowledge," is rightfully acknowledged as a pivot point in his thinking.[545] The article condenses and further develops points from *Outline*, summarizing various developments that would make their way to *Logic,* while also indicating a more thorough connection to Weber's "objective probability." While the 1973 article includes no citations of Weber, it does include a notable mention of the German sociologist:

> [S]omeone who accepts money as an instrument of exchange implicitly takes into account, as Weber shows, *the chances that other agents* will agree to recognize its function. Automatic and impersonal, significant without intending to signify, the ordinary conduct of life lends itself to a no less automatic and impersonal decoding: the *decoding of the objective intention* which they express in no way requires the 'reactivation' of the intention 'experienced' by the person who accomplishes this conduct.[546]

Revealingly, this statement features a more explicit critique of an interpretivist approach while leveraging a version of the expectation-chance connection as directly impacting the course of action. Accordingly, rather than interpreting what someone will do when we give them money by "reactivating" their intentions (beliefs, desires), it is the "automatic and impersonal" recognition of objective probabilities, allowing for the "decoding of objective intention," that matters in this sequence. Compare this to the following claim from Weber's 1913 *Logos* essay:

> An important (though not indispensable) normal component of social action is its meaningful orientation to the expectations of certain behavior on the part of others and, in accordance with that, orientation to the (subjectively) assessed probabilities (*Chancen*) for the success of one's own action. A most understandable and important basis for the explanation of action therefore is the *objective existence of these probabilities*, i.e., a greater or lesser degree of probability as expressed in a '*judgment of objective possibility,*' to the effect that these

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[545] See Derek Robbins, "Sociology and Philosophy," 320ff.

[546] Pierre Bourdieu, "Three Forms of Theoretical Knowledge," *Social Science Information* 12, no. 1 (1973): 53-80, quotation is on p. 70 (emphasis added).

> expectations are well-founded.[547]

It seems likely that when composing the earlier passage Bourdieu had this specific argument in mind, suggesting that he had now read the 1965 Freund translation. Instead of decoding intentions, Weber concentrates on the "judgment of objective possibility" concerning the "objective existence of probabilities." In different terms, this is almost directly comparable to the *relation* that, in 1968, Bourdieu used to make his early proposal for habitus. He now begins to phrase that relation as a *loop*.

In the 1973 article, Bourdieu helps himself to the idea of "objective probability" when trying to differentiate the way he believes the *habitus* engages in expectations from more "naive" models (later to be referred to as "rational choice") whereby people construct in a conscious, strategic manner, "what the habitus carries out in another manner, namely an estimate of the chances based on the transformation of the past effect into anticipate future effect."[548] In this connection, Bourdieu notes that "[o]ne regularly observes a very close relationship between scientifically constructed *objective probabilities* (e.g., opportunities for access to higher education or to museums, etc.) and *subjective aspirations*."[549] This reiterates that a mutual adjustment does not happen via conscious regulation. Bourdieu does not mention Weber in this context, yet the connection to Weber's *Logos* essay becomes fully explicit with Bourdieu's 1974 article "Avenir de classe et causalite du probable."

> Consider *the Weberian theory of 'objective probabilities',* which has the merit of bringing to light one of the most fundamental assumptions, although tacit, of the economy, namely the existence of a 'relation of intelligible causality' between generic chances ('typical') 'existing objectively on average' and 'subjective expectations'. *By speaking of 'average chances',* that is to say, valuable for anyone, for an indeterminate and interchangeable agent, a 'one', as Heidegger would say, and by recalling that rational action, 'carefully' orientated [*sic*] according to what is 'objectively valuable', is that which 'would have happened if the actors had knowledge of all the circumstances and all the intentions of the participants', that is to say, what is 'valuable in the eyes of the scientist', who is the only one capable of constructing by calculation the system of objective chances to which an action accomplished in perfect knowledge of its causes should adjust, Max Weber clearly showed that the pure model of rational action cannot be considered as an anthropological description of practice.[550]

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[547] Max Weber, "Some Categories of Interpretive Sociology," *Sociological Quarterly* 22, no. 2 (1981): 151-180, quotation is on p. 159.

[548] Bourdieu, "Three Forms," 64.

[549] Ibid, 65 (emphasis original).

[550] Pierre Bourdieu, "Causality of the Probable and the Future of Class" translated by Michael Grenfell in

Bourdieu includes a footnote here to Weber's 1913 *Logos* essay collected in Freund's (1965) edited volume.[551] This, we argue, is a crucial turning point because it appears that having Weber's 1913 argument for objective probability firmly in hand allows him to (re)state the relation between expectation and *Chance* in a much more consistent and comprehensive way, specifically as a *looping relation*. For our purposes, this secures the fact that integral to Bourdieu's sociology is a concern with probability, though in such a heterodox form that it easily goes unrecognized and remains essentially irrelevant to conversations on prediction and probability in sociology that are, by contrast, far narrower in their methodological focus.

Internalized and Objective Probability in *Logic of Practice*

In *The Logic of Practice,* the connection to Weber's 1913 essay becomes further explicit, as it becomes foundational to Bourdieu's well-traveled theory of *habitus*. The argument here, however, is that habitus connotes the internalized form (in people) of what exists (in the world) as probability (or objective possibility). This had been integral to Bourdieu's conception of habitus since at least 1973, when he starts to draw on Weber's *Logos* essay. *Logic* is a revision of the earlier *Outline* and a development of points mentioned in the 1973 "Three forms" piece and a 1976 *Actes* article *"Le Sens Pratique."* Importantly, between *Logic* and *Outline,* Bourdieu added an entirely new chapter, namely, "Belief and the Body," which draws out and highlights points that were more scattered in *Outline*. The revision also includes a discussion of the philosopher (and classical probability theorist) Blaise Pascal's famous "wager" that is missing from both *Outline* and "Le sens pratique." The greater incorporation of Weber's "objective probability" and this new incorporation of Pascal indicate that at, arguably the pivotal moment of its conceptual formation, habitus becomes tightly linked to internalized probability.

This link becomes particularly apparent in a curious string of references present in *Logic* but found nowhere in either the *"Le sens pratique"* or the earlier *Outline*. They account for a form of *probability learning*, namely by making the habitus a *product* of probability learning.

Rethinking Economics edited by Asimina Christoforou and Michael Lainé (London: Routledge, 2014), 247-284, quotation is on p. 235.

[551] Bourdieu, *ibid*, 260 n7.

> [D]ispositions durably inculcated by the objective conditions and by a pedagogic action that is tendentially adjusted to these conditions, tend to generate practices objectively compatible with these conditions and expectations pre-adapted to their objective demands (amor fati) (for some psychologists' attempts at direct verification of this relationship, see Brunswik 1949; Preston and Barrata 1948; Attneave 1953). As a consequence, they tend, without any rational calculation or conscious estimation of the chances of success, to ensure immediate correspondence between the *a priori* or *ex ante* probability conferred on an event (whether or not accompanied by subjective experiences such as hopes, expectation, fears, etc.) and the *a posteriori* or *ex post* probability that can be established on the basis of past experience.[552]

Later, on the same page mentioned earlier, Bourdieu includes his most direct reference to Weber's *Logos* essay to date, with "1922" being a reference to the original German-language collected volume where the essay appears.

> They thus make it possible to understand why economic models based on the (tacit) premise of a 'relationship of intelligible causality', as Max Weber (1922) calls it, between generic ('typical') chances 'objectively existing as an average' and 'subjective expectations', or, for example, between investment or the propensity to invest and the rate of return expected or really obtained in the past, fairly exactly account for practices which do not arise from knowledge of the objective chances.[553]

Here Bourdieu dissects, draws out and emphasizes Weber's major points in the 1913 *Logos* essay, all revolving around the key idea of objective probability. Specifically, that knowledge of "average chances" can produce a kind of "objectively correct rationality" without any kind of explicit instruction or knowledge of "objective chances" such as would be produced by a sociologist or statistician.[554] Probability learning, in this case, can explain the kind of looping effect (e.g., "near-circular relationship") that Bourdieu wants to capture in his much-bemoaned definition of habitus given earlier in the chapter (e.g., "… structured structures predisposed to function as structuring structures…"). Bourdieu's earlier discussion in *Logic*, which is also directly linked to his added chapter in the book ("Belief and the body"), of Pascal's wager thus becomes relevant in a way that has not been appreciated to date by suggesting that the breakthroughs on probabilism that Bourdieu makes during the 1970s that culminate in *Logic* will continue to preoccupy him for the rest of his career and find their last statement in the appropriately titled *Pascalian Meditations*.[555]

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[552] Pierre Bourdieu, *The Logic of Practice* (Stanford: Stanford University Press, 1990/1980), 63.

[553] Bourdieu, *Logic of Practice,* 63.

[554] Weber, "Some Categories," 157. Bourdieu would later critique this particular Weberian characterization as an instance of (one version of) the "scholastic" way of defining the chance-expectation loop (characteristic of marginalist economics) while at the same time acknowledging that in deploying the (idealized) notion of average chances "Max Weber at least had the merit of tacitly taking account of the inequality of chances, which he placed at the center of his theory of stratification." Bourdieu, *Pascalian Meditations*, 219-20.

The series of references in the first quote above—Brunswik, 1949; Preston & Baratta, 1948; Attneave, 1953—are all to psychologists institutionally affiliated with mainstream departments in the U.S. and working in the "neobehaviorist" line of research (because accommodating of such constructs as "purpose" and "goals") developed by Edward Tolman and Egon Brunswik. [556] Of particular interest is the Attneave study. Here 100 subjects were tested according to how much they internalized letter frequencies from the English alphabet as present in natural language. The hypothesis being tested is whether because these letters appear with stable relative frequencies in natural language, this can prove "*probability learning*" by adults as they "observe these proportions…throughout their entire lives."[557]

To draw out a possible probability learning mechanism, the experimental study separated the subjects into three groups and asked them to guess the relative frequency of each letter of the alphabet that would appear in a random newspaper clipping with a thousand total letters. A first group was given no indication of the relative frequency of letters in the clipping. A second group was told that they have "approximately uniform frequency." Finally, a third group was told the letters appear with "English text frequencies." Attneave found that the third group, by a significant margin, came closest to guessing the actual frequency of each letter as it appeared in the article (with a logged average of .88).[558] Not to be overlooked, the other two groups' guesses were significantly above zero. For Attneave, this provides some evidence of probability learning, or how "psychological probabilities [do seem to] correspond to their environmental counterparts," at least when "they are appreciated and utilized by the observer."[559] This evidently suggests a connection between "probability learning" and practice, such that if the subjects were asked to guess the frequency of a different alphabet, or something with which they had no practical experience, we should not expect a psychological/environmental correspondence, and certainly not at such a high ratio.

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[555] Bourdieu, *Logic of Practice*, 48-49; Bourdieu, *Pascalian Meditations*. That *The Logic of Practice* was the underlying theoretical engine of Bourdieu's epoch-making *Distinction* (Cambridge: Harvard University Press, 1984) see Omar Lizardo, "Taste and the Logic of Practice in Distinction," *Czech Sociological Review* 50, no. 3 (2014): 335-364.

[556] Edward Tolman and Egon Brunswik, "The Organism and the Causal Texture of the Environment," *Psychological Review* 42, no. 1 (1935): 43–77; Egon Brunswik, "Systematic and representative Design of Psychological Experiments: With results in physical and social perception" in *Proceedings of the Berkeley Symposium on Mathematical Statistics and Probability*, (Berkeley: University of California Press, 1949), 143-202; F. Attneave, "Psychological probability as a function of experienced frequency." *Journal of Experimental Psychology* 46 no. 2 (1953): 81–86; Malcolm Preston and Phillip Baratta, (1948), "An experimental study of the auction-value of an uncertain outcome." *The American Journal of Psychology* 61, no. 2 (1948): 183–193.

[557] Attneave, "Psychological Probability," 81 (emphasis original).

[558] Ibid, 84.

Bourdieu's Path to Probabilism

This otherwise obscure study marks an early attempt at what has only more recently been documented as language acquisition as learning, which is a key demonstration of contemporary probabilism.[560] Why this is important for understanding Bourdieu's trajectory is that it marks a kind of culmination of shifts in his thinking from 1973 forward, after his encounter with Weber's 1913 *Logos* essay and its fundamental breach of conventions surrounding probability. The trajectory of this story finds Bourdieu encountering Weber's probabilism, most likely Weber's 1913 *Logos* essay, in the early 1970s, likely after 1968 and before 1973. As we noted in the close reading at the end of Chapter 2, probabilism first appears in Bourdieu's article from 1973 "Three Forms of Theoretical Knowledge," which has been subsequently appreciated as a central contribution to the development of Bourdieu's unique conceptual framework. Notably, this also seems to have been one of the earliest formulations of Bourdieu's original sociological framework, which finds a thorough expression in his *College de France* lectures in the early 1980s. Importantly, Bourdieu's shift toward probabilism coincided with his own version of post-structuralism, as Bourdieu retooled structuralist principles in his further development of what would become a distinct bank of sociological concepts, particularly habitus, capital, and field.

Central to Bourdieu's trajectory during this time is the renewed attention he would give to the concept of field. Before the early 1970s, Bourdieu rendered fields as essentially structuralist spaces of "systems of relations."[561] Yet between May 1972 to January 1975, Bourdieu would give a seminar series at the *Maison Des Sciences De L'homme* on the concept of field, to which he gave the indicative title: "De la methode structural au concept de champ" (e.g. "From the structural method to the concept of field").[562] This (nearly verbatim) move toward a post-structuralism occurs in tandem with what we claim is Bourdieu's encounter with Weber's objective probability and his incorporation of it into the concept of field as now referring to spaces of objective probability.

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[559] Ibid, 81.

[560] See, Vsevold Kapatsinski, *Changing Minds, Changing Tools: From Learning Theory to Language Acquisition to Language Change,* (Cambridge: MIT Press, 2018).

[561] While Bourdieu used the category of "field" (champ) as early as 1963 in *Travail et Travailleurs en Algérie* and, most influentially, in "Intellectual field and creative project" from 1966, he did not link it to habitus until (it appears) *Outline of a Theory of Practice* (p. 176) published in 1972, specifically with this statement: "quasi conscient l'opération que l'habitus réalise sur un autre mode à savoir *une estimation des chances* supposant la transformation de l'effet passé en avenir escompté, il reste qu'elles se définissent d'abord par rapport à *un champ de potentialités objectives*" (emphasis added). Important to note here is the mention of "potentialités objectives" as part of the habitus/field link. Bourdieu also

Beyond this they indicate a shift away from the authority encased in probability when it takes a purely *epistemic* form, and beyond the power-knowledge rooted in structuralisms that do not appreciate themselves as methods rather than theoretical statements that hook into reality. The *Logic of Practice* also includes an analysis of Pascal's Wager in which Bourdieu accuses Pascal of a kind of rationalist fallacy: "conceiving of belief in terms of the logic of decision," thus engaging the paradox of *deciding* to believe.[563] Yet what Bourdieu specifically draws out of Pascal's argument is the insight that we form beliefs as habits, how this ties belief in a relation to time, and coincides closely with expectation and presumption. The overwhelming power of these attributes, which Pascal tries to overcome by rational force, is why decision remains enfeebled as a source of belief by itself, even in the face of evidence that gives you reasons why you *should* believe.[564] Bourdieu does something comparable to other probabilistic thinkers, like Kries, to get around paradoxes that arise from using probabilistic analysis to decide what to believe and how to act (what to wager), as evident in the St. Petersburg Paradox.

This and the other arguments that Bourdieu arrives at by the end of the 1970s reveal something much larger, however, with an impact extending far beyond mere Bourdieu exegesis and lore. Across the 1970s, from the founding of *Actes* to this incorporation of probabilism, Bourdieu is fighting the epistemic authority that he finds in structuralism that does not appreciate itself as a method but instead as a statement of reality, and here in the use of probability inherited from the frequentism of

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does not mention "potentialités objectives" explicitly in line with Weber's "objective probability" until 1974. In the 1977 English edition of *Outline* (p. 76) Richard Nice translates the original "un champ de potentialités objectives" as "a system of objective potentialities." In the "Three forms of theoretical knowledge" essay this is translated as "a field of objective potentialities" (p. 64).

[562] Pierre Bourdieu, "Séminaires sur le concept de champ, 1972-1975: Introduction by Patrick Champagne." *Actes de la recherche en sciences sociales* 200 (2013): 4–37.

[563] Bourdieu, *Logic of Practice*, 48-49. The reference to "deciding to believe" comes from Bernard Williams, "Deciding to Believe," in *Philosophical Papers: 1956-1972* (Cambridge: Cambridge University Press, 1973), 136-151.

[564] Michael Strand and Omar Lizardo, "The Hysteresis Effect: Theorizing Mismatch in Action," *Journal for the Theory of Social Behaviour* 47, no. 2 (2017): 164-94.

the 19th century and professionalization of statistics.[565] Bourdieu falls later in this history, which means he can observe what it has meant for the human sciences, especially for sociology in what had become its mainstream American version. Bourdieu's 1970s trajectory, particularly after the publication of the *Le Métier De Sociologue*, reveals a discomfort with having, by this point, become a purveyor of a kind of authoritative mental labor, which created and then imposed categories on the folk, with the aim of "truth" being the folk's transformation into the kind of people who hold and speak such categories.[566] Bourdieu scholar Derek Robbins suggests that Bourdieu realized how his earlier work rooted in the structuralist and probabilist forms of authoritative knowledge "[betrayed] the primary, domestic, or familial experiences of his upbringing in the Béarn and the primary experiences that he had observed among the Kabyle in Algeria."[567] Bourdieu would thereafter seek to avoid "simply [being] part of a process of consolidating the self-referentiality of an introspective and socially distinct sociological epistemic community."[568]

This, as indicated in earlier chapters, holds lessons for the human sciences today and, for the future of social theory specifically, holds a potential mode of opposition to the authoritative mental labor that data science could (or already has) become on scale far surpassing Bourdieu's worst nightmares. Our task now is to account for Bourdieu's most famous concepts as distinctively *probabilistic*, as versions, in other words, of a probabilistic sociology that we will thereafter flesh out in greater detail. If true, the concepts of field, habitus, capital and *illusio* mark the most thorough development of probabilism in sociology to date, building off Weber's own claims to the same effect, his own novel categories appropriated from Kries ("objective probability," "objective possibility"), and in particular the key idea of the looping effect. However, Bourdieu the probabilist goes beyond Weber the probabilist. We can see key principles from Weber's earlier formulations adapted to become more generally applicable for sociological analysis, at a variety of scales of generality and duration: objective possibility is linked to field, expectation to habitus, and judgments of objective probability to capital.

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[565] Gerd Gigerenzer, Zwent Swijtink, Theodore Porter, Lorraine Daston, John Beatty and Lorenz Kruger, *The Empire of Chance: How Probability Changed Science and Everyday Life* (Cambridge: Cambridge University Press, 1989), chap. 3,

[566] See John Levi Martin, *The Explanation of Social Action* (Oxford: Oxford University Press, 2011); Strand, "Sociology and Philosophy in the United States Since the Sixties."

[567] Derek Robbins, "Theory of Practice" in *Pierre Bourdieu: Key Concepts,* edited by Michael Grenfell (London: Routledge, 2012), 35.

[568] Ibid, 35.

These concepts are the products of a variety of influences, as has been documented before, reflecting Bourdieu's own synthetic method of concept-formation. Nevertheless, the consistency with which Bourdieu appeals to the loop idea (from 1973 all the way to *Pascalian Meditations*), and his consistent mentions of "the relationship of expectations and chances," indicates the central place that probabilism plays in his efforts, and this not only includes Weber.[569]

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[569] See, for instance, Bourdieu, *Pascalian Meditations*, 231ff.

Chapter 8 - Elementary Forms of Probabilistic Reasoning in Bourdieu's General Sociology

> *There will be no return to those social universes in which the quasi-perfect coincidence between objective tendencies and subjective expectations made the world a continuous interlocking of confirmed expectations. The lack of a future, previously reserved for the "wretched of the Earth," is an increasingly widespread, even modal experience.*
>
> ~ Pierre Bourdieu, *Pascalian Meditations*

The previous chapter concentrated on a turning point in the trajectory of Bourdieu's thought that was marked most of all by his direct incorporation of a brand of probabilism drawn from Max Weber into what would eventually become his familiar and influential sociological conceptual framework of habitus, field, and capital. Yet, while Bourdieu's original concepts have been in large part rendered conventional by use and repetition, their genealogy rests in what we have argued is Bourdieu's probabilistic turn in the early 1970s. That this has been overlooked despite volumes of Bourdieu commentary and exegesis over the years is not surprising given how counterintuitive "objective probability" is relative to the de facto understanding of probability as methodology and epistemology in anglophone sociology.

What we seek to do in this chapter is to take the conventional meanings of habitus, capital, field, *illusio,* and power, and recast them in probabilistic terms, to show the *conceptual* difference objective probabilism makes when given broad application. The core concepts, with their usual definitions on the left, and their probabilistically recast definitions on the right are shown in Table 1. To accomplish this, we concentrate on the last two, big "theory" works after *The Logic of Practice*: Bourdieu's *Cours de Sociologie Générale* (1981-1986) given as his initial years of lectures following his election to the *College de France* and his 1997 book *Pascalian Meditations*. These efforts, particularly the last, mark the furthest development of Bourdieu's probabilism, incorporating it into general sociological principles that have what we will argue are significant empirical implications.

Concept	**Non-Probabilistic Meaning**	**Probabilistic Recasting**
Habitus	"… structured structures predisposed to function as structuring structures" for systematic production of thoughts, perceptions and actions" (Bourdieu, 1990, p. 53)	The learning of **objective probabilities** offered by a *field* and generative of practical anticipations that tend to adjust action in the present to the future **objective Chances** by the field.
Field	"[S]tructured spaces of positions (or posts) whose properties depend on their position within these spaces and which can be analyzed independently of the characteristics of their occupants (which are partly determined by them)" (Bourdieu 1993, p. 72). Position-takings in a field are indicative of a struggle over the monopoly of symbolic capital.	Delimited arenas of striving, characterized by a given (unique) distribution (a "play space") of **objective Chances**, partially determinative of individual trajectories and regulated temporal successions to which individuals adjust to via an anticipatory *habitus*.
Capital	Resource at stake in a struggle between commonly oriented actors, which can also be transformed into other resources when transferred outside the field.	A set of unequally distributed (or in an ideal case, monopolized) resources (cultural, social, economic, etc.), allowing individuals to better grasp the **objective Chances** distributed within a *field* via an anticipatory *habitus*. More consequentially, capital may be used to alter the structure of **objective probabilities** constitutive of a field, thus having an indirect influence on the anticipatory moves of other players.
Illusio	Interest or investment in the contest or "stakes" taking place in a field.	Subjective motivation to in-vest in a game offered by the **objective probabilities** constitutive of a *field*, fueled by the capacity to use practical expectations of the *habitus* to link to **objective Chances**, thus 'buying into' the game.

Table 1: A Probabilistic Recasting of the Core Concepts of Bourdieu's General Sociology.[570]

Sociology, as Bourdieu argues, consists of a form of mental labor that makes and uses classifications, and it does this amid other specialists competing to "establish the existence of groups."[571] Between classifications and objective probability is a relative match or mismatch related to their *mutually independent* effects on group-making, which Bourdieu describes in elaborating these points as the relationship between the "theoretical and practical existence of groups."[572][1] The significance of "symbolic structures" for prediction-making is rarely acknowledged.[573] Yet, the creation of explicit and public (e.g., "group-making") classifications, in which sociology (as mental labor) is closely involved, generates "*recognized distinctions*" and provides a means with which to make *predictions* (e.g., "presuppositions") about the persons fitted to them.[574]

In a keynote lecture delivered at the University of Chicago in 1987 and addressing the analytic challenge of differentiating between the theoretically constructed groups (or classes) of the sociological analyst and the actual (practically existing) groups in the world, Bourdieu goes on to define both the "classes on paper" and the *structure of the social space* generating the counterpart "groups in the world" to which these classes (may) refer in terms of *probability*:

> The theoreticist illusion which grants reality to abstractions hides a whole series of major problems, those which the very construction of well-founded theoretical classes allows us to pose when it is epistemologically controlled:

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[570] Note that the table should not be read as a substantive claim that there is a "left-to-right" shift in Bourdieu's conceptualization of the relevant notions, or an "early" versus a "late" Bourdieu, although as we argue throughout, the specific conceptualizations on the right appear later in Bourdieu's larger body of work (and are layered on top of or next to the ones on the left), as he works out the implications of probabilism in the General Sociology lectures and one last time in *Pascalian Meditations*.

[571] Pierre Bourdieu, *Classification Struggles: General Sociology, Volume 1, Lectures at the Collège de France 1981-82* (London: Polity, 2019/1981-82), 79.

[572] Pierre Bourdieu, "What Makes a Social Class? On the Theoretical and Practical Existence of Groups," *Berkeley Journal of Sociology* 32 (1987): 1-17.

[573] Though, Luc Boltanski and Laurent Thevenot, who at the time were in the midst of distancing their work from Bourdieu, for whom they had both worked closely (particularly Boltanski), retain something of this perspective in their influential "Finding One's Way in Social Space: A Study Based on Games," *Social Science Information* 22, nos. 4-5 (1983): 631-80.

[574] Pierre Bourdieu, "Symbolic Capital and Social Classes," *Journal of Classical Sociology* 13, no. 2 (2013/1978): 292-302, quotation is on p. 297 (original emphasis). "Social groups, and especially social classes, exist twice, so to speak, and they do so prior to the intervention of the scientific gaze itself: they exist in the objectivity of the first order, that which is recorded by distributions of material properties; and they exist in the objectivity of the second order, that of the contrasted classifications and representations produced by agents on the basis of a practical knowledge of these distributions such as they are expressed in lifestyles" (296).

> a theoretical class, or a "class on paper," might be considered as a *probable* real class, or as the probability of a real class, whose constituents are likely to be brought closer and mobilized (but are not actually mobilized) on the basis of their similarities (of interest and dispositions). *Likewise the social space may be construed as a structure of probabilities* of drawing individuals together or apart, a structure of affinity and aversion between them.[575]

Bourdieu differentiates an *epistemic* sense of probability (e.g., the "probable" classes constructed by the analyst) which *may* point to actual classes in the world; but because mental laborers like sociologists cannot claim a monopoly on probability, it may *not*. This is the oft-noted point that classes "on paper" seldom correspond to "real" groups. However, Bourdieu makes an additional *ontological* claim on these grounds: "Groups in the world" are probabilistic in a non-epistemic sense. Potential groups in the world take the form of *habitus* (learned probability) and *capital* (capacity to shape objective probability) relative to *fields* (spaces of objective probability). This means there is a relevant contrast to draw between groups formed in fields versus *apparatus* (spaces of determinism) or *games of chance* (spaces of randomness). Probability-in-action takes form as *illusio* as an investment in (and vulnerability to) a probabilistic structure, its tests and risks.

Like Weber, Bourdieu proposes an interpretive sociology that meets and recognizes agents in the world rather than imposing an interpretive scheme on them. The "gap" between analyst and agent (whether this gap applies to action, motivation, or the existence of groups) is closed instead by focusing on their mutual (egalitarian) relation to probability.[576] Nowhere in Bourdieu's *oeuvre* is this made more apparent than in the early *Cours* lectures and in *Pascalian Meditations*, which appear as key statements informed through and through by probabilism. What does this mean for these concepts (habitus, field, capital) for which Bourdieu is so closely associated, and which has made him a kind of new "classic" in sociology, given the depth and range of his influence? We will consider these concepts as potential anchors for doing sociology with a probabilistic frame of mind.

Habitus

Among the host of other influences on Bourdieu's conception of habitus, an important one is what Bourdieu finally arrives at in *Logic of Practice*, namely "learning probability" as we emphasized in the last chapter, and this makes a significant difference.[577] Since at least the early 1970s, Bourdieu had been slowly unveiling the elements of his *gnoseologica inferior* (e.g., temporal experience, practice, qualitative immediacy), or a science in which knowledge assumes a "reverse hierarchy," a "science of knowledge that is inferior…because its object is inferior" and subject to contempt, with its closest cousins being phenomenology, ethnology and aesthetics.[578] This promotes a knowledge of probability that, true to form, *reverses the hierarchy* that remains implicit to a strictly methodological appropriation of probability.

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[575] Bourdieu, "What Makes a Social Class?", 7 (emphasis added).

[576] Pierre Bourdieu, *The Logic of Practice,* (Stanford: Stanford University Press, 1990/1980), 54.

Thus, Bourdieu uses internalized probability to redeem, more explicitly than before, the kind of "rational/reasonable practice" that comes from learning probability *without* technical tools. Early in the *Cours,* Bourdieu describes internalized probability by borrowing terms from Husserl, specifically "habituality" and "experience." Bourdieu quotes from Husserl's *Experience and Judgment*, highlighting specifically the analysis of the word "experience," then adds the following commentary:

> I found this text very striking, because it basically expressed the essence of what I wanted to find in the notion - that is, both an experience in the sense of the something 'acquired through experience', by confrontation with the patterns of the social world, with the emphasis on the mode of acquisition, and the experience that enables us to get by in life, to be experience, which gives us, as Husserl says, 'assurance in decision and action in the situations of life.[579]

This draws Husserl's phenomenological framework into Bourdieu's concern with learned probability, which Bourdieu uses, in line with Husserl's emphasis in his approach, to *redeem* the validity of probability (as synonymous with Husserl's "experience") as having a colloquial meaning even if it is not something that could be measured or recognized exclusively via technical epistemic practices. This is again with the orientation of remaking sociology in a *gnoseological inferior* mold and breaking down knowledge-political barriers rooted in epistemic authority, particularly as rooted in the generaling effect of "representing" using authoritative concepts. Bourdieu takes this discussion further, referencing Husserl's theme of "habituality" from his *Cartesian Meditations*[580] specifically the section

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[577] Loic Wacquant, "A Concise Genealogy and Anatomy of Habitus," *Sociological Review* 64, no. 1 (2016): 64-72.

[578] Pierre Bourdieu, *Habitus and Field: General Sociology, Volume 2, Lectures at the Collège de France 1982-83* (London: Polity, 2020/1982-83), 101.

[579] Ibid, 101; the Husserl quote is from *Experience and Judgment* (Evanston: Northwestern University Press, 1973/1948), 68.

[580] Edmund Husserl, *Cartesian Meditations: An Introduction to Phenomenology* (The Hague: Martinus Nijhoff,

"habituality as the substrate of ego"), as "[developing] an analysis very close to the one I want to make." He then mentions Merleau-Ponty's *Phenomenology of Perception*[581] as marking the "natural prolongation of Husserl's thought" on habituality *via* experience as resulting in a kind of "intentionality incarnate," or what Bourdieu connects with "the habitus being that familiarity with the world of which Merleau-Ponty quite rightly said…is an intermediate term *between presence and absence*. This expression seems very apt to describe what I wanted to say, which is that the habitus is neither an ever-present consciousness constantly on the alert nor an absent automatism."[582]

Bourdieu suggests it is misleading to make the habitus substantive (equivalent to, say, a personality type), and certainly not deterministic, when, as this implies, it's very manner of *presence* is *probabilistic*. Habitus is neither a fixed "variable" nor a "feature" in this sense; but if it is not, this raises a question that is, very likely, *obvious* given the specific way in which (using variables) sociologists tend to use probability to generate predictive knowledge (e.g., statistical model-fitting). Specifically, if the classifications that sociologists are in the business of producing and using appear independently of the epistemic practices used to measure and define them, and if the presence of those classifications is probabilistic ("between presence and absence") rather than being substantive or static, how can they have any *predictive* value at all?

Bourdieu answers this question with a revealing statement in a section of the lecture aptly entitled "the solution of the habitus":

> [T]his is what I call *'the causality of the probable'* to borrow a term from Bachelard. This process of socialization, what Husserl calls experience, acquired through repeated confrontation with a social world structured according to a certain logic, a sort of disposition to anticipate and await what is going to happen, and moreover, to help make it happen by expecting it to happen—in fact, this *disposition to anticipate and await the probable*—is acquired through the permanent confrontation with a structured world defined by a certain structure of *objective probabilities.* I shall return to this when I come to discuss the field, for one might say that the *field is a space of objective probabilities* (of which is to say that, when you enter a space and go to a particular

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1960/1931), 66ff.

[581] Maurice Merleau-Ponty, *Phenomenology of Perception* (London: Routledge, 2002/1945). Merleau-Ponty's analysis of presence and absence clearly informs the expectations/Chance loop as Bourdieu develops this further from Weber. For Merleau-Ponty, "the 'sensible quality,' the spatial limits set to the precept, and even the presence or absence of a perception, are not *de facto* effects of the situation outside the organism but represent the way in which it meets stimulation and is related to it" (p. 86).

[582] Bourdieu, "Habitus and Field," 102.

> place, you have a 1 percent, 20 percent, or 50 percent chance of success).[583]

The two key concepts of *habitus* (mental structure/expectations) and *field* (social structure/chances, opportunities) therefore have mutually implicative definitions, and their mutual links come from their recasting in terms drawn ultimately from Weber's probabilism. Specifically, internalized probabilities can only exist if there are, in fact, objective probabilities in the world, and if fields are such localized distributions of objective probability. For Bourdieu, this insight is significant for the way in which objective probability is "translated into reality" as habitus. He describes this as follows as "the tendency of aspirations to adjust to objective opportunity."

> [T]he social agent who sets himself a goal of 10 and attains 2 tends gradually to move the desired goal of the performance nearer to the level of actual attainment: he chooses 8 and manages 4; he choses 6 and reaches 5; then he goes for 5 and gets 5. This kind of tendency to adjust aspiration to objective opportunity occurs quite unconsciously and without any need for the agent to intervene.[584]

This conveys a similar interaction with a space of objective probability, in this case through a "quasi-experimental" process involving "progressive disinvestment." Contrary to "reproductionist" readings of Bourdieu, nothing about this is deterministic; and this is not even the main point (though it is often made out to be by naive action theories).

What Bourdieu describes are interactions with a given space of objective probability, and its tests and risks, through which appears a distribution of aspirations. Those aspirations are ways of translating probability into reality, though not the only possible ways of doing so. If Bourdieu is to remain true to form and maintain sociology as *gnoseologica inferior*, even here, then he cannot fix the distribution in advance by any commitment to broad theories of reproduction or even insinuate how aspirations *should* be distributed. Both would simply affirm an authoritative division of mental labor.

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[583] Ibid, 123. The phrase "causality of the probable" comes from Bachelard's *The New Scientific Spirit* (New York: Continuum, 1934/1984). As we argued in the first chapter, from Bachelard's perspective, scientific explanation attempts, generally, to account for how a given phenomenon results from "translating probability into reality, or making the probable real." This "new scientific spirit" is a different approach to probability than taking a "given phenomenon and certain specifying parameters" and then "[predicting] that the probability that at some subsequent time the phenomena will be in such and state [sic], similarly defined by a specific set of parameters, is E" (120). Here, Bourdieu draws on Bachelard to mark the difference between an "ontological" view of probability (also held by Weber's main influence, Von Kries) and a purely epistemic one. For Bachelard, the indeterminist approach to probability "first entered physics" with the kinetic theory of gases and the probabilistic distribution of molecules for which it was not possible to increase the parameters enough to enable prediction "at a subsequent time."

[584] Bourdieu, *Habitus and Field*, 134.

Besides, he could not do this even if he wanted to because the source of aspiration remains *probabilistic*. If there are patterns in aspirations that do persist, this indicates a persistence in the mutually implicative counterpart to habitus; namely, objective probability localized in *fields*.

Field

For Bourdieu, the paternity of "field" to capture social space as objective probability derives from Marx, for the simple reason that Marx used a similar notion to confront the impulse to otherwise reduce all effects to social interactions: "In all forms of society there is one specific kind of production which predominates over the rest, whose relations thus assign rank and influence to the others. It is a particular ether which determines the specific gravity of every being which has materialized within it."[585] A wage-laborer, for instance, does not need to ever meet a majority stockholder to have her action impacted by objective probabilities that the relation (between "objective positions") creates. Bourdieu quotes this from Marx and then says, particularly about this latter part, "this is really the notion of the field."[586]

We might question whether this contradicts objective probability. Yet for Bourdieu, what Marx shows above all is how it is as a "space of objective relations irreducible to interactions" that can describe a field as a social space in which objective probabilities apply. The problem is that "objective relations" rather than "objective probability" has become the primary way to index the presence of a field. From a probabilistic (as distinguishable from a relational) perspective, positions are "objective" only because they each dictate the distribution of chances in each space of objective probability. This means that objective positions actually *exist* in the world because they form the basis through which participants in the field learn probability and form expectations.

It has gone largely unremarked upon that Bourdieu often contrasted fields with *apparatus*, as if a field could easily be mistaken for an apparatus, or a field could change into an apparatus and vice versa.[587] While they are different, a field and an apparatus seem to exist on the same plane or continuum. and Bourdieu does so too in the general sociology lectures. For Bourdieu, the notion of *apparatus* plays the role of a limiting (empirically unlikely) case: a completely non-probabilistic objective structure. It is in this way that apparatus contrasts to the fundamentally probabilistic notion of field. As Bourdieu explains, when an "integral monopoly is achieved…a field where for example the religious capital or legitimacy would be entirely concentrated in the hands of a single person or group of persons, would no longer be a field but, rather, what I would call an apparatus." This is a "completely mechanical [non-probabilistic] space answering to an almost physical analysis."[588] Thus, what happens in an apparatus is due to the *absence* of objective probability because it does not count on subjective assessments or internalized probability. This *is* a deterministic space, in other words, in which we cannot credit probability for anything, and participation can simply be assumed.

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[585] Karl Marx, *The Grundrisse* translated by Martin Nicolaus (New York: Penguin, 1993/1857-58), 106-07. Bourdieu adds: "Obviously I came across this text [Marx's Grundrisse] after a prolonged use of the notion of the field. (And I am surely the only person to have noticed [this passage quoted above], although heaven knows how many people have read Marx, or pretend to have read him!)."

[586] Bourdieu, *Habitus and Field,* 245.

[587] Pierre Bourdieu, "The Force of Law: Toward a Sociology of the Legal Field," *Hastings Law Journal* 38 (1986-87):

In the *Cours*, Bourdieu returns to a point he had first mentioned in *Outline* as differentiating between "capitalist" and "pre-capitalist" (or, we might say, non-capitalist) situations.[589] The presence of capital means that social order is reproduced in some relatively consistent way by an "objective mechanism" rather than having to be recreated, say, moment to moment, or interaction to interaction (e.g., Hobbesian free-for-all). Bourdieu here uses the example of Karl Polanyi's "self-regulating market" as an example of an "objective mechanism."[590] What we can infer from this is that a distinct space of objective probabilities forms based on certain *tests* (modes of *trying* concerning some form of potential resistance; these modes are "objective" because they resolve uncertainty within the space of the field) with accompanying *risks* (what one stands to lose should that uncertainty be resolved in a certain way). With *apparatus* there are limited tests and risks because there is limited uncertainty; the future appears as a predetermination rather than a potential or a probability. The lack of uncertainty also means there is no *illusio*, and therefore no presence of "buy in" or motivation necessary to engage. In *games of chance,* meanwhile, uncertainty prevails given the disallowance of anything that could

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814-855, see p. 818-19; Pierre Bourdieu, *Field of Cultural Production* (New York: Columbia University Press, 1993), 252-53; Pierre Bourdieu and Loic Wacquant, *An Invitation to Reflexive Sociology* (Chicago: University of Chicago Press, 1992), 102-03; see also Mustafa Emirbayer and Victoria Johnson, "Bourdieu and Organizational Analysis," *Theory and Society* 37, no. 1 (2008): 1-44, especially p. 6 n7.

[588] Bourdieu, *Habitus and Field*, 219.

[589] Pierre Bourdieu, *Sociologie générale - volume 2 Cours au collège de France (1983–1986)* (Paris: Le Seuil. 2019), 129-30; Pierre Bourdieu, *Outline of a Theory of Practice* (Cambridge: Cambridge University Press, 1977), 189.

[590] Pierre Bourdieu, *The Logic of Practice* (Stanford: Stanford University Press, 1990/1980), 130; Pierre Bourdieu, "The Specificity of the Scientific Field and the Social Conditions of the Progress of Reason," *Social Science Information* 14, no. 6 (1975): 19-47, see p. 32; Karl Polanyi, *The Great Transformation* (Boston: Beacon Press, 2001/1944), especially chap. 6.

objectively shape the tests that everyone confronts. There is no history in a game of chance, not least because our action does not matter for the outcomes.

In the *Cours,* Bourdieu refers to capital as distinct in this comparison of probabilistic and non-probabilistic social spaces, among other reasons because it "manipulates the propensity to invest" … "basically [manipulating] the *illusio*."[591] In both the *Cours* and *Meditations* he uses Franz Kafka's *The Trial* (and the fortunes of the character Josef K.) as an example.[592] In *Pascalian Mediations*, Bourdieu ties his claims more directly to the probabilistic propensities of *capital*.[593] In this instance, the stakes of "being *tried* by" a capital-leveraged field, and its objective probability, encourages a high investment; but this in turn discloses the sheer tenuousness (and risk) of what Bourdieu now refers to as the "justification for existing," and the fact that sheer pragmatic success is *less* at stake than is recognition (e.g., symbolic capital of being classified/recognized as such and such, with associated predictions). Thus, making things objectively probable also makes them more or less important (or worthy, capable of producing recognition) such that we invest in them. We *take an interest* in these things and, achieving them, are given a "reason for being"; but as Kafka shows, to dissect the process is to reveal its basic absurdity, making clear the mechanisms that "manipulate [our] propensity to invest" by conferring on things the propensities of capital.

Bourdieu's argument for the presence of fields rather than apparatus is not dissimilar, then, from Weber's argument for the presence of legitimate order.[594] Here action is "oriented by an actor's conception of the existence of a legitimate order" as dictated by specific ways of intervening into and molding the expression of *Chance.* An example would be the presence of an "office" separated from a household, decision-making according to "general rules," hierarchical order based on "career," with expertise established by tests, all of which are evident in bureaucracy as legitimate order.[595] Both Bourdieu and Weber used the conceptual resources of probabilism to define "macro" sociological concepts (e.g., the state) in a way that avoided the organicist reification of collectives or the postulation of collective persons and agencies. Bourdieu phrases this differently in his *Leçon Inaugurale* by removing Weber's implicit mentalism, but his concern is still with a field *qua* a "legitimate order" (in folk/mentalist terms).[596]

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[591] Bourdieu, *Sociologie générale*, 229 (our translation).

[592] Ibid, 178ff, 224. Franz Kafka, *The Trial* (New York: Schocken, 1999/1914).

[593] Pierre Bourdieu, *Pascalian Meditations*, (Stanford: Stanford University Press, 2001/1997), 237ff.

[594] Max Weber, *Economy and Society: A New Translation,* translated by Keith Tribe, (Cambridge: Harvard University Press, 2019/1921-22), 108-09.

[595] Max Weber, "Bureaucracy," in *From Max Weber*, translated and edited by Hans Gerth and C. Wright Mills (Oxford: Oxford University Press, 1947/1921-22), 196-245.

Capital

All this leads into Bourdieu's analysis of *capital* as arguably the specific term that has had the most mileage (which is saying a lot) in the triumvirate of capital, field and habitus, with various Bourdieusian and non-Bourdieusian "capitals" having proliferated in the sociological literature for the last forty years. Here too we can see how Bourdieu defined "capital" in terms of probability (as he did with habitus and field), and also the conceptual difference this makes. Despite arguments to the contrary, there is a Marxian lineage to capital in Bourdieu's work he remains faithful to, with him even suggesting that Marx's focus on capital accumulation is more *generalizable* than Marx made it.[597] In order for this to be the case requires that we recognize the *nearly inextricable connection between capital and objective probability*, or what is in many ways the opposite of the quasi-mechanical and apparatus-like focus that often tends to characterize the analysis of "Capital" (whether in an explicitly Marxian sense or not).

Bourdieu dedicates the last three years of his *Sociologie Générale* lectures (1983-84, 1984-85, 1985-86) to capital, but the general focus of his claims here is of a kind with the probabilistic characterization of habitus and field developed in his first two years of lectures. This becomes clear in the *résumé* that Bourdieu writes for the 1983-84 lectures, the first dedicated specifically to capital:

> Capital exists and functions only in relation to the field in which it can be classed: like trumps in a game, it confers power on this field, and in particular on materialized or incorporated instruments of production and reproduction, the distribution of which constitutes the very structure of a field, and on the regularities (mechanisms) and rules (institutions) that define usual operation of the field; and at the same time on the profits that are generated in this field (e.g., cultural capital and the laws transmission of cultural capital through the school system)...Games of chance, like roulette, give an idea of a universe of perfect equality of opportunity,

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[596] Pierre Bourdieu, "A Lecture on the Lecture," in *In Other Words* (Stanford: Stanford University Press, 1990/1982), 177-99.

[597] Bourdieu, *Habitus and Field*, 219; Mathieu Desan, "Bourdieu, Marx, and Capital: A Critique of the Extension Model," *Sociological Theory* 31, no. 4 (2013): 318-342.

> without accumulation, where anyone could win everything or lose everything at any time. Capital, as the capacity to produce profits and to reproduce, as identical or augmented, [creates] a tendency to persevere in one's being which means that everything is not equally possible or impossible at all, at each moment.[598]

The connection between capital and "games of chance" reaffirms the point developed in the previous years' lectures, particularly the *illusio* that defines participation in a field as similar to a *gamble*. But here Bourdieu makes the connection with objective probability that much more firmly because if the presence of a field is marked by capital, and this limits the "equality of opportunity" that can apply, then capital becomes fundamentally a measure of one's capacity to control the future of a particular objective probability. The roulette wheel stands out by contrast because it is characterized by a distinctively non-objective *Chancen* (e.g., every outcome is equally possible for everybody) in which nothing is allowed to control the future.

Objective positions, in this case, are essentially inherited strategies (e.g., "accumulated history") that have shaped objective probability in the past *because* of how they have differentiated themselves from already existing positions that had previously shaped what was objectively probable.[599] To shape what is objectively probable at a given moment, then, means to have "accumulated capital" because it makes your particular future chances more certain and less risky (e.g., "regular") than they would have been without this accumulation (never deterministic however). This formulation is fully relational because to shape objective probability in this manner reduces the "equality of opportunity" that, in an *absolute* sense could only prevail in social spaces that lack *any* objective probability, i.e. those (like "games of chance") in which, as Bourdieu puts it, "everything *is*...equally possible [and] impossible...at each moment (emphasis added)."[600]

When objective probability is shaped by the presence of capital, by contrast, this is reflected in internalized probability as the *illusio* that orients one's involvement in a field. This takes form in the sense of expectations and risk that varies according to one's alignment with or deviation from "positions" that are objective because of how they dictate available probabilities. When these positions are "institutionalized," a way of shaping objective probability is "made explicit, rationalized,

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[598] The original text of the résumés annuels for all of Pierre Bourdieu's lectures at the Collège is available here: https://www.college-de-france.fr/site/pierre-bourdieu/Resumes-annuels.htm

[599] Bourdieu, *Sociologie générale*, 32 (our translation).

[600] Ibid, 531.

[and] codified." This in turn shapes expectations and risk by making certain lines of action almost entirely predictable, while making any deviation a risky gamble. None of this requires a passage through intellectual cogitation or "mentalism" because expectations and sense of risk remain a *practical* sense as learned and internalized probability (e.g., habitus).

Thus, to maintain a highly capital-leveraged position means to act in ways that expand your influence over objective probability (e.g., to "accumulate") as to reshape and diminish *different* forms of what is objectively probable to make them align with yours. To act from a position that is not capital-leveraged (or not even a position in this sense) is to act in ways that *affirm* this sort of distinction (e.g., to "differentiate") as gaining control over the future by establishing objective probability in a form that does not mirror what has been accumulated as history or internalized as expectation. This is, distinctly in Bourdieu's view, what Marx gets right about the "structure of capital."[601] Importantly, a link can be forged here with Weber's "interpretive sociology," as Bourdieu senses because if capital shapes objective probability and expectations are linked to objective probability, then expectations that form relative to objective probability is "subjective meaning" rather than an interpretive scheme (like a cultural formation or folk psychology). Bourdieu is particularly clear on this as early as 1973:

> The habitus is the universalizing mediation which makes practices that have neither explicit reason nor significant intention "sensible", "reasonable" and objectively orchestrated: that part of practices which remains obscure in the eyes of their own producers is the aspect whereby they are objectively adjusted to the other practices and structures of which the principle of their own production is, itself, the product. In order to be finished with chit chat concerning the which constitutes the last resort of those who defend the rights of subjectivity against the "reductive" imperialism of the human sciences, we have only to recall that the decoding of the objective intention of practices and works has nothing to do with the "reproduction" (*Nachbildung,* as the early Dilthey put it) of subjective experiences and the reconstitution, useless and uncertain, of the personal singularities of an "intention" which did not actually generate them.[602]

This indicates that the relation of expectations and chances, which Bourdieu proposes here through an early iteration of habitus, is unavoidable because it can absorb uncertainty enough to act, whereas subjective meaning in the conventional sense might very well be present, but remains "useless and uncertain" for the specific fact that, without being understood as part of a loop, it will remains all too personal and singular, which is antithetical to social action.[603]

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[601] Bourdieu, *Habitus and Field*, 118.

[602] Pierre Bourdieu, "Three Forms of Theoretical Knowledge," *Social Science Information* 12, no. 1 (1973): 53-80, quotation is on p. 71.

On this specific point, and particularly, its extension to fields with capital and therefore unequal probabilities, Bourdieu is often reprimanded on this point for committing to a kind of poor man's game theory.[604] However, this criticism only sticks if Bourdieu's probabilism (in which expectations are linked to objective chances) is replaced by a folk rationalism (in which expectations are linked to an omniscient standard). Because a field is not a game of chance, participation can occur only according to the increase or diminishment of control (e.g., the *reduction* of absolute chance) over the prevailing objective probability as a way of grasping at and holding the future by ensuring one's repeat performance on tests. For Weber, a capitalist (in a strictly economic sense) only likes markets as spaces of objective probability up to the point that they have made their position reproducible.[605] A successful capitalist will seek to narrow those probabilities (e.g., making them less akin to a field and the opposite of a game of chance) as soon as possible. Both are ways of shaping objective probability.

As Bourdieu will argue later in the *Cours*, the presence of capital as historically established control over a space of objective probability allows for "the progress of Truth, or the progress of Reason…without even needing to want it explicitly."[606] In a 1975 article, Bourdieu mentions this as securing the "interest in truth" ("*intérêt a la vérité*") and how this rejects any claim for the exceptionalism of science as involving the "disinterested" pursuit of truth.[607] The accumulated capital of science, in this example, means that a space of objective probability has been established, secured (as "institutionalized," "embodied" and "objectified" capital) and can have a certain stability without the "arbitrariness" (e.g., capable of being remade at any moment as radically different) that would characterize a game of chance. This means that some statements and actions have a high probability of being considered "scientific" while others have little chance. By this stage, participants in the field have internalized this probability. At minimum, "new entrants" will tend to seek a "systematic diversion of ends" relative to the (currently) "dominant" through the (safer) accumulation or (riskier) distinction of capital to shape what is objectively probable such that it allows them to *exist* in the field.[608] In a field, they cannot do this through one-to-one interactions; though the fact that they can do this, and that there are established ways of doing this through which expectations can form, means that they *are* participating in a field rather than in an apparatus or playing a game of chance.

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[603] This language of resonates with Bourdieu's famous "Forms of Capital" essay (e.g., "institutionalized capital"), published originally in 1983 (translated to English in 1986), and reflected in the Capital *Cours* lectures, particularly the contrast between capital-laden fields, which have objective probabilities, and the non-objective probabilities of games of chance. Pierre Bourdieu, "Forms of Capital," Handbook *of Theory and Research for the Sociology of Education*, edited by John Richardson (Westport, CT: Greenwood, 1986/1983), 241-58; Pierre Bourdieu, *Forms of Capital: General Sociology, Volume 3, Lectures at the Collège de France 1983-84* (London: Polity, 2021/1983-84), 241-42.

[604] See Jeffrey Alexander, "The Reality of Reduction" in *Fin de Siecle Socal Theory* (London: Verso, 1995), 128-218.

[605] Weber, *Economy and Society*, 638.

[606] Bourdieu, *Sociologie générale*, 1112 (our translation).

[607] Bourdieu, "The Specificity of the Scientific Field," 31-32.

By "structure," then, we can translate different positions that are "objective" because they each dictate the distribution of chances in each space of objective probability. As lines of action, this takes systematic form as either "accumulation" or "distinction." To have an "interest" means to be willing to play a (capital-leveraged) game in which some chances are more likely than others to occur.[609] Depending on where one stands (according to a variety of metrics), this means one will "have an interest" in either accumulation or distinction, as broadly defined ways of *shaping objective probability* and the degree of *risk* one thereby assumes, such that your presence in the field can be part of other's expectations.

Illusio

Any reading of *Pascalian Meditations* will very likely miss its main and consistent themes without understanding that the book represents another entry (and, it turned out, the last one, with Bourdieu's death in January 2002) in a career-long effort to understand probability, its internalization, links to objective possibility, and its effect on action and experience. *Pascalian Meditations* is, in other words, an articulation of "general sociology," a further development of its basic categories (habitus, field, and capital) and an effort to articulate and extend further the distinct vocabulary (e.g., *conatus, nomos* and, especially, *illusio*) that puts objective probability, as an obscure and improbable concept which Bourdieu first stumbled upon over two decades earlier in reading Weber, and who himself retrieved it from Kries over fifty years before as part of Weber's own attempt to define sociology, right at the center of social explanation (see the discussion in Chapters 3-7).

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[608] Ibid, 32; Bourdieu, *Sociologie générale*, 232.

[609] Ibid, 201.

To "function," according to Bourdieu, a field must "find individuals who are socially predisposed to function as responsible agents." This is a rather odd phrasing to give (e.g., "*agent responsable*"), but it becomes much clearer, and more directly linked to probability, when Bourdieu notes "to risk their money, their time, and sometimes their honor or their life, to pursue the objectives and obtain the profits which the field offers…[This] basis of entry into the game and commitment to the game…[is] *illusio.*"[610] Thus, the "validity" of a field, in this case, depends on putting something up for risk according to probabilistic expectation. The term *illusio* here hints at this integral connection to probability. As Bourdieu acknowledges in *Pascalian Meditations* the term itself is derived from the classical probability theorist Christiaan Huygens' *lusiones* which specifically applied to "expectations" that correspond with *gambling* and what one will accept as a fair outcome (see the discussion in Chapter 3).[611] Essentially, your *lusiones* corresponds to your willingness to "play the game" or "stand trial" as evidenced by your having put forward something to lose (e.g., money, time, honor, even one's life).

Pascalian Meditations thus finds Bourdieu explicitly defining and elaborating the core *motivational* construct of general sociology, now with a firm probabilistic focus. Specifically, the notion of *illusio* (usually translated as "feel," "investment," or "interest" in the game) appears now as a core concept alongside habitus, capital, and field.[612] *Illusio* links to motivation via probabilistic expectation, but which is not necessarily conscious or personal. Those who are invested in a space of objective probability are interested in what its tests have to offer and are vulnerable to losing something. Those offerings come in the form of a distribution of chances: "the *illusio* (or interest in the game) is what gives 'sense' (both meaning and direction) to existence by leading one to invest in a game and its forth-coming [*son a venir*], in the *lusiones*, the chances, that it offers to those who are caught up in the game and who expect something from it."[613]

For Bourdieu, at the center of probabilistic sociology is the experience of *time*. Attunement to a rhythm of sequencing, particularly the *succession* defining a distribution of probabilistic outcomes in a field, orients experience within a sequence of trials. The experience of time is thus tantamount to a practical grasp of the *relation* between internalized probabilities (in *habitus*) generative of the dispositions and inclinations to act in this or that way given a present setting, and an objective succession, whether this be probabilistic (as in a field), random (as in a game of chance) or predetermined (as in an apparatus). The sense of temporality and (social) time arises in a field through this connection to a probabilistic succession:

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[610] Bourdieu, *Logic of Practice*, 194.

[611] See chapter 4 above. Bourdieu, *Pascalian Meditations*, 207.

[612] Bourdieu first appears to mention "illusio" only with the 1980 publication of *The Logic of Practice* (66-67, 82, 107). It is not found in the article with the same title in 1976, nor is it found in *Outline of a Theory of Practice* published in 1972. This suggests that a crucial part of revising the earlier text was integrating its core theme of practice with what Bourdieu (after 1973) had become increasingly preoccupied with as "objective probability." This combination required a new vocabulary, which (indicatively we claim) Bourdieu borrowed from classical probability theory.

[613] Bourdieu, *Pascalian Meditations*, 207.

> In the relationship between the practical expectations or hopes which are constitutive of an *illusio* as investment in a social game, and the tendencies immanent to this game, the probabilities of fulfillment that they offer to these expectations, or, more precisely, the structure of mathematical probabilities, *lusiones*, that is characteristic of the game in question.[614]

Because the experience of time tends to be a quasi-reflexive grasp of a (pre)intentional relation between internalized and objective probability, it follows that in cases in which there is an exact coincidence between expectations generated by the internalization of the probabilistic structure of the world and the set of objective chances provided by the field, time is not subjectively experienced. Instead, the phenomenological signature is that of being lost in the activities and offerings provided by the field (play, creation, or work) such that we "lose track of time." Instead, time intrudes precisely when there are (micro) breaks between anticipations and chances, such that "time…is really experienced only when the quasi-automatic coincidence between expectations and chances, *illusio* and *lusiones*, expectations and the world which is there to fulfill them is broken."[615]

What *Pascalian Meditations* consists of is a proposal for a probabilistic sociology, or a sociology in which basic concepts are defined in direct relation to probability because the phenomenon they refer to are probabilistic in nature.[616] Consider the following two examples: *motivation* and *power*. In this respect, fields are inherently productive of motivations (e.g., generative of 'impulsions" to do this or that, not just post hoc motivational talk) because the structure of possibilities they offer call forth, or evoke the required responses, but *only* from agents who have already internalized probability as *habitus* allowing them to anticipate (without this necessarily or even normally being a subject anticipation in the vein of rational action theory) the field's probabilistic offerings and be willing to lose something (e.g., make themselves vulnerable to the field) based on their assessment of chances within this particular structure of objective probability. It follows that the same set of chances would be grasped by someone who can practically wield the required set of subjective probabilities but missed by another who has not internalized the same set of objective chances. In this sense, what is to be done, or the things to do (or not to do) are also defined *relationally*, where the *relata* are once again, "the structure of the hopes or expectations constitutive of a habitus and the structure of *probabilities* which is constitutive of a social space." As a result, "objective probabilities are determinant only for an agent endowed with the sense of the game in the form of the capacity to anticipate the forth-coming of the game."[617]

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[614] Ibid, 208.

[615] Ibid, 208.

[616] This could account for the strange reputation and reception of the book in the subsequent two decades. In short, most analysts do not know how to fit it into Bourdieu's intellectual development, resorting to mostly speculative (and mutually inconsistent) takes. Accordingly, we find claims that it secretly contains a "theological unconscious" (Philip Gorski, "Just How Pascalian are the "Pascalian Meditations"? Critical Reflections on the Theological Unconscious of Bourdieusian Theory," *Sociology of Religion* 77, no. 3 (2013): 280-296), that it provides ample evidence of Bourdieu's adoption of the "logic of psychoanalysis" (George Steinmetz, "Bourdieu's Disavowal of Lacan: Psychoanalytic Theory and the Concepts of 'Habitus' and 'Symbolic Capital,'" *Constellations* 13, no. 4 (2006): 445-464), or that it offers a superb dismantling of "symbolic domination" particularly of the mystification of surplus extraction by capitalists during the labor

Rather than being a hindrance, the probabilistic structure of fields is what accounts for their motivational force or, in Gestalt-theoretic terms, "demand character." The most "de-motivational" environments, it follows, are ones that are perfectly predictable (where objective probabilities become *fate* in a substantive sense) *or* perfectly random (completely unpredictable). This is why the metaphors of "games" is an apt structural analogy in this case.[618] Probabilistic environments are "associated with uncertainty" but this is a "regulated uncertainty" which justifies "the pertinence of the analogy with games."[619] To motivate and call up action, fields have to be set up "between absolute necessity and absolute impossibility." People must feel like there are *stakes* for every action (some objective *chance* of winning or losing) and that the field has tests (requiring skill), in other words, rather than pure "rolls

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process (Michael Burawoy, "The Roots of Domination: Beyond Bourdieu and Gramsci," *Sociology* 46, no. 2 (2012): 187-206). These themes are all addressed but are of secondary importance to the larger project. The probabilistic hypothesis has the virtue of being the least speculative and is also the simplest. Bourdieu titled the book *Pascalian Meditations* because it was the last statement of his mature probabilism, and Pascal is the greatest French representative of classical probabilism (see the discussion in Chapters 1 and 3).

[617] Bourdieu, *Pascalian Meditations*, 211.

[618] Benjamin DiCicco-Bloom and David Gibson, "More than a Game: Sociological Theory from the Theories of Games," *Sociological Theory* 28, no. 3 (2010): 247-271. See also C. Thi Nguyen, *Games: Agency as Art* (Oxford: Oxford University Press, 2020).

[619] Bourdieu, *Pascalian Meditations*, 213.

of the dice" or strict rule-following (with no possibility of surprise).

Accordingly, the probabilistic structure of fields provides that "nothing must be absolutely sure, but not everything must be possible," which also makes them *learnable* and provides for the possibility of getting better at anticipating its offerings. Uncertainty, rather than being the enemy of action and motivation, is a primary enabler for both fields and games of chance, thus explaining why people are motivated to "work for the uncertain."[620] There is, however, a key difference between fields and games of chance. The latter are characterized by a "discontinuous series of perfectly independent events." In statistical terms, (fair) games respect the mathematical idea of "independence," in which the chances of success and failure in a successive state are not affected by the events immediately preceding. Fields, by contrast, have a *history* which makes the entire structure of probabilities offered by the field necessarily dependent on the preceding sequence of moves, countermoves, and the congealed history (sometimes encoded in material artifacts) constitutive of it. Fields are therefore *not* fair games; they are rather more like "a handicap race that has lasted for generations or games in which each player has the positive or negative score of all those who have preceded" them.[621]

Additionally, fields have conservative, self-preservative tendencies (what Bourdieu refers to as their *conatus*) to maintain a given "structure of objective probabilities, or, more precisely, the structure of the distribution of capital."[622] Accordingly, Bourdieu refers to the conservation of the structure of objective probabilities in fields across time as "the order of successions." This tendency, inherent to each field (and in fact constitutive of the field as such) ensures, "the regularities and rules of the transmission of powers and privileges which is the condition of the permanence of the social order as a regular distribution of *lusiones*, of probabilities or objective expectations."[623] In fact, Bourdieu sees *institutionalization*, in the sense of an objectification and sedimentation of roles and positions within fields (as elaborated first by Weber and then Schutz), as the primary mechanism underlying the tendencies of fields to reproduce (not necessarily exactly) a given structure of objective probabilities over time. To the degree that this objective structure of probabilities assumes an explicit and stated form (as *de facto* rules*,* law, "principles of vision and division"), it is retrievable as what Bourdieu now refers to as *nomos*.[624]

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[620] Ibid, 214; Bourdieu quoting Pascal in *Pensées*.

[621] Ibid, 215.

[622] Ibid, 215.

[623] Ibid.

Power

The recasting of his core concepts within this frame of sociological probabilism thus leads Bourdieu to a novel reconsideration of the idea of power. Here, power becomes inherently tied to the capacity to affect both the preservative and sometimes transformative tendencies of a field (its *conatus*) as encoded in the distribution of objective probabilities it offers. Thus, agents exert power when they can indirectly affect the subjective aspirations and expectations of other players by intervening in the *distribution* of chances offered in the field, "which are measured by objective probabilities." Power comes to be directly tied to issues of *predictability*, then, since a "predictable world…[is] one [that people] can count on, even in its risks."[625] Capital and power are also intrinsically related: "…power (that is capital, social energy) governs the potentialities objectively offered to each player, her possibilities and impossibilities."[626]

A person exercises power "over" others, then, when they control and manipulate the predictability of their actions, thus making it hard for others to predict: "[a]bsolute power is the power to make oneself unpredictable and deny other people any reasonable anticipation, to place them in total uncertainty by offering no scope to their capacity to predict."[627] As such, "[t]he power to act on time, through the power to modify the objective chances...makes possible (and probable) a strategic exercise of power based on the direct manipulation of aspirations."[628] People who make others wait (as in Kafka's parable "Before the Law" in *The Trial*), who set limits and quotas on expected durations, or who have the institutional capacity to shorten (or elongate) others' passage (or the time to the conferral of rights and duties via rites *of* institution) exercise power in its purest form. Interpersonal power (power over others) is operative when one actor can disrupt or subvert others' practical expectations and anticipations. This can happen either directly (e.g., via the creation of unpredictable or hard to predict situations) or indirectly, by modifying the objective structure of probabilities constitutive of a field, rendering it less navigable and predictable for those who lack power.

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[624] Ibid, 96ff.

[625] Ibid, 227-228. Bourdieu will develop this point further in *Homo Academicus* (Stanford: Stanford University Press, 1988/1984), which he had been working on in part since at least the May '68 revolts (see Loic Wacquant, "Sociology as Socioanalysis: Tales of "Homo Academicus," *Sociological Forum* 5, no. 4 (1990): 677-689) and which he published in 1984 (1988 trans), thus overlapping with the *Cours de Sociologie Générale*. Bourdieu (*Homo Academicus*, p. 87) mentions Leibniz's idea of the "order of succession" and applies it to the stages of the French professoriate in the social sciences and, particularly, philosophy/literature/history professors at the time (e.g. assistant lecturer – doctoral thesis – promotion to Lecturer – chair at the Sorbonne). As a prelude to the May '68 crisis, this order of succession was scrambled, which Bourdieu credits with being a critical ingredient of the "critical moment," combining with a different scrambling of an order of succession among students (p. 90ff). Bourdieu includes a revealing footnote to this discussion (p. 299 n19) in which he states the following, which connects "order of succession" to objective probabilities, and what happens when that order breaks:

> … the crisis in relations between the old and new entrants arises from a break in the harmony which used to obtain, for the great majority of new entrants, between the *personally internalized structures of expectation (waiting) and the objective structures (likely trajectories)*, a break which is influenced simultaneously by the effects of a transformation in the structure of probabilities of promotion and of a modification in the disposition of the agents. In such a conjuncture, the "old" and the "young" feel "out of phase," the former seeing careerist ambition in which is experienced as a normal claim, and the latter seeing mandarinal conservatism in what is felt to be an appeal for ethical standards (emphasis added).

[626] Bourdieu, *Pascalian Meditations*, 217.

The link between power, probability, expectation, and chance also becomes evident in the experiences and typical actions of those who have the *least* power, as in the least chance to shape their own or other's objective potentialities. For Bourdieu, the extreme powerlessness experienced by the most marginalized reveals what happens when the link between practical anticipation and a set of more or less coherent objective chances is almost completely broken.[629] In having a future denied via the denial of *any* set of objective chances in a field, individuals are rendered the most powerless. Without the capacity to link practical anticipations to a possible future, action itself becomes disorganized, "misfiring" in unpredictable ways and seemingly unmoored from "rational" (or more accurately *reasonable*) expectations. For Bourdieu, "below a certain threshold of objective chances, the strategic disposition itself, which presupposes practical reference to a forth-coming...cannot be constituted."[630] The ambition and motivation to control the future "varies with the real power to control that future," and that capacity is lacking among the most marginalized. This radical dislocation of expectations (which may show up in completely "unrealistic" fantasy) and chances is thus evidence of what happens when the anticipatory (and mutually adjusting) relationship between internalized probability and objective chance is broken, evident in the "projects they entertain, completely detached from the present."[631]

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[627] Ibid, 228.

[628] Ibid, 230.

[629] Bourdieu's example of the most marginalized are what he refers to as "subproletarians" (227). The example Bourdieu retains from the dispossessed Algerians he vividly describes in "The Disenchantment of the World," in *Algeria 1960* (Cambridge: Cambridge University Press, 1979/1963), 1-95.

[630] Bourdieu, *Pascalian Meditations*, 222.

The *attraction to games of chance* observed among the most economically dispossessed emerges as a mechanism to escape exposure to objective situations that offer *no chance*, which suggests that certainty of fate, as literally the *absence* of chance and uncertainty, is most aversive and demotivating.[632] These games, "offer an escape from the negated time of a life without justification or possible investment, by recreating the temporal vector and *reintroducing expectation*."[633] Attraction to risky ventures among young marginalized people (violence, dangerous games) has the same motivational basis, as it allows persons to escape from "fatalistic submission" to a world that offers no chances, thus allowing them to reclaim some level of control or power over the outcomes that *could* happen (which may include death). They can thus make "something happen rather than nothing." In this way,

> The extreme dispossession of the subproletarian…brings to light the self-evidence of the relationship between time and power, by showing that the practical relation to the forth-coming, in which the experience of time is generated, depends on power and the objective chances it opens…investment in the forth-coming of the game *presupposes a basic minimum of chances in the game*, and therefore power over the game, over the present of the game…the aptitude to adjust behaviour in *relation to the future is closely dependent on the effective chances of controlling the future*…inscribed in the present conditions…adaptation to the tacit demands of the economic cosmos is only accessible to those who possess a certain minimum of economic and cultural capital, that is, a certain degree of power over the mechanisms that have to be mastered.[634]

As Bourdieu notes here, the experience of time under "normal" circumstances (as a practical anticipation of an objective forth-coming), and investment in everyday practical activities (*illusio*) is intimately tied to power, and by implication the distribution of capital. Investment in a project or career, anything that involves the anticipation of the future, requires, at a minimum, a felt capacity to control the distribution of (anticipated) objective chances, themselves regulated via a chances-expectations loop. In this way, what seems to be a "conservative" adjustment to objective chances is itself the product of *power* as mediated by the aggregation of the action of others. Rather than being a limitation on "agency," power becomes the ability to seize, grasp, and "grab" that which *Chance* (in Weber's sense) has to offer.[635]

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[631] Bourdieu also quotes Pascal (New York: Penguin, 1995/1657-58, p. 42) again (it seems) to show the limits of calculation as learning against *illusio*, and to draw attention to the seeming low stakes investments made, that in fact are not low stakes when objective probability, qua (symbolic) capital, signifies importance and justification: "We are fools, powerless as we are, they will not aid us; we shall die alone. We should therefore act as if we were alone, and in that case should we build fine houses, etc? We should seek the truth without hesitation; and, if we refuse it, we show that we value the esteem of men more than the search for truth?" (Bourdieu, ibid, 239).

[632] Jens Beckert and Mark Lutter, "Why the Poor Play the Lottery: Sociological Approaches to Explaining Class-Based Lottery Play," *Sociology* 47, no. 6 (2013): 1152-1170. Jay Macleod documents a similar connection (e.g., between absence of chance as certainty of fate and "leveled aspirations") in his famous study *Ain't No Makin' It* (London: Routledge, 1995). Notably, he also observes the attraction of those "fated" to certain social futures to games of chance (see pp. 49-50, 183-184). See also Simon Charlesworth, *A Phenomenology of Working Class Experience* (Cambridge: Cambridge University Press, 2000), 122-23.

[633] Bourdieu, *Pascalian Meditations*, 222.

[634] Ibid, 223.

Probabilistic Sociology in the Bourdieusian Mold

Our argument has engaged in a mimetic retracing of Bourdieu's steps (from 1973 forward) as he engages in novel concept-formation to show the difference it makes, in this case for a well-known set of concepts, to draw them together with probabilism. By probabilism, we mean a scientific approach built on the premise that probability is *objective* as part of the world, involves learning by the folk without measurement or calculation, and has a direct (unmediated) connection to action and experience (see the discussion in Chapter 1). Probability can therefore serve as a point of mutual orientation between analysts and actors and, more generally, means that *all* sociologists should worry about and take account of probability, rather than just quantitative specialists or methodologists.

Given the (objective) improbability of making a contrary claim, and the expectations that have been adjusted as such, we believe requires (even to show the *possibility* of an alternative) a detailed tour of a sociologist's work that is distinctively probabilistic, but not as an epistemology or methodology. As we have argued, Bourdieu's sociological framework can be accurately recast as conceptually rooted in probabilism through and through. We have used this argument not as yet another exegesis on Bourdieu but with a more *mimetic* goal in mind. Retrieving Bourdieu's probabilism as part of his concept formation (both narratively and analytically) makes it possible to relay new schemes and practical approaches for a general incorporation of probabilism into sociology. Note that insofar as sociologists have already been making (perhaps good, perhaps ritualistic) use of Bourdieu's core concepts, then they are already probabilists in practice. So perhaps this transition may not entail such a radical subjective dislocation.

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[635] In what turned out to be his last *Cours*, Bourdieu applies this idea to the case of Édouard Manet, and how he orchestrated a "symbolic revolution" in painting during the second half of the 19th century: "when the field, understood as a space of positions, is perceived by a young man, a beginner endowed with a habitus of the 'we need a revolution, radical change, etc.' type, it appears, so to speak, as a space of possibilities, but not as a space of theoretical possibilities. In fact, if we use Max Weber's terminology, it is a space of objective possibilities, where there are things to do and things not to do. The things to do are not at all dependent on intentions." Pierre Bourdieu, *Manet: A Symbolic Revolution* (London: Polity, 2017/1998-2000), 48. Later in the *Cours*, Bourdieu will argue that Manet could be a "heresiarch" in painting, as one who shifts an entire field (and its objective possibilities), because, in part, he came from a position of affluence and stability (e.g., "had something to fall back on"), which was particularly significant at this time in painting: "This is significant, because this is a domain where new ideas were not commonplace, because you had to dare to put your insight into practice, which was difficult, and then of course you had to have the means to do so" (p. 228; emphasis added). The suggestion here is not that only those from a position of affluence and privilege can be "heresiarchs" (as Bourdieu himself proves), but that the vulnerability to a given space of objective probability is as such, for those who do not come from such a background, that they stand to lose everything should they make a similar "dare" and not succeed; though if they do succeed, they also stand to gain everything (elsewhere Bourdieu calls those in this position *oblates*: "those who give everything to the institution because they owe the institution everything"). The unstated (though strong) connection to Pascal here is readily evident.

Any such transition has three relevant points of conceptual focus, we believe, that are understandable in sequence, drawing from Bourdieu's novel concept formation. First, Bourdieu's early adoption of Weber took the form of a *looping relation*, between probability in two forms, which he would (over the course of the 1970s) articulate as habitus and field. Second, Bourdieu would use this probabilism to *reformulate the notion of objective structure* by introducing and revising concepts like capital as a way of explaining power, external force and action-at-a-distance (coming to fruition in the *Cours*) without holism or organicism (a goal he shared with Weber). Third, he would revise this probabilistic vision further (in *Pascalian Meditations*) to *theorize motivation* by deploying a new terminology (*illusio*, alongside *conatus* and *nomos*) that does not rigidly divide subjectivity from objective probability (e.g., fields).

As we have suggested, a probabilistic sociology in Bourdieu's mold would use these conceptual and meta-methodological arguments to propose and pursue significant changes to sociological practice. Theoretically, this opens new avenues and perhaps a probabilistic recasting of other core notions, of both Bourdieusian and non-Bourdieusian provenance. These include core notions in action theory, such as "belief," "trust," and even traditionally "macro" concepts such as "institution" and "structure," as we saw earlier. Take for instance, the idea of "hysteresis," featured prominently in Bourdieu's work.[636] This notion can naturally fit into the probabilistic framework, referring to instances of prediction-in-action from learned probabilities in previous experience that fail to match a novel configuration of objective chances offered by a dynamically changing environment What we have sketched here is merely the potential relevance of these general points by using Bourdieu’s probabilism as a demonstration (and far from the last word) of such concept formation.

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[636] Michael Strand and Omar Lizardo, "The Hysteresis Effect: Theorizing Mismatch in Action," *Journal for the Theory of Social Behaviour* 47, no. 2 (2017): 164-94.

Part III: Application

Introduction to Part III

The task we have pursued is to recover a tradition in probability theory, one that has notable proponents but still flies under the radar, and one that, as we have argued, is suitable and needed for the larger task at hand: to make the human sciences probabilistic, and specifically to give sociology another option in probabilism than data science. The goal now shifts. Given how objectively improbable this kind of position-taking is, how it defies the field-specific *nomos* and probabilistic expectation generally held among those particularly in anglophone sociology today, an open question about this pursuit remains whether following this position-taking and incorporating probabilism into sociological theory can really yield a *probabilistic sociology* and whether that makes any difference for empirical sociological research? Having done our best to acknowledge probabilism as a possibility, we will now attempt to inspire improvements to sociological research, rooted as it is in probabilistic knowledge, through exposure to a different, heterodox tradition. Now we will show what this means more specifically, drawing from probabilistic concepts we've mentioned so far, and, building on them, devising new strategies for applying probabilism to empirical questions and research designs.

Beyond the applications that we can find in Weber and Bourdieu, there is a contemporary scientific paradigm that also provides a host of probabilistic concepts and explanatory schemes. If, as mentioned above, a philosopher like Robert Nozick could look toward a future in which "artificial intelligence is philosophy," we draw from a robust conversation around "social theory as cognitive neuroscience" that moves in a diametrically opposed direction, not replacing human cognitive capacities with a technical apparatus but centering them and pushing them further into human-scientific analysis. There is a vanguard of probabilistic reasoning outside of data science. We can find it in the cognitive science paradigm known as *predictive processing*. There we can retrieve a kind of blueprint for a significant retooling and probabilistic reboot of social knowledge. This proceeds not in a minimizing and reductive sense but along firmly probabilistic lines, and more importantly along lines shared by the social science tradition of probabilism found in Weber and Bourdieu.

The following chapters focus on conceptual development and demonstration, rather than technical methods, to develop the probabilistic style of reasoning, which is not limited to a method.

For Hacking, style informs scientific arguments in a way independently of empirical facts, methods, or even key ideas. Styles do not rise or fall on the validity of a theory or hypothesis. Where we can see a style of reasoning most at work are in particular sentences. We have now seen many examples. A sentence like—"The height of this building is 150 feet"—is a style-*independent* sentence, while a sentence like—"As a consequence, [practices] tend, without any rational calculation or conscious estimation of the chances of success, to ensure immediate correspondence between the *a priori* or *ex ante* probability conferred on an event (whether or not accompanied by subjective experiences such as hopes, expectation, fears, etc.) and the *a posteriori* or *ex post* probability that can be established on the basis of past experience"—is very much style-*dependent.*[637]

So far, we have shown how the style of reasoning found in this sentence (its effort to capture a loop, its unusual use of probability, how it puts prediction into action) has gone largely unrecognized, and how this has fueled an incomprehension and frustration in misrecognition. To not see a style here is to easily see distracting wordplay and a willful lack of clarity. The same style found in Bourdieu here can be found in Weber and Du Bois (and in Charles Sanders Peirce, Nietzsche and, with surprising comparability, predictive processing); but far from this being a *mere* style, as this might connote, it has the same implications that all styles of reasoning do: demonstrating a more diffuse but nevertheless distinct means of "finding out 'that' so and so, but also finding 'how to.'" A style, most fundamentally, accounts for a novel way of "*finding out* in the sciences."[638] And, as we will now describe it, a probabilistic way of finding out affords a space for an interscience at the junction of cognition and action.

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[637] Pierre Bourdieu, *Logic of Practice* (Stanford: Stanford University Press, 1990/1980), 63.

[638] Ian Hacking, "'Language, Truth and Reason' 30 Years Later," *Studies in History and Philosophy of Science* 43, no. 4 (2012): 599-609, quotations are on p. 602.

Chapter 9 - Probability and Prediction in Cognition and Action

> *Dynamically speaking, the whole embodied, active system self-organizes around the organismically-computable quantity: "prediction error." This is what delivers that multi-level, multi-area grip on the evolving sensory barrage—a grip that must span multiple spatial and temporal scales … That grip, in the somewhat special case of the human mind, is further enriched and transformed by layer upon layer of sociocultural structures and practices. Steeped in such practices, our predictive brains are empowered to deploy their basic skills in new and transformative ways. Understanding the resulting interplay between culture, technology, action and cascading neural prediction is surely one of the major tasks confronting twenty-first century cognitive science.*
>
> ~ Andy Clark, *Surfing Uncertainty*

> *When people talk about the possibility of foreknowledge of the future, they always forget the fact of the prediction of one's own voluntary movements.*
>
> ~ Ludwig Wittgenstein, *Philosophical Investigations*

The sociology that comes to us from Weber and Bourdieu has, in many respects, more in common with early 20th century physics than it does with most sociology during the intervening period.[639] It showcases probabilism, and does so with a certain precision, which means that the kind of reasoning on display does not treat repetition as a metaphor; they take it literally. Furthermore, probability is, uncontroversially, a fundamental category for this sociology, though they do not take it in a metaphorical sense of the word; it, too, literally pertains to the world. The slew of other terminology, much of it famous and widely applied, demonstrates the incorporation of probabilistic reasoning into

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[639] See Gerhard Wagner, "Typicality and *minutis rectis* laws: From physics to sociology," *Journal for General Philosophy of Science* 51, no. 3 (2020): 447-458.

Weber and Bourdieu's sociology as a way of doing the unobvious task of *taking probability literally* while drawing probabilism into a style of argumentation and analysis. The principal proposition of a probabilistic sociology we stand to inherit from Weber and Bourdieu appears to be something like the following: *probability forms a true repetition in existence rather than an order of resemblance in thought (or method).*

But if this gives sociology a family resemblance with "statistical physics," the implications might go against the grain of the forward-looking and revisionary reading we have proposed.[640] To the contrary, by incorporating probabilistic reasoning into sociology, Weber and Bourdieu effectively *looped into* a universe of possibility that has now become the *avant-garde* of probabilism in the cognitive neurosciences: the predictive processing paradigm. Proposals for sociology to forge a relationship with cognitive science are long-standing by this point.[641] If the terminological, analytic, and conceptual shift required leads some to, perhaps understandably, resist the prospect of a "cognitive social science," an overlapping and shared probabilism provides a pre-established link between these two different communities of inquiry that might make a relationship more mutually palatable. In this chapter, we show that there is surprising commonality, on these terms, between probabilistic sociology and cognitive science in their mutual concern with action, looping effects, and institutional formation. To find and capitalize on this requires a transformation of the typical, frequentist understanding of probability in sociology by incorporating the heterodox tradition of probabilism we have documented so far and which centers action in probabilistic reasoning, just as predictive processing does.

There is much at stake: predictive processing forces cognitive scientists to recognize the outside-the-brain implications of sociocultural practices. Yet, as a sociological specialty, those practices appear to fly entirely under their radar, and so they are left to their own devices. Sociologists, meanwhile, often proclaim to be transdisciplinary but are, in practice, often walled in by avatars of other communities of inquiry, particularly those engaged in the study of cognition.[642] It is time to break these barriers. As we will see, a common ground in probabilistic reasoning helps us do that. In what follows, we specify these implications by fleshing out a link between prediction, action, and cognitive science.

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[640] Hubert Treiber, "Max Weber, Johannes von Kries and the kinetic theory of gases," *Max Weber Studies* 15, no. 1 (2015): 47-68; on this score, Steve Fuller remarks on the "exemplary seriousness with which Weber took the natural sciences of his day, not least their increasing embrace of *probabilistic reasoning*." Fuller, "Weber as a Swimmer in the Currents of his Time: An Object Lesson in how not to get Washed Away by the Tide," *Max Weber Studies* 20, no. 2 (2020), 225 (italics added).

[641] For two recent, summary proposals see Stephen Turner, *Cognitive Science and the Social: A Primer* (London: Routledge, 2018); Omar Lizardo, Brandon Sepulvado, Dustin Stoltz, and Marshall Taylor, "What Can Cognitive Neuroscience Do For Cultural Sociology?" *American Journal of Cultural Sociology* 8 (2020): 3-28.

Predictive Processing: Continuism, Helmholtz, and The Predictive Brain

Predictive processing (hereafter PP) marks a paradigm in cognitive science seeking to provide a unified theory of perception, cognition, and action. Given space limitations, our review is necessarily schematic and incomplete, as PP is now composed of sprawling literature ranging across several disciplines and disciplinary interfields.[643] The purpose here is twofold: First, to whet the sociological appetite with what we see as a promising unifying approach to accounting for the roots of such high-level phenomena as motivation, enculturation, and action at multiple time-scales.[644] Second, to show that PP, as it currently exists, presents a *prima facie* case that the approach to prediction and probability exemplified by probabilistic theorists in sociology, who take seriously both the probabilistic structure of the world and the internalization of probabilistic expectations, is not just a conceptual possibility, but one currently being realized across multiple research programs in the biological, cognitive, psychological and neurosciences. PP is distinctive for precisely *refusing* to make the distinctions that keep the door open to nominalism.

As a theoretical framework, PP proposes a set of unifying, or *continuist*, principles designed to describe brain structure and organismic action at multiple levels. Of most importance, for our purposes, is the fact that PP uses similar principles to describe the operation of *subpersonal* mechanisms involved at the level of the neuron *and* descriptions couched in *personal* terms, such as, for instance, the language of expectation, anticipation, and orientation, and even first-person reports on phenomenal experience.[645] The basic principles of PP not only cut across levels of analysis in terms of analyzing the behavior of people, but they are also applicable to both interpersonal and group-level phenomena, such as mind-reading, cooperation, and enculturation.[646] As such, PP is one of the few paradigms in the human sciences (writ large) to deal with the interface problem between what we will call personal and subpersonal explanation within an overall naturalistic framework.

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[642] Omar Lizardo, "Beyond the Comtean Schema: The Sociology of Culture and Cognition Versus Cognitive Social Science," *Sociological Forum* 29, no. 4 (2014): 983-989.

[643] Jacob Hohwy, "New Directions in Predictive Processing," *Mind & Language* 35, no. 2 (2020): 209-223. The broad range of ancillary fields in which PP finds influence is striking, including among them clinical psychology, psychiatry, addictionology, plant science, ergonomics, kinesiology, and even literature; see Karin Kukkonen, *Probability Designs: Literature and Predictive Processing* (Oxford: Oxford University Press, 2020).

[644] For general overviews of predictive processing with particular attention to its focus on a theory of action, see Andy Clark, *Surfing Uncertainty: Prediction, Action and the Embodied Mind* (Oxford: Oxford University Press, 2016); Alex James Miller Tate, "A Predictive Processing Theory of Motivation," *Synthese* 198 (2021): 4493-4521; Daniel Williams, "Predictive Processing and the Representation Wars," *Minds and Machines* 28, no. 1 (2018): 141-172.

Thus, PP focuses on the *relationship* between actors and structures of predictive orderliness, presenting a resolutely continuist position across levels, like the personal and the subpersonal, that are usually rendered apart in traditional action theory. For example, the business of incessant predicting is shared by the neuron and the entire organism alike. Our argument is that if sociologists were to draw from PP, then this would provide a conceptual means with which to avoid the division and bracketing evident in severing of probability and interpretation, specifically in a way that repositions sociology on the probabilistic claim that prediction matters because *actors* themselves predict as they adapt to the actually existing probabilities that make up the environments in which they act.[647] On this note, a larger point becomes visible to us should we peer into at least one of the recognized origins of PP.

For the German physiologist and physicist Hermann von Helmholtz, physiology could mark an attempt to use studies of the tissues of the body to provide answers for questions across the divide of natural (*Naturwissenschaften*) and human sciences (*Geisteswissenschaften*); but while this might suggest a fatal reductionism, in fact, Helmholtz did not envision a similar separation as necessary to preserve the cultural or "the human."[648] Even aesthetic responses to art and music were conducive to the "fully physiological human," as the core engagement with the aesthetic remained "perception itself or, even more fundamentally, *sensation*," which could only be "discovered and manufactured, altered and prolonged, regimented and liberated (all of these) in the context of a broad experimentalization of hearing."[649] Such an orientation is reflected in the unified approach of PP, which allows for inferences about neurons as much as addiction, cellular mitosis as much as linguistic meaning, neural nets as much as narrative symbolism.

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[645] Wanja Wiese and Thomas Metzinger, "Vanilla PP for Philosophers: A Primer on Predictive Processing" in *Philosophy and Predictive Processing,* edited by Thomas Metzinger and Wanja Wiese (Frankfurt am Main: MIND Group, 2017), 2.

[646] Andy Clark, "Radical Predictive Processing," *Southern Journal of Philosophy* 53, no. S1 (2015): 3-27; Regina Fabry, "Betwixt and Between: The Enculturated Predictive Processing Approach to Cognition," *Synthese* 6 (2018): 2483-2518; Samuel Veissièr, Axel Constant, Maxwell Ramstead, Karl Friston and Laurence Kirmayer, "Thinking through other minds: A variational approach to cognition and culture," *Behavioral and Brain Sciences* 43 (2020): 90-134.

[647] Pierre Bourdieu, *The Logic of Practice* (Stanford: Stanford University Press, 1990/1980), 63.

[648] In its devious (mis)alignment with *Bildung*, this may appear to pit Helmholtz squarely in a *methodenstreit*, as he makes a claim that does not appear to pay due diligence to the difference (or lack thereof) between knowledge of nature and knowledge of human beings and culture. However, Helmholtz's aspirations (at the time) did not align with what is more familiar in Anglophone contexts of this tension and the boundary-maintenance between the "two cultures." David Cahan, *Helmholtz: A Life in Science* (Chicago: University of Chicago Press, 2018), 246ff.

Helmholtz, for his part, differentiated his approach to optics from "projection theory," which finds perceptual objects as the product of "psychic processes" projected into space, and "intuition theory," which assumed "that certain perceptual images … would be produced directly by an innate mechanism."[650] Helmholtz's approach, by contrast, shows that "we are not simply passive to the impressions that are urged on us, but we *observe,* that is, we adjust our organs in those conditions that enable them to distinguish the impressions more adequately."[651] The nature of that adjustment is Helmholtz's concern. For instance, if we perceive an object (a bicycle) we are familiar with from a radically different angle—in the proverbial sense: upside down, looking between our legs—this physiological act of generation will be chased by recognition. We will be unsure what the object is and this "chasing" will seem like guessing. It takes a fraction of time, in this case, for recognition to happen; and when it does happen, the equivalent of "adjusting our organs" will *have* happened.

In such cases, there might be "more scope for interpretation," but even here, this involves the generation of sense-information until we are "obliged to assign [the object] to some definite place in space."[652] Should we recognize something apparently familiar (a bird), the generation of sense-information will chase it. This may prove the initial recognition wrong as we try to engage the percept as it stands (that "bird" is really a rock).[653]

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[649] Benjamin Steege, *Helmholtz and the Modern Listener* (Cambridge: Cambridge University Press, 2012), 15. See also Hermann von Helmholtz, *On the Sensations of Tone as a Physiological Basis for the Theory of Music* (Cambridge: Cambridge University press, 2009/1863).

[650] Hermann von Helmholtz, *Treatise on Physiological Optics, Volume Three: The Perceptions of Vision*, edited by James Southall (New York: The Optical Society of America, 1925/1867), 10.

[651] Ibid, 13.

[652] Ibid, 19.

[653] Thus Helmholtz arrives at a kind of pragmatism, but in a slightly different key than American pragmatism. "The tests," in his words, we employ to strengthen our "conviction of the correctness of the perceptions of our senses" must involve our "movements and actions." Perceptions can, then, only have a "practical truth" as dictated by their "orientation." Ibid, 22.

Physiologically understood, then, objects involve the generation and recognition as a two-part product. More specifically, each *chases* the other. The "mental process active in sense-perceptions" are top-down and synthesize present percepts by dictating how we "adjust our organs."[654] Thus, the sensible emerges as *sui generis* from these physiological adjustments and their "unconscious conclusions or inferences," which imply a "normal state" and training—how something should be sensed, rightside up rather than upside down—analogous to the role of expectation in the finite, "fully physiological human."[655]

While Helmholtz influence within various strains of psychology precedes this one, it was not until relatively recently that the core dynamic of his physiological and perceptual approach—namely, *recognition chasing generation* and vice versa—has been formalized both experimentally and conceptually. In one of the seminal publications of contemporary PP, Karl Friston and Klass Stephen argue that "if one formulates Helmholtz's ideas about perception in terms of modern-day theories one arrives at a model of perceptual inference and learning that can explain a remarkable range of neurobiological facts."[656] In particular, "inference" as Helmholtz understands it is combined with his later notion of "free energy" to yield the basic PP framework. In a technical sense, free energy stands as both non-kinetic and non-mechanical energy that is independent of heat or entropy in threatening the potential dissolution of a complex system. But it only has an *intensive* (rather than quantitative) meaning. In probabilistic language, free energy is "the difference between the probability distribution of environmental quantities that act on [a] system and an arbitrary distribution encoded by its configuration."[657] The two maintain a constant dynamic between generation (sense input) and recognition (predictive coding), or objective probability as a subjective probabilistic configuration (expectation).

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[654] Some of the implications have been hashed out as so-called "Helmholtz machines" or instruments of use in machine learning that leverage Helmholtz's approach to perception. It is possible to create "statistical inference [engines] whose function is to infer probable causes of sensory input. … [A] device of this kind can learn how to perform these inferences without requiring a teacher to label each sensory input vector with its underlying causes." See Peter Dayan, Geoffrey Hinton, Radford Neal and Richard Zemel, "The Helmholtz Machine," *Neural Computation* 7 (1995): 889-904, quotation is on p. 889.

[655] Helmholtz, *Treatise on Physiological Optics*, 9.

[656] Karl Friston and Klaas Stephen, "Free-Energy and the Brain," *Synthese* 159 (2007): 417-458, quotation is on p. 427.

[657] Karl Friston, James Kilner and Lee Harrison, "A Free Energy Principle for the Brain," *Journal of Physiology-Paris* 100, no. 1-3 (2006): 70-87, quotation is on p. 70.

The core insights of contemporary PP thus build on Helmholtz's foundation, but they push the two-part chasing or looping dynamic at its heart toward probabilism, introducing this as a missing ingredient to Helmholtz's compatible approach. The brain, its subpersonal components (e.g., brain networks, cortical and subcortical layers), the whole person, and perhaps, people in concert, are in one primary business, and that business is *prediction*. More specifically, across all levels of biological organization, prediction is the very "purpose" of the brain, or more accurately, brain structures have been evolutionarily selected to engage in prediction to facilitate organismic survival and genetic reproduction via the control of action.[658] In its essence, prediction is the best guess as to the causes of an incoming signal yielded by a pre-existing probabilistic *generative model*—itself the product of previous experience—which could be produced by the external environment (at the personal level) or by other brain structures (at the subpersonal level). The difference between model-generated expectation and what is experienced is the *prediction error*. The best and most effectively adapted generative model of the environment's probabilistic structure is the one that produces the smallest prediction error. Thus, the brain can be thought of as a dynamic system continually adjusting its generative models of the environment across multiple hierarchical levels and associated timescales so that they (in the medium and long run) *minimize* deviations from the prediction such models issue. The goal is always to minimize the difference between the generative model's expectations and the incoming signal or stimulation. This difference between predicted and "observed" is, as in standard linear regression models in the social sciences, referred to as "error." According to PP, our brain and body are fundamentally meant for *prediction error minimization* (PEM).

Importantly, the same error minimization principle holds across *all* levels of explanation, from the most elementary subpersonal structures to the acting person in a lifeworld, which means that brain networks, subcortical regions, and the body embedded in an environment are all engaged in PEM.[659] This is significant for sociologists who often deal with classes of individuals, but who cannot often justify the existence of these groups separate from their being a collection of data points. PP makes probability extend equally to "subpersonal" structures and people, as mutually active, pattern-maintaining, surprisal-reducing systems working together in tandem across timescales. Accordingly, from the PP perspective, prediction is an activity and a predicate applicable at multiple levels of biological organization, from neurons to neuronal populations, structural and functional brain networks, organisms, and even populations of agents. Thus, even if people do not predict following a normative statistical theory, they can be described as performing a type of subpersonal "predictive inference." Out of all the cognitive or mental predicates (e.g., perception, desire, belief, and the like), prediction is one of the few to have this "vertical cross-applicability" property in a way that goes beyond simile or the sort of category mistakes Wittgensteinian philosophers like to feast on (e.g., a neuron that "believes" or a brain that "sees"). At all levels, then, the brain traffics not in sensory information about the world around it, finding its purpose in processing that information to *represent* it; instead, the brain actively attempts to *anticipate* flows in the environment around it: "attempting to *guess* the present" in a manner akin to "adjustment" in Helmholtz's basic sense, to reduce the potential of free energy.[660]

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[658] Elliot Brown and Martin Brüne, "The role of prediction in social neuroscience," *Frontiers in Human Neuroscience* 6 (May 2012): 147.

[659] Elmarie Venter, "Toward an Embodied, Embedded Predictive Processing Account," *Frontiers in Psychology* 12 (2020): 543076.

Such a framework puts PP at the forefront of probabilistic reasoning in science because it demands that the objective world that our brains and bodies engage with be understood as *constituted* by probabilities. In the PP framework, "generative models" preserve the probabilistic structure of the world and preemptively send top-down signals that attempt to match the incoming bottom-up ones. At all subpersonal levels, from the neuron to the sense impression, what we find is an orchestrated attunement to a probabilistic environment aimed not at spectatorial "representation" but instead active *cancellation, reconciliation, resonance,* and *attunement* between the predictions generated by the internalized model and what is received from the level below.[661] Thus, generative models *cancel out* "raw" stimulation coming from the environment in the neural layers immediately coding for environmental contingencies.

The Principle of Active Inference

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[660] Andy Clark, "Busting Out: Predictive Brains, Embodied Minds, and the Puzzle of the Evidentiary Veil," *Nous* 51, no. 4 (2017): 727-753, quotation is on p. 727.

[661] This is called "hierarchical predictive coding" and has been shown to provide an empirically plausible model of the workings of the visual cortex, see Rajesh Rao and Dana Ballard, "Predictive Coding in the Visual Cortex: A Functional Interpretation of Some Extra-Classical Receptive-Field Effects," *Nature Neuroscience* 2 (1999): 79-87.

At the heart of the PP account's potential contribution to reframing social explanation, specifically along continuous lines, is what PP theorists call *active inference*. The basic idea is that, when faced with prediction error across multiple hierarchical levels, we (or subpersonal structures in us) have two choices to minimize the error: either reconfigure the probabilistic structure of the stored generative model and at the cost of discarding a profitable history of experience in the face of what could be merely temporary environmental disturbances, *or* engage in activities aimed at selectively sampling incoming sensory information that conforms with the hierarchically organized generative model. Some cognitive scientists refer to this as "revision-PEM" versus "action-PEM."[662] We prefer these terms, rather than something like "passive versus active" because among PP's breakthrough discoveries is that there is simply *no such thing* as passivity. Action is a *constant*. The only difference is whether we are actively coping with the world by canceling errors via an active updating of a generative model or self-fulfilling the selective sampling of the world that we receive as the sensory input that we can predict.[663]

Importantly, in a PP framework not all discrepancies (prediction errors) between generated likelihoods and experience are created equal. At both personal and subpersonal levels, prediction errors are inconsistent and less structured than those in which the variance is large. They are more often discounted and are less likely to generate model updates or motivate us to engage in active inference to cancel them out. Instead, it is repetitive, consistent errors, or error signals with low variance from what is expected, that are most likely to attract attention and motivate action to cancel them out. This tendency is what gives action its predictable and "regular" character.[664]

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[662] Jona Vance, "Action Prevents Error: Predictive Processing without Active Inference" in *Philosophy and Predictive Processing*, edited by Thomas Metzinger and Wanja Wiese (Frankfurt am Main: MIND Group, 2017).

[663] We also add the caveat that revision- and action-PEM represent "ideal-typical" ends of an action continuum, and not antithetical "types" of activity, as has been the classificatory penchant of standard action theory. Even the most mundane act of perception, cognition, or action leads to some updating of the overall generative world model (at some level of the hierarchy) and is, at the same time, an act geared toward self-fulfilling expectations of future experience derived from the same distributed model by engaging in the requisite experience-sampling activity.

[664] PP theorists refer to this as the principle of "precision weighted prediction error minimization" (Clark, *Surfing Uncertainty,* chap. 2). More "precise" (lower variance) errors are the ones most likely to jump to the top of the list to be dealt with. They are also more likely to be allowed to change the underlying probabilistic structure of the internalized generative model if the error cannot be canceled via selective resampling of the world (active inference). At the other end of the spectrum, attention is a type of active inference induced by experiences made "attention-worthy" because they generate highly weighted, precise, and difficult to dismiss errors. This is a key distinction introduced by PP-based therapies for addiction or obsessive-compulsive disorder, relative to cognitive-behavioral or psychodynamic therapeutics; see Mark Miller, Julian Kiverstein and Erik Rietveld, "Embodying Addiction: A Predictive Processing Account," *Brain and Cognition* 138 (2020): 105495.

Thus, to put the principle of active inference in a manner that can be transposed directly into what probabilistic reasoning can mean for sociological explanation: *we attend only to that which we cannot consistently predict*. Because prediction is in the service of non-perception or canceling prediction error as we engage with the surrounding objective probabilities, and action is also in the service of assimilating experience to extant models, attention is necessarily a scarce resource to be mobilized only in the face of recalcitrant, precise, and insistent error. Hence, only when faced with reliable, stubborn evidence that extant generative models are not up to the predictive task does a "percept" become explicit and information-bearing, even if a generative model can *never* adapt to the probability that it will appear again in the active inferential loop.[665] In line with this loop, the PP framework more generally rests on a basic two-step process like Helmholtz's recognition/generation dynamic. The environment's probabilistic structure is encoded by persons in the form of generative models. People then use, and fine-tune, those models to cancel the error produced as the ("free energy") difference between the model's predictions and the information provided by dynamically evolving experiential manifolds. In this way, PP breaks with passive conceptions of the link between perception, cognition, and action, in which we only have a one-directional arrow *from* environmental stimuli *to* cognitive representation, and then to action control.[7] Rather, since action is constant, it is involved in the generation, adaptation and implementation of generative models to *guess* probabilistic environments.[666]

The idea that perception is not purely bottom-up (or stimulus-driven) but instead subject to "top-down" influences based on attention, selection, and construal of stored constructs is not new or particularly groundbreaking. Neither is the idea of top-down influences on perception new to culture and cognition scholars in sociology. The "filtering" of perceptual streams by larger cultural schemas and categories is a fundamental premise emanating from the "sociological Kantianism" that animates the field.[667] The radical difference presented by PP is that organisms cope with the environment by *anticipating* it rather than representing it. Actors use generative models produced by experience to encode the probabilistic texture of previous states of the environment. It is in this respect that "predictive processing *inverts* conventional assumptions about the flow of information in the brain."[668] For PP, then, prediction is an *incessant* and *constitutive* feature of all action and cognition. Or, more simply: there is *no perception without prediction* and there is *no prediction without action*.

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[665] Note that the sociological notion of "hysteresis" can thus easily be conceptualized in terms of PP, as a recalcitrance against updating internalized generative models of the environment produced by consistent experience in the face of disconfirmation (high precision-weighted prediction error) by novel environmental circumstance that cannot be accommodated by the probabilistic structure of the current model. The prediction is that agents will try to use active inference to attempt to subsume the novel experiential set into the previous model (cancel the error), but this will show up at the personal and institutional level as a form of "hysteresis" where old practices will seem to misfire (failed active inference), see Michael Strand and Omar Lizardo, "The Hysteresis Effect: Theorizing Mismatch in Action," *Journal for the Theory of Social Behaviour* 47, no. 2 (2017): 164-94.

[666] Williams, "Predictive Processing and the Representation Wars."

Recovering Probabilistic Sociology via Predictive Processing

We have concentrated on this extended discussion of predictive processing to establish what it means to engage in probabilistic reasoning and to show how prediction can play a substantial role in scientific explanation differently from present approaches found in sociology and data science. We can see probabilistic reasoning means many things: first, the objective structure of the world is probabilistic, constituted by probabilities, rather than probabilities being epistemic statements *about* the world. Second, there are no probabilistic techniques like prediction that are only accessible to analysts, instead anything that engages with a probabilistic world through action also has access to them, only the form differs;[669] and third, action becomes a primary venue of empirical investigation and general theory because action is defined as engagement with the probabilistic world.

While the previous story was told at the subpersonal level of brain networks and cortical and subcortical structures (all of which seem to be arranged in the hierarchical manner predicted by the PP story), the *same account* transfers to the personal level that sociologists are concerned with, involving believing and desiring actors, social identity, and social structure, and forms social order and social change that fuel the sociological imagination. There is continuity between the subpersonal and the personal, with both accounts comingling in action explanation.[670] On this basis, then, prediction in the

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[667] Eviatar Zerubavel, *Social Mindscapes: An Invitation to Cognitive Sociology* (Cambridge: Harvard University Press, 1999). This is the approach that has been taken to task by John Levi Martin (*Explanation of Social Action,* 112ff) as the "grid of perception" argument.

[668] Joe Dewhurst, "Folk Psychology and the Bayesian Brain," in *Philosophy and Predictive Processing*, edited by Thomas Metzinger and Wanja Wiese (Frankfurt am Main: MIND Group, 2017), 1.

[669] This includes plant life, see Paco Calvo and Karl Friston, "Practicing Green: Really Radical (Plant) Predictive Processing," *Journal of the Royal Society Interface* 14, no. 131 (2017): 20170096.

[670] Bermudez, "Personal and sub-personal; A difference without a distinction."

PP framework provides a way to translate between levels of inquiry into a sociologically substantive form. At the level of action, perception, and cognition, people are not in the business of passive environmental representation but of using generative models of the probabilistic structure of environmental contingencies to minimize the expectations generated from these models as they attempt to guess the causes of current perceptions and feelings. Contrary to, say, a world of "senseless experiences" that demand interpretation, and which sometimes uses the language of "models" (models of and models for),[671] people do not use these models to create spectatorial ("imaginal") scenes of an inherently opaque environmental sensorium that needs to be meaningfully depicted in its entirety to be meaningful at all. Instead, their previous history of acculturation, modification, and attunement to a probabilistic landscape means that actors are in the business of trying to get a handle on the probabilities that comprise their environment by canceling out unexpected stimulation through the formation of generative models and active inference.

We can put this more simply as follows: people do not interpret or represent so that they might occupy a meaningful world. They predict with the hopes that, eventually, they might *not* have to see, hear, smell, or feel that world (which remains an unobtainable goal).[672] Prediction reduces uncertainty, just as meaning-making does. A probabilistic sociological imagination will focus on the means of prediction deployed in action to understand the probabilities that comprise the social world, how people learn and are oriented to those probabilities, and how prediction-in-action maintains or changes them.

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[671] Clifford Geertz, *Interpretation of Cultures* (New York: Basic Books, 1973, 214ff). Despite the broad familiarity of Geertz's "model of, model for" proposal, it is seldom acknowledged that he derives this from mid-century cognitive science, specifically Eugene Galantar and Murray Gestenhaber's proposals in their 1956 paper "On Thought: The Extrinsic Theory." Most noteworthy about their proposal is its evident probabilism: "The phrase 'required to think' will be used of a motivated organism whenever it faces an environment that is able to yield some reward or value. Presumably the organism does not know the sequence of actions required in order to achieve the reward. The environment will be called a 'machine' or 'mechanism.' Thus we say that an organism is faced with a problem if it is motivated to *predict the behavior* of the machine. The process by which the behavior of the mechanism is predicted is called 'thinking,' and adequate (in the sense of achieving the reward) prediction is called a 'solution.' … Once a model has been constructed, it can be manipulated under various hypothetical conditions and constraints … If the image mirrors the relevant aspects of the environment, prediction is possible … We have suggested that thought consists in modeling the environment and using the model to predict the future state of the world." See Eugene Galantar and Murray Gerstenhaber, "On Thought: The Extrinsic Theory," *Psychological Review* 63, no. 4 (1956): 218-227, quotations are on p. 219, 226. For Geertz, what Galantar and Gerstenhaber propose is condensed into "a matching of the states and processes of symbolic models against the states and processes of the wider world," yet this appears inconsistent with other parameters of his focus on interpretation, which implies less two-way "matching" than one-way symbolic construction or formation.

[672] The "self-tickling" problem is an apt demonstration of these principles. Why is it that others can tickle us, and this is immediately perceived, but when we try to tickle ourselves, we usually fail? While other accounts have trouble with this issue, the PP account handles it elegantly. When other people tickle us, the prediction problem, given our incomplete generative model of their action, is substantial. The tickling sensations are the endpoint of numerous prediction errors across multiple layers of neuronal organization. Hence, we perceive what we cannot predict, and are sometimes amused or annoyed at the tickling. In the case of self-tickling, on the other hand, prediction is simply par for the course. In subpersonal terms: the generation of an action (such as moving the hands during tickling) requires the generation of an "efference" copy of the motor command that is then used to predict our motor activity (via top-down predictive coding) to facilitate action control. Put in personal terms: when trying to tickle ourselves, we know what is coming and, therefore, do

While this demonstration of probabilistic reasoning might seem unusual, we have seen in previous chapters how our probabilistic sociological precursors arrived at similar points as those we now retrieve from predictive processing. The principle of active inference proposes a duality between the structure of probabilities represented by past environmental contingencies and trajectories and the structure of predicted probabilities produced by the internalized generative models, in a way that provides a *precise analog* to what Weber and Bourdieu propose as a looping relation between "chances and expectations" in accordance with objective probability.[11] Similarly, the brain's main task is to use hard-won generative models acquired from experience to generate contemporaneous predictions as to the most likely causes of experience.

For the probabilistic sociologist, likewise, persons are innately "open to the world."[673] This openness goes beyond the "narrow bandwidth" version of traditional socialization theory, in which only high-level constructs couched in the personal language of beliefs, attitudes, or "values," are allowed to durably modify people.[674] If the predictive processing story is on the right track, then persons are open to the *entire manifold of statistical regularities* in the physical, social, cultural, and psychological environments they occupy, across multiple hierarchical and temporal levels, from the perception and recording of the most minute "micro-features" of experience to the more spatially and temporally extended "features" of the social environment.[675]

More specifically, a probabilistic sociology will infer that for every synchronic or diachronic regularity we might observe in the social world—every A preceding B, X "going with" Y, or P following Q—there is a predictive *hypothesis*: $P(B|A) > \{P(B|C), P(B|D)\ldots\}$. As PP conclusively demonstrates, this internalization is hardly a passive process, which we can summarize with an additional principle:

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not perceive it in the same way. The task of minimizing the prediction error by incoming stimulation via hierarchical predictive coding is easier than when others try to tickle us.

[673] Pierre Bourdieu, *Pascalian Meditations* (Stanford: Stanford University Press, 2000/1997), 134.

[674] Omar Lizardo and Michael Strand, "Skills, Tools, Contexts and Institutions: Clarifying the Relationship Between Different Approaches to Cognition in Cultural Sociology," *Poetics* 38, no. 2 (2010): 205-228.

[675] Jose Bermudez, "The Bodily Self, Commonsense Psychology and the Springs of Action," in *The Bodily Self: Selected Essays in Self-Consciousness* (Cambridge: MIT Press, 2018), 267ff.

internalization is for prediction, and *prediction is for action*.[676] The "recording" of an association between A and B via learning becomes a *resource* to predict B using A. Accordingly, even at the earliest stages of such "internalization," which, at the subpersonal level, consists of the tuning, strengthening and weakening of direct synaptic connections and indirect temporal coordination of spiking activity in neuronal populations, people begin to use their incipient "hypotheses" to generate top-down anticipations as to what the environment will bring next.[677] So at the sight (or the hearing, touch, smell) of A we predict B, when we experience X we anticipate (and prepare ourselves for) Y, when we believe we are in the presence of Q, we immediately expect P to come next. Possessing a myriad upon myriad of such "hypotheses" at multiple levels of organization in the social environment and at multiple time scales of historical changes in the same environment, we can define social order as *orders of succession* (Bourdieu) and as *Chance* (Weber) often-used term, or more generally as historically emergent "pockets of predictability" in which probabilistic expectation can form.[678]

The most significant theoretical implication this has for sociology is for the kind of vocabulary that we use to understand action, and, more typically, how we use action in sociological analysis. Including action in sociological explanation has often been seen as an antidote to nominalistic thinking.[679] Thus, the post-functionalist assault against the remnants of Parsons has been mainly conducted by emphasizing continuity in one form or another, whether as the "temporal flow" of action, between "analytic" dimensions, such as "interpretation" versus "strategy,"[680] across temporally specified phases or elements, such as iteration, versus projection, versus practical evaluation,[681] or continuity across the "elements" of the action scheme itself, such as means and ends,[682] modes of action like creativity and habit,[683] or effort versus moodiness.[684] However, such non-probabilistic approaches to action, as severed from prediction in all these examples, requires that we define and name "action" in ways that violate what a probabilistic approach to action like PP emphasizes as both *vertical* and *horizontal* continuity.[13]

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[676] Moshe Bar, "The Proactive Brain: Using Analogies and Associations to Generate Predictions," *Trends in Cognitive Science* 11, no. 7 (2007): 280-289.

[677] In the unpublished "Steps Toward a Science of How Men Act," W.E.B. Du Bois emphasizes this basic idea, drawing attention to the formation of hypotheses in action as being the source of emotional valences and the most integral component of the forward momentum of action in what we have called a horizontal sense: "The doubt, the paradox of the possibility of knowledge beyond your own feeling and thought, remains forever. Everything may be a fantastic mirage, beyond what we now feel. But the very statement of this is contradictory, since I must assume that you exist; and whatever your emotion is, you assume that I also feel; and our assumption in the main work, they click, they correspond with our thinking. It is possible to go so far in this search for reality that language that tool of thought [sic], fails us; its words lose and shift meaning and we fail in logic and precision. Here the great scientific tool of the Hypothesis is discovered; we assume that certain things are true; we act as though this assumption is Truth. The ensuing facts of our experience arrange themselves in accord with our assumption" (pp. 3-4) W.E.B. Du Bois, "Steps toward a Science of How Men Act." W. E. B. Du Bois Papers, MS 312. (Special Collections and University Archives, University of Massachusetts Amherst Libraries, c. 1946), quotation is on p. 3-4. We return to Du Bois' probabilistic claims in more detail below.

[678] Lorraine Daston, *Rules: A Short History of What We Live By* (Princeton: Princeton University Press, 2022), 273.

[679] Neil Gross, "A Pragmatist Theory of Social Mechanisms," *American Sociological Review* 74, no. 3 (2009): 358-379; Hans Joas, *The Creativity of Action* (Chicago: University of Chicago Press, 1996).

[680] Jeffrey Alexander, *Action and Its Environments: Toward a New Synthesis* (New York: Columbia University Press, 1988), 312ff.

Sense and Segmentation: Horizontal and Vertical Crossings

Continuism, as we have proposed it, revolves around questions familiar to those asked by Weber. Is, for example, accounting for the physical vibrations of eardrums adequate for grasping musical tonality, as Helmholtz once argued?[685] Today, we would be hard-pressed to deny that he had a point. Yet, "the physicality of the tone" is typically segmented from what is otherwise judged to be adequate for explaining why music sounds the way that it does. Rules of tonality, musical genres, or ethnomusical conventions are the non-chance related causes taken as adequate to explain the sound in question. While they certainly depend on tonal physiology, they essentially render it a matter of chance. Though it might be physically necessary, it is fully contingent from the perspective of what really constitutes the objective potential of "music."

Continuism often broaches this question because it pushes the boundary between what we will call "personal explanation" versus "subpersonal explanation."[686] For Helmholtz, it was not a question of whether rules of tonality had a physiology; *physiology* is fundamentally what those rules *are*. But how can we make such a claim without being reductionist? Continuism is a *mode of*

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[681] Mustafa Emirbayer and Ann Mische, "What is Agency?" *American Journal of Sociology* 103, no. 4 (1998): 962-1023; Iddo Tavory and Nina Eliasoph, "Coordinating Futures: Toward a Theory of Anticipation," *American Journal of Sociology* 118, no. 4 (2013): 908-942.

[682] Josh Whitford, "Pragmatism and the Untenable Dualism of Ends and Means: Why Rational Choice Theory Does Not Deserve Paradigmatic Privilege," *Theory and Society* 31 (2002): 325-363.

[683] Benjamin Dalton, "Creativity, Habit and the Social Products of Creative Action: Revising Joas, Incorporating Bourdieu," *Sociological Theory* 22, no. 4 (2004): 603-622.

[684] Daniel Silver, "The Moodiness of Action," *Sociological Theory* 29, no. 3 (2011): 199-222.

[685] Helmholtz, *On the Sensations of Tone as a Physiological Basis for the Theory of Music*.

[686] For a discussion of the distinction between horizontal and vertical explanations of action and the non-substantiality of the personal/subpersonal distinction, see José Luis Bermúdez, "Personal and subpersonal: A difference without a distinction," *Philosophical Explorations* 3, no. 1 (2000): 63-82.

explanatory extension that tries to do without segments that allow for such proclamations of reductionism. It tries to use the same language to explain what is small as it does to explain what is large, even while appreciating their differences. So rather than segment tonality from physiology, and thus create explanatory pitfalls of one form or another, it instead asks what do physiology and tonality both do? For PP, what they both do is resolve prediction error, as the fundamental recipe for any kind of ordered pattern, whether as rules or physical vibrations.

From a continuist perspective, and the basic ordering principle of probabilism, that which distinguishes adequacy from chance relations, and which revolves around taming chance (or in PP terms, reducing prediction error, making the generation of information by action be followed by its recognition with minimal free energy), is essentially segment-less. A segment indicates unresolved (and perhaps unresolvable) prediction error if it is not to be perfectly arbitrary, and the forms into which what we might otherwise call unknowable "singularities" are cast become our knowledge, indicating its deeply probabilistic roots. This taming of chance can be tracked both vertically and horizontally, at subpersonal (physiology) as well as personally accessible levels (rules of tonality). For a field like sociology, the questions posed by continuism are particularly pressing, because it routinely engages across levels, begging significant questions of what is adequate and what is chance. Importantly, sociology tells us (perhaps like no other discipline does) that "subpersonal" does not mean "small" or "micro."

Interpretive explanations of action in sociology make recourse to an exclusive and, for some scholars, irreducible, indispensable, and irreplaceable *personal* vocabulary, specifically the autonomy of personal explanation. This is a point on which, and perhaps surprisingly, sociologists who support the use of action theory and sociologists who do not actually agree.[687] In explaining why people do the things they do, sociologists often point to the interplay of people's intentions, desires, goals, beliefs, and plans.[688] Explanations using such hallowed constructs as "norms" or "values" are equally reliant on the same personal vocabulary since these terms, when put into action, must be translated into some variation of a belief and desire combination.[689] For instance, values are typically defined as *conceptions* of the *desirable*—and thus as ways of having everyone strive for the right things[690]—and norms as *beliefs* about what is more appropriate to do in a given situation, or beliefs about others' beliefs.[691] Once we have values, desires and beliefs, about norms, constraints, and the like, all we need to add is the *oomph* of intention or "effort" to generate action.[692] Even further, when tying action explanations to certain normative ideal types dictating how people *should* behave, such as the norm of rationality, a case can be made that the personal vocabulary *suffices* for all explanations of action even when it deviates from the ideal-typical normative case.

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[687] This becomes particularly apparent when the ideas of Donald Davidson, the classic philosopher of action, are brought into the conversation. See, for instance, Isaac Reed, *Interpretation and Social Knowledge* (Chicago: University of Chicago Press, 2011), 135-36; Duncan Watts, "Common Sense and Sociological Explanation," *American Journal of Sociology* 120, no. 2 (2014): 313-351; especially p. 319; Peter Hedstrom, *Dissecting the Social: On the Principles of Analytical Sociology* (Cambridge: Cambridge University Press, 2004), 38ff. See also Donald Davidson, "Actions, Reasons and Causes," *Journal of Philosophy* 60, no. 23 (1963): 685-700.

[688] Stephen Vaisey and Lauren Valentino, "Culture and Choice: Toward Integrating Cultural Sociology With the Judgment and Decision Making Sciences," *Poetics* 68 (2018): 131-143.

A case can therefore be made that to introduce any sub-personal explanatory construct, especially one harking back to "psychological" (today neurophysiological) or an otherwise non-meaningful (in this autonomous sense) mechanical cause of action, is illicit. Worse, the use of such "subpersonal" constructs in explaining action is a category mistake since action is that which is explained by the causal interplay of personal states such as intentions.[693] Such arguments can be convincing in part because one of the strongest warrants for the pervasive use of the personal vocabulary to explain action is that it has the seemingly incontrovertible advantage of being subjectively meaningful.[694] People can report the values they hold, the beliefs they are committed to, and the goals they hope to accomplish. These reports can be used to verify whether any analyst-imputed goals, beliefs, and desires have subjective validity.[695] Using a personal vocabulary as an explanation of action by the sociological analyst in the technical sense of explaining and "elucidating the causes of *x*" where *x* is a course of action can seem like a move toward continuity (as "charitability") because this vocabulary happens to be *the very same vocabulary* mobilized by the laity when they

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[689] Hedstrom, *Dissecting the Social*.

[690] John Levi Martin and Alessanda Lembo, "On the Other Side of Values," *American Journal of Sociology* 126, no. 1 (2020): 52-98.

[691] Jens Rydgren, "Beliefs" in *Oxford Handbook of Analytical Sociology,* edited by Peter Bearman and Peter Hedstrom (Oxford: Oxford University Press, 2011), 72-93.

[692] Silver, "The Moodiness of Action," 205ff.

[693] Colin Campbell, "Distinguishing the Power of Agency from Agentic Power: A Note on Weber and the "Black Box" of Personal Agency," *Sociological Theory* 27, no. 4 (2009): 407-418.

[694] Reed, *Interpretation and Social Knowledge,* 135-36; Hedstrom, *Dissecting the Social*, 38.

[695] Mario L. Small and Jenna M. Cook. "Using interviews to understand why: Challenges and strategies in the study of motivated action." *Sociological Methods & Research* (2021): 0049124121995552.

"explain" their actions in the non-technical sense of providing "reasons" and "justifications" for action to both sociological interviewers and one another.[696]

As an explanatory practice, then, the personal vocabulary seems exceptionally well-designed to answer "*why*" questions.[697] And yet, what sociologists pursue on these grounds as interpretive explanation suffers because, as we alluded to earlier, it remains indebted to a form of non-probabilistic reasoning and a discontinuist vision. As such, new discontinuities appear even while others are blurred. The problem with achieving continuity based on a personal vocabulary is that it must ignore and protect against the subpersonal to work. Thus, we can find arguments that to be concerned with cognition as a sociologist is analytically "small" and reductive.[698] To make these associations with cognition, however, reveals more about trying to maintain the segmentation of an autonomous "personal" vocabulary that can, in some sense, be threatened by citing processes that it cannot explain than it does about what "cognition" might, in fact, mean.[699]

Outside an explicit mention of prediction, anticipation, expectation, or even "following a rhythm" (akin to music) or "judging what is probable" in a vocabulary compatible with belief or desire, there is no way that such an approach can make probability directly relevant for action, which means that action must *always* be oriented by "belief" and "desire." On these grounds, we can see why the desire-belief-opportunity (DBO) approach generates controversy.[700] It appears to make uncomfortably clear that nominalism ("in name only") leaves a deep imprint on present theories of action, which the data science critique seizes upon as *merely* common sense masquerading as social-scientific explanation.[701]

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[696] See the discussion of "the *Verstehen* bubble" in Turner, *Cognitive Science and the Social*, chap. 8. In this respect, most interpretivist sociologists are methodological Davidsonians (Davidson, "Action, Reasons and Causes") seeing reasons provided by the laity as causes of action—in some technical but unspecified sense. This makes sense given the various anticipations of those arguments, threading the needle between hermeneutics and naturalism, found in Weber's methodological writings. See also, Michael Strand, "Sociology and Philosophy in the United States Since the Sixties: Death and Resurrection of a Folk Action Obstacle," *Theory and Society* 49 (2020): 101-150.

[697] Why, for instance, do poor Black and Brown women in Philadelphia forgo the security of marriage and have children outside of wedlock at an early age, despite valuing marriage as much as anyone else? Kathryn Edin and Maria Kefalas, *Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage*, (Berkeley: University of California Press, 2005). Why does large-scale racial inequity persist despite de facto equality in the post-Civil Rights Era in the US? Eduardo Bonilla-Silva, *Racism Without Racists: Color-Blind Racism and the Persistence of Racial Inequality in America* (New York: Rowman and Littlefield, 2006).

[698] Matthew Norton, "Meaning on the Move: Synthesizing Cognitive and Systems Concepts of Culture," *American Journal of Cultural Sociology* 7, no. 1 (2019): 1-28; Alison Pugh, "What Good Are Interviews for Thinking about Culture? Demystifying Interpretive Analysis," *American Journal of Cultural Sociology* 1, no. 1 (2014): 42-68.

[699] Mark Rowlands, *The New Science of the Mind: From Extended Mind to Embodied Phenomenology* (Cambridge: MIT Press, 2010).

[700] Gianluca Manzo, "Analytical Sociology and its Critics," *European Journal of Sociology* 51, no. 1 (2010): 129-170.

Non-probabilistic reasoning like this does not allow what sociologists name as “desire” and “belief” to be a particular form or figuration of action, which must allow that both belief and desire have a chance-like moment, or trial, as an actualized potential. This is very different from finding them to be of strictly analytic significance, knowable but not real. We can, of course, record data on beliefs and desires, and find correlations within frequencies, but not in a way that can translate beliefs and desires into action while remaining probabilistic (a point we emphasize further in the next chapter). As we have argued, anything of sociological significance is real but unknowable, because it *is* probabilistic. To remain consistent with that point and still use two terms (“belief and “desire”) so essential for personal explanation, we must acknowledge a basic probabilistic process that is both subpersonal and vertical: specifically, observable in action as it tries to predict sensory inputs retrieved from a probabilistic environment, action that generates those inputs to be “recognized” in the form of encoding or adjustment, and action that seeks to reduce “free energy” by bringing the world into alignment with expectations.

Probabilistic sociology calls for radical continuity both *vertically and horizontally*, and *personally and subpersonally*, segmenting only according to distinctions *within* these divisions rather than between them. In some cases, usually involving psycho- or neuropathology, the personal vocabulary breaks down and cannot, by itself, account for action patterns. Particularly given the legacy of psychoanalysis, suspicion of personal explanations of action is relatively common in this particular sense.[702] Modern cognitive science, however, is rooted in the idea that there are efficient and *regular* (as opposed to abnormal) causes of action that explain *why* it occurs in the way that it does that cannot be accounted for by a personal vocabulary.[703] These are typically referred to as *subpersonal*. Thus, somebody “feeling” pain is a personal level event that people can report in a manner that directly affects their actions. That is all we have as personal-level data. Any further "why" questioning must lead us to the "mechanical" world of the nervous system and its activities. We can explain the action by pointing to an organized sequence of neurophysiological processes, but we would no longer be engaging in personal explanation; instead, this would be producing a *subpersonal explanation of action*.[704]

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[701] See Watts, “Common Sense and Sociological Explanation,” 327. See also Omar Lizardo, “Forward,” in *Sexual Fields: Toward a Sociology of Collective Sexual Life,* edited by Adam Isaiah Green (Chicago: University of Chicago Press, 2013), vii-xiii.

[702] Adolf Grünbaum, *The Foundations of Psychoanalysis: A Philosophical Critique* (Berkeley: University of California Press, 1985); Paul Ricoeur, *Freud and Philosophy: An Essay on Interpretation* (New Haven, CT: Yale University Press, 1970), 32ff.

[703] Daniel Dennett, “The Part of Cognitive Science that is Philosophy,” *Topics in Cognitive Science* 1, no. 2 (2009): 231-236.

Note, however, that even when we *drop* from the personal level to the level of "brains and events in the nervous system" and point to a *series of events over time* (nociceptor activation, a signal traveling via pain fibers, etc.), we are still engaging in a *horizontal* explanation of the action in question (e.g., withdrawing our hand from, say, a hot stove after touching it and not anticipating that it was hot) that deals with a causal sequence in time.[705] In this respect, the "subpersonal" explanation seems very much like the "personal" explanation that sociologists use to explain, for instance, why middle-class conservative white people vote for Trump—e.g., they felt that favored minorities were allowed to "cut in line" by liberal political elites, which alienated them from those elites, and made them susceptible to an anti-elite populist message and persona.[706] More implicitly, there is a further explanatory segmentation found in differentiating the personal from the subpersonal. This is the difference between horizontal and *vertical* explanations.[707] We are "explaining" someone's actions when we *drop* from the personal vocabulary and make recourse to subpersonal processes that are analytically distinct. But we also do so when we, say, *move up* and link subpersonal processes like prediction error minimization to the "layer upon layer of sociocultural structures and practices" that constitute the probabilistic landscapes in which we act.[708]

This "dropping-down" or "moving up" refers to vertical explanation, while a temporal causal series refers to horizontal explanation. More specifically, horizontal explanations proceed from past to future, representing events as they fit on a diachronic line of temporality. They are "the explanation of a particular event or state in terms of distinct (and usually temporally antecedent) events or states."[709]

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[704] Bermudez, "Personal and sub-personal; A difference without a distinction."

[705] Daniel Dennett, *Content and Consciousness* (London: Routledge, 2010/1969), 93.

[706] Arlie Hochschild, *Strangers in their Own Land: Anger and Mourning on the American Right* (New York: The New Press, 2016).

[707] Jose Bermúdez, "Personal and Subpersonal: A Difference without a Distinction," *Philosophical Explorations* 2 (2000): 63-82.

[708] Andy Clark, *Surfing Uncertainty*, 294.

[709] Jose Bermúdez, *Philosophy of Psychology: A Contemporary Introduction* (London: Routledge, 2005), 32;

Vertical explanations, by contrast, move *between* levels, "explaining the abilities or dispositions an organism has in terms of its parts and their causal relations."[710] As alluded to earlier, this means that we must distinguish *horizontal continuity* in the temporal flow of events from *vertical continuity* cutting across different levels and kinds of formations and distributions of probability. When it comes to action, the vertical/horizontal distinction can crosscut the personal/subpersonal one. For instance, the usual interpretive explanation of action is both *personal and horizontal*: "when we explain a person's behavior, we cite the sequence of mental events that preceded the behavior, primarily in terms of propositional attitudes such as the person's beliefs and desires."[711] The philosopher Daniel Dennett, meanwhile, argues that in being forced to drop to the subpersonal level to explain, say, the way our hand withdraws from a hot stove, we come up with an explanation of action that is both *subpersonal and horizontal*.[712] Here a sequence of events in the nervous system accounts for the behavior.

We can also imagine an explanation of action that is both *personal and vertical*. For instance, sociologists influenced by Schutz can take long stretches of action ("projects") and see these as being composed of shorter stretches of action.[713] Both the longer and shorter stretches can be rendered in the personal language of goals, desires, intentions, anticipations, and the like. The "vertical levels" of decomposition are defined in terms of nested timescales, thus incorporating a horizontal component at each level. In the same way, subpersonal explanations can be arranged in successive "vertical" mereological levels to explain a given subpersonal mechanism (e.g., the visual cortex) as composed of

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Matteo Columbo, "Constitutive Relevance and the Personal/Subpersonal Distinction," *Philosophical Psychology* 4 (2013): 547-570.

[710] Thomas Metzinger, "The Myth of Cognitive Agency: Subpersonal Thinking as Cyclically Recurring Loss of Mental Autonomy," *Frontiers in Psychology* 4 (2013): 931-945, quotation is on p. 937.

[711] Zoe Drayson, "The Uses and Abuses of the Personal/Subpersonal Distinction," *Philosophical Perspectives* 26, no. 1 (2012): 1-18, quotation is on p. 3.

[712] Dennett, *Content and Consciousness*, 101ff.

[713] Tavory and Eliasoph, "Coordinating Futures." As proposed by Isaac Reed's recent framework, actors can form their own projects and also be enlisted as part of the projects of "rectors" (and/or be marginalized and vilified as "others") Agency is marked by this enrollment, and as distinguishable from action, agency consists of the project-making capacities of additional persons *in lieu* of their own potential for projects. Thus, the nation-state consists of such collective agency, or "King's second body," as it can be decomposed as a project of its agents who, even peripherally, act on behalf of the rector. Isaac Reed, "Chains of Power and Their Representation," *Sociological Theory* 35, no. 2 (2017): 87-117; Issac Reed, *Power in Modernity: Agency Relations and the Creative Destruction of the King's Two Bodies* (Chicago: University of Chicago Press, 2020).

lower-level structural and functional brain networks, synapses, and the like.[714] These types of explanations are therefore both *subpersonal and vertical.*

	Vertical	*Horizontal*
Personal	**"Projects"**	**Folk Psychology**
Subpersonal	**Reductionism**	**Behaviorism**

Table 2: Non-Continuist Segments in Theories of Action

Table 2 depicts these relations schematically according to the combinations verticality/horizontality and personal/subpersonal. Rendered this way, however, the segments are maintained; even as explanations attempt these combinations, they are not continuist. Reductionism is situated as subpersonal and vertical, relative to a "project" focus as personal in orientation but sharing the same concerns with arrangements across levels of analysis.[715] Behaviorism is the non-continuist version of subpersonal horizontal explanation. While folk psychology appears as the opposite of reductionism here, with the caveat that folk psychology can be given a probabilistic application in reducing prediction error and arbitrariness in everyday action which, insofar as it remains horizontal, is entirely unpredictable, but through orientation to this "narrative practice" can be subject to expectation and a looping effect.[716] The sequential relations of stimulus and response, can be explicable in horizontal terms as behaviorism; in most cases, however, this presupposes vertical linkages, which will not be immediately apparent.

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[714] Hae-Jeong Park and Karl Friston, "Structural and Functional Brain Networks: From Connections to Cognition," *Science* 342, no. 6158 (2013): 575-580. The only other action-theoretical construct to behave similarly in the sense of being able to cut across the vertical explanatory hierarchy and to even be applicable to human (and sometimes non-human) actants is, indeed, *habit*; see Mark Sinclair, "Ravaisson and the Force of Habit," *Journal of the History of Philosophy* 49, no. 1 (2011): 65-85.

[715] This particularly applies when actors are enrolled into a project, though presumably they are not the only one, and neither is the project personal. This suggests a vertical arrangement, which does not necessarily mean "higher" but instead working across vertical levels typically segmented.

The crucial fact, however, is that to maintain these segmentions, without vertical and horizontal linkages, will lead any explanation of action into various traps. Predictive processing recognizes this, at least in its gesture toward a subpersonal/vertical link by explaining active inference as a sociocultural practice. Figure 3 depicts a different kind of dynamic, in which these linkages are emphasized as opposed to being segmented. But this is not as unusual as it might appear at first; as we have suggested, engaging in subpersonal accounting, of this sort, is fairly typical in sociology. The tendency is to credit collective objects as subpersonally responsible for actual (observable, measureable) social action. However, this feeds into a segmentation that replicates the Comtean divide and the separation of interpretation (which remains with "projects") and probability (resembling a reductionism and behaviorism).

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[716] This involves the expectation that an actor be able to give a belief/desire account of what they are presently doing, what they have done, and what they will do. See, Kristin Andrews, "The Folk Psychological Spiral: Explanation, Regulation, and Language," *Southern Journal of Philosophy* 53, no. S1 (2015): 50-67.

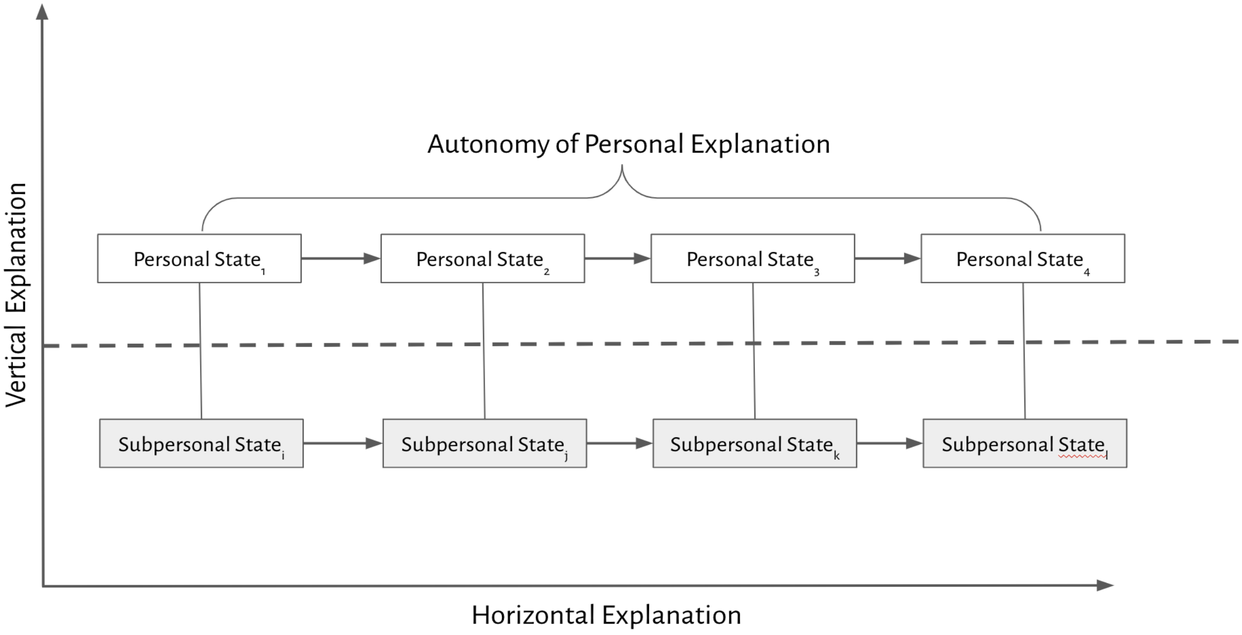
Autonomy of Personal Explanation
Personal State$_1$
Personal State$_2$
Personal State$_3$
Personal State$_4$
Subpersonal State$_i$
Subpersonal State$_j$
Subpersonal State$_k$
Subpersonal State$_l$
Vertical Explanation
Horizontal Explanation

Figure 3: A Model of Continuist Explanation

Here is what we suggest: to segment certain collective objects (groups, structures, cultures), requires that we acknowledge the same arrangement in action, which means making it horizontal in addition to vertical. This is not such an original point, but consider the following addendum: if they are to have any horizontal presence in action, then collective objects, or the concepts that sociologist often use to give their accounts verticality (structure, culture, groups), must refer to a *pattern of resolving prediction error*, aimed here at error or contingency minimization, which can be collective, shared, and derive from the objective situation of social groups. Probability becomes the means of linkage, as we can register descriptions of the same thing both personally and vertically ("norms," "constraint," "social identity"), as well as subpersonally and vertically ("prediction error"). Expectations and statistics, as we have claimed, serve likewise as equal but different descriptions of the same thing: objective possibilities that we can only asymptotically approach and learn, rather than completely know. This means that there must be a way of creating a uniformity of orientation.[717]

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[717] See Daniel Hutto, Shaun Gallagher, Jesús Ilundáin-Agurruza, and Inês Hipólito, "Culture in Mind—An Enactivist Account: Not Cognitive Penetration But Cognitive Permeation," in *Culture, Mind and Brain: Emerging Concepts, Models, Applications*, edited by L.J. Kirmayer (Cambridge: Cambridge University Press, 2020), 163-187. The organic composition of bodies arises from the percepts and affects of which organs become capable. The zones of mind and body are not, therefore, abandoned to medicine or cognitive science, as they are constantly subject to vertical capture and may obtain even world-historical significance. See also, Alphonso Lingis, "The Society of Dismembered Body Parts," in *Deleuze*

With a strictly horizontal focus, the boundaries are rigidly maintained because there is only one way of relating to the future, or only one way that will be considered. The primary boundaries maintained are vertical boundaries. Eliminating these boundaries leads to new connections and, thus, for a vertical account, the task is to find the relevant levels that have become vertically arranged, creating collective objects that, we can say, are disposed in similar ways, with similar tendencies. This must involve a kind of capture between levels, whether of lower levels traditionally associated with neurons, synapses and organs, or higher levels associated with states and economies. To arrange these vertically is to make a connection between synapses and something with enough uniformity and range to be social, political, and world-historical. The result of a vertical arrangement is "emergent," but not in the typical sense of transforming lower-level properties through their combination. A vertical arrangement is emergent, rather, in its construction of higher level or collective properties through repetition and a common orientation to *Chance*.

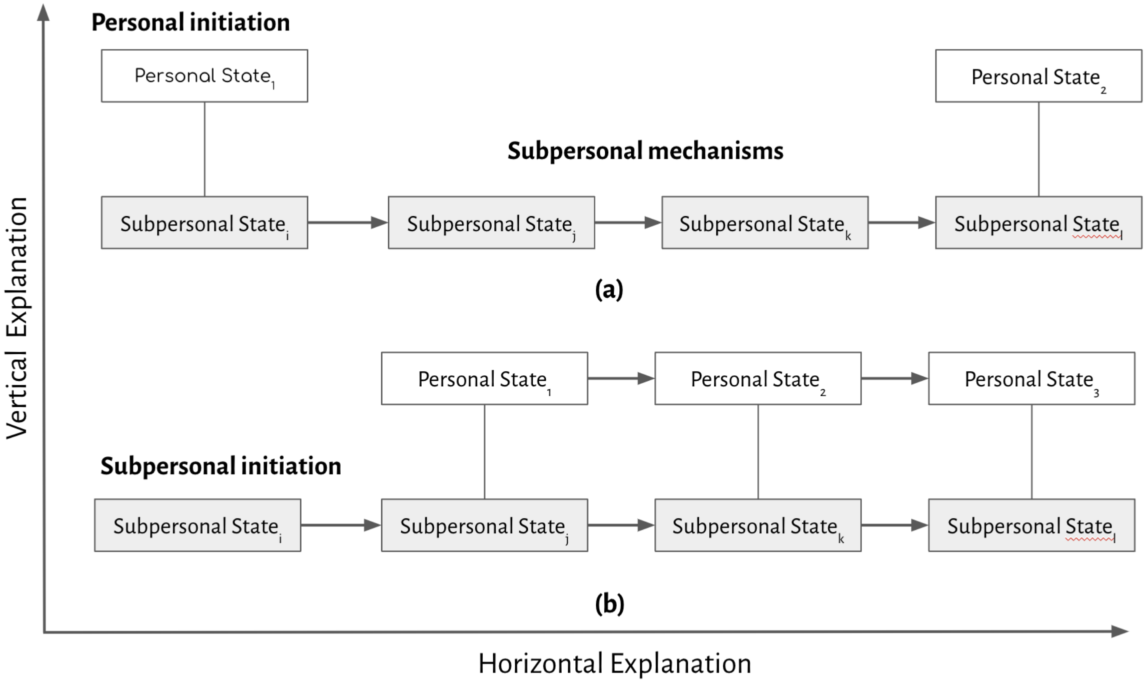
Personal initiation
Personal State$_1$
Personal State$_2$
Subpersonal mechanisms
Subpersonal State$_i$
Subpersonal State$_j$
Subpersonal State$_k$
Subpersonal State$_l$
(a)
Personal State$_1$
Personal State$_2$
Personal State$_3$
Subpersonal initiation
Subpersonal State$_i$
Subpersonal State$_j$
Subpersonal State$_k$
Subpersonal State$_l$
(b)
Vertical Explanation
Horizontal Explanation

Figure 4: Two Different Types of Continuist Linkage

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and the Theater of Philosophy, edited by Constantin Boundas (London: Routledge, 1994), 289-303.

In Figure 4, the continuist linkages are shown through two different initiation sequences: one that starts at personal level, the other at a subpersonal level. These are two different ways of initiating a loop through an original orientation to *Chance,* whether this is made possible through a horizontal project or a vertical capture. A horizontal project starts with a personal initiation in something that resembles the explicit positing of *beliefs about* and *desires for*, which could take the form of getting a job, having a child, getting married, joining a social movement, or, as in Weber's famous case, being told what you need to do (believe and desire) for the *Chance* to make some desirable personal state (e.g. being "elected" to a Christian Heaven) actual after death.[718] Whatever form a project takes, if it is to not remain artificially segmented, must find a subpersonal linkage (or vertical capture) to be sustained horizontally through error reduction, as in Weber's case the reduction of anxiety and boosted self-confidence from "work in a calling."

A vertical capture of subpersonal mechanisms by an explicit project can be constructed in a personally autonomous form as beliefs and desires (e.g. talking yourself into it).[719] Yet typically, for sociology, this demands a break from personal autonomy, by taking account of social structures, institutional logics, landscapes of meaning and the like, all vertically arrayed and affording predictability between many individuals in *spite* of their personal autonomy. A vertical capture is not a singular intervention, however, which allows for no chance of *not* looping in and therefore implies a latent determinism when we try to understand them probabilistically. As we have suggested, orders typically analyzed as macro only have predictable duration through action that loops back into their probabilistic order, rather than drifting off into other orientations (and chance causation).[720] As probabilistic orders, then, vertical arrangements can be maintained subpersonally, or through PP mechanisms that make them probabilistic, like active inference and prediction error minimization, or what more specifically counts as acting (forward) in time but looping back into an original capture more or less tolerant of change-making trials and novel tests. We act within these orders as presumed worlds never entirely complete, where mystery and uncertainty remains, for which we must fill in the blanks (make the right inferences). Our action becomes a form of maintenance, leaving us essentially blind to some precepts just as we take particular ("precision") notice of others. Personally, this can appear as having an interest, a passion, a duty, or even an addiction, all of which refer, in some sense, to *motivations*.

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[718] Max Weber, *The Protestant Ethic and the Spirit of Capitalism*, translated by Stephen Kalberg (Los Angeles: Roxbury Publishing, 2001/1904-05); see also Stephen Kalberg, "The Rationalization of Action in Max Weber's Sociology of Religion," *Sociological Theory* 8, no. 1 (1990): 58-84.

[719] Daniel Winchester and Kyle Green, "Talking Yourself into It: How and When Accounts Shape Motivation for Action," *Sociological Theory* 37, no. 3 (2019): 257-281.

[720] This includes an orientation toward our own physiological states and things immediately accessible to us given how our body happens to be arrayed in physical space (of temperature variability, time of day, distracting influences of one form or another). See Wanja Wiese, "Action is Enabled by Systematic Misrepresentations," *Erkenntnis* 82 (2017): 1233-1252.

In proposing vertical and horizontal linkages, the continuist frame we propose here finds a partial analogue in what medical sociology has long insisted upon as the social determinants of health. This framework, similarly, eliminates the vertical boundary that makes a strictly individual orientation to the *Chance* of health possible or even meaningful.[721] Horizontally, we can point to causes of health that distinguish an individual level, but acknowledging the vertical, we identify a capture of individual health, making it (horizontally) repeat objective probabilities made actual and observable at a group or collective level (e.g., college-educated, person of color, or those without authority or autonomy at a workplace).[722] This creates a possible tension (and test) of one set of factors by another—a more fine-grained segmentation of what will be collective versus individual, general versus particular. The latter, in this case, is typically overwhelmed, but this is not only a statistical fact.[723]

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[721] Paula Braverman, Susan Ergeter, and David Williams, "The Social Determinants of Health: Coming of Age," *Annual Review of Public Health* 32 (2011): 381-398.

[722] Ibid, 386ff.

[723] The arrangement of sexual desire by a field provides a further example of vertical organization. Desires that might otherwise find no specific orientation to *Chance* instead become patterned and expectable, but this is only possible because of how probabilities translate into our qualitative experience of desire, which is understood to be fluid. See Adam Isaiah Green (ed.), *Sexual Fields: Toward a Sociology of Collective Sexual Life* (Chicago: University of Chicago Press, 2013).

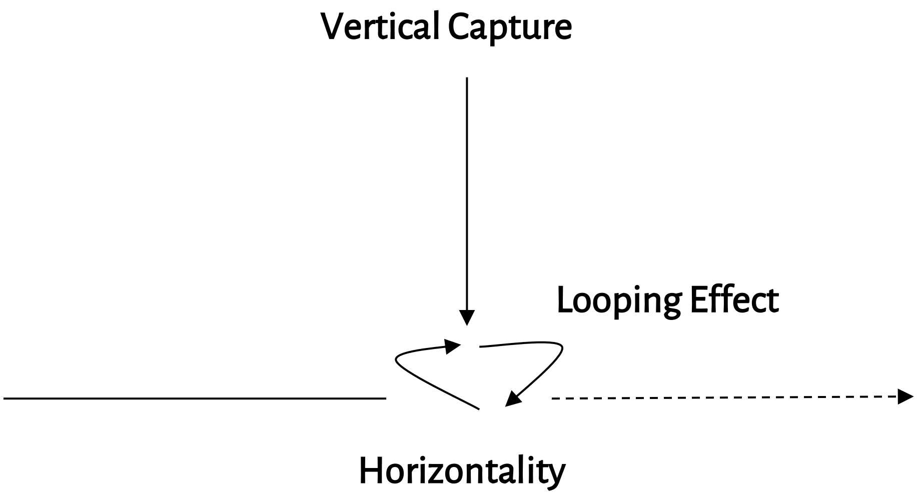

Figure 5: The Looping Effect and Vertical Capture

Thus, relative to what can be accounted for in strictly horizontal terms, the vertical effect of a probabilistic order can come as a surprise, as it can defy what is biographically expected. When a probabilistic order appears, PP tells us that, subpersonally, we orient to it by acting in ways that minimize prediction errors that would otherwise dissolve it into randomness. The looping effect, therefore, is a kind of subpersonal effect that achieves horizontality, or what is a different way of saying *maintenance in time*.[724]

Explaining Addiction as Action

We can illustrate what this means with an example from the extreme edge: *addiction*.[725] What is novel about this understanding of addiction is that it, in a PP sense, becomes a type of *action* in its most fundamental mode, starkly contrasting with quick assumptions that addiction is marked most of all by the *absence* of action (because it is driven by biological necessity and mechanical causes). To "have" an addiction, or to "be" addicted is conceptualized, instead, by PP to be a way of remodeling the world to fulfill certain, singular expectations at the expense of expectations oriented by basic health, bodily and social integrity. Those (normative) states, more specifically their maintenance, become evident in the contrast presented by countervailing "addictive" error-minimization.

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[724] Looping, here, contradicts an easy distinction like the one proposed by Claude Levi-Strauss between "hot" and "cold" societies, with the latter attempting to do everything to eliminate "historical factors," while the former makes history the "moving power of their development." To breach this kind of dichotomy, "history" is less at stake than the relative taming or invitation of chance as different ways of experiencing time. See Claude Levi-Strauss, *The Savage Mind* (London: Weidenfeld and Nicholson, 1966), 233-34.

[725] Mark Miller, Julian Kiverstein and Erik Rietveld, "Embodying Addiction: A Predictive Processing Account," *Brain and Cognition* 138 (2020): 105495.

In a volatile, probabilistic environment, we must act in ways that result in us being well-attuned but adaptable, as we "modulate the precision assigned to affordances in response to such volatility." This allows for flexibility within a potentially wide range, but the tendency is to regress toward an objective probability: specifically, following a train of confidence in our current sensory state as indicators of future ones, rather than guessing those future ones. In subpersonal terms, dopamine signals indicate a kind of "confidence (or lack thereof) that … current sensory states will lead to expected future sensory states."[726] This dopamine signal, and our precision expectations, "are attuned to [our] changing circumstances based on bodily feelings."[727] Those feelings serve as indicators of how we fit with an environment: "feedback from the body alters the dynamics within the organism as a whole to ensure that the organism remains well adapted to a dynamically changing environment." This is based on the "circular causal relationship" that we enter into.

Addiction will hijack this loop, altering how "the organism and the structuring of the environment continuously co-arise together."[728]

> The life of many (but not all) addicts becomes increasingly chaotic in other regards. As soon as the drug's effect wears off, what they return to is a world offering all of the uncertainty that never really went away. So long as the addict is high, it seems to them as if they are succeeding at maintaining grip on what matters to them. Once the drug wears off, they find reality is very different.[729]

This suggests that when the environments that we are in are social environments, we acquire a sense of normativity, of what we *should* be doing. We have little choice in this. Addiction creates a mismatch with the "environment" that puts bodily integrity at stake, leading addicts to go without food, hydration, sleep, and the like in not following current sensory states that would lead them to expect future ones in which such organic expectations are met. In sociologically specific terms, we could refer to this as *having an interest* and the forward momentum of current to expected sensory states as *being motivated.* To be addicted is to have motivation, and it works in this way. Yet, the consequences of this particular interest come at the extreme cost of having any others.

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[726] Ibid, 7.

[727] Ibid, 7.

[728] Ibid, 8.

[729] Ibid, 9.

This basic framework does not change between addiction and non-pathological interests or motivations; the latter do not have substantial negative ramifications for basic bodily integrity by forbidding responsiveness to volatile environments.[730] Yet, in the same manner, those environments co-arise with people's interest as zones of potential *on the body*, which likewise become oriented toward confidence cues (biochemical or otherwise), as responsiveness to being interested and motivated, sometimes by urgent recognitions of *needs,* of what must be done, which errors must be corrected and what must be brought into place, arising as mismatches with expectations.[731]

This is error minimization, in subpersonal terms, and so it must ultimately resort back to a vertical capture: the formative moment when minimizing *these* errors (rather than others) became a prerogative. What we see here, *in nuce*, is the birth of repetition. This is the production of movement in time that will construct a pocket of predictability.

The Study of Action as the Study of Probability

To link cognition, perception, and action as predictive processing provides a template that helps articulate the same basic process that, for Weber as for Bourdieu (see the chapters in part II), marks

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[730] On this score, see Seth Abrutyn and Omar Lizardo, "A motivational theory of roles, rewards, and institutions," *Journal for the Theory of Social Behaviour* (2022).

[731] There is some parallel here with the concept of "ontological security" that Anthony Giddens borrowed from the psychoanalyst R.D. Laing. This refers to a "person's fundamental sense of safety in the world and includes a basic trust of other people." Obtaining this trust is "necessary in order for a person to maintain a sense of psychological well-being and avoid existential anxiety." For Giddens, the appeal of routines is rooted in maintaining this kind of security, which additionally makes it possible to maintain an orientation to "everyday activity." This account is entirely horizontal. For Giddens, life-changing events do the most to challenge ontological security, as they suddenly happen on a horizontal plane as that which disrupts a biography. Because his approach does not include verticality, Giddens must explain routines as having the quasi-functional purpose of warding off ontological insecurity—we do routines for this purpose. If we include a vertical dimension, routines are attached to durational looping effects. If the effect is to not allow ontological insecurity to take hold then it is because the routine literally maintains a state of predictability. Without a vertical dimension, Giddens cannot account for either security or insecurity; with a vertical dimension, the alignment of routine, predictability and ontological security makes sense of the latter as a prediction-based phenomenon, or what involves loops of fulfilled expectations. Anthony Giddens, *The Consequences of Modernity* (Stanford: Stanford University Press, 1990), 37; Anthony Giddens, *The Constitution of Society: Outline of a Theory of Structuration* (Berkeley: University of California Press, 1984), 37.

sociology's approach to interpretive explanations that concentrate on action. What we propose is an integration between two probabilistic perspectives. If cognitive science, under the auspices of PP, recognizes the need to incorporate sociocultural practices, then this provides a window of opportunity.[732] As we have shown, it is difficult for sociologists to not make subpersonal, vertically arrayed kinds of claims, even if this does not align easily with the maintenance of personal explanations of action. This means that action explanation becomes a special preserve, maintained by careful segmentation. The problem this creates is one that Weber noticed: only by explaining action can sociological explanations find adequate causation. Predictive processing, as we have suggested, offers a compatible tool for integrating action at multiple levels, across segments, in a continuist sense. For PP, action is a constant, dynamic process, closely integrated with cognition and perception.

Our recommendation is that reformulating sociological explanation can learn from the PP effort to theorize action, but to take this on board demands that sociologists break habits that, above all, keep interpretation and probability as separate analytic concerns. The silver lining is that Weber and Bourdieu already did this, and in applying probabilistic reasoning they make points (and even construct sentences) that prove astonishingly akin to arguments now proposed independently within the PP paradigm. What would it mean to bring a sociological expertise in sociocultural practices to bear on this conversation? One proposal is that this demands a *continuist* perspective, that would ask that we account for a sociocultural practice on probabilistic terms, an approach which does not respect baked-in segmentations between what can adequately cause human action and what retains only a chance relation to it.

Take the following example in which the basic principles of predictive processing are used to apply to a familiar situation: "the coffee cup sitting on the table is a prediction error that is rectified by bringing it to our lips."[733] When we fill a coffee cup and put it on the table, we engage ourselves in a predictive process in which we will continually predict drinking from it until the coffee cup is empty, or until we forget about it by attending to other prediction errors, as our active inference makes other errors more pressing. Still, we encode an expectation of caffeine intake (or at least the taste of coffee) that we will actively infer until we no longer notice its absence.

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[732] Samuel P. L. Veissière, Axel Constant, Maxwell JD Ramstead, Karl J. Friston, and Laurence J. Kirmayer. "Thinking through other minds: A variational approach to cognition and culture." *Behavioral and Brain Sciences* 43 (2020).

[733] Clark, *Surfing Uncertainty*, 13ff.

Such an explanation would appear to commit a couple *faux pas* of cognitive social science. The explanation is reductive using subpersonal explanatory terms (prediction error, active inference) to describe a horizontal process (drinking coffee) more amenable to a standard personal language (belief, desire). Furthermore, does this not lend subpersonal processes *personal* characteristics, as if neurons "want" or "believe" (or even "predict")? What this example does not specify is how this simple action is highly contextual. What remains unstated are the aspects of coffee drinking as a social action. For example, the absence of caffeine is not typically noticeable at 2:30 AM as it is at 7:00 AM, but only because of social and cultural constructions. Yet the goal is to avoid completely shattering the adequacy/chance distinction with arguments to the effect: "industrial capitalism caused coffee drinking." Without considering how this arises from the perceptual fluency of habituation, however, in which the generation of free energy is chased by predictive coding, we will read this as a top-down proposal in which categorization, rather than objective probability, comes *first.*

The proposed integration of probabilistic sociology and predictive processing implies different conditions of adequate causation in this case: associations between coffee drinking and morning awakening as a unitary, durable experiential pattern; the embodied expectation of caffeine as part of other rhythms and orders of succession for which it becomes a precondition; our looping into objective probabilities as we try to keep pace in multiple modes and on multiple levels. While the example fits with typical expectations of isolated philosophers contemplating objects (candles, chairs, cups) in lonely surroundings, which have so often led theories of mind and body astray, we can pull a general lesson from this one by accepting the invitation of probabilistic sociology to jump through the window already opened by PP and recognize how loops, at least in cases involving humans, are almost always categorizable as "sociocultural practices." Sociocultural practices become necessary for the account here, as the habit observed is, as this would suggest, *more* than contingently connected to the probabilistic loop in question even viewed subpersonally. Caffeination *is* contingent in the historical sense as a sociocultural practice constructed by unpredictably converging factors and unintended consequences (clear only after the fact), even if, for one guided by PP, it is astonishingly *predictable* as a sociocultural practice.[734]

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[734] Sidney Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (New York: Penguins, 1986); see also Marshall Sahlins, "The Sadness of Sweetness: The Native Anthropology of Western Cosmology," *Current Anthropology* 37, no. 3 (1996): 395-428.

As we have stressed, what people notice and perceive does not arrive from a top-down categorization, except in circumstances that find no objective probabilities to loop into and in which we must cast a net over what, from the perspective of action, *is* an abyss and a chaos. In PP terms, this would be a situation fraught with free energy, of the incapacity of predictive coding to predict sense information beyond a limited threshold, which would require the construction of a model as explicit and public "meaning." While Weber is widely considered to be the major source of sociologists' efforts to understand social action, we believe that he would have the same critique of theories of action that make this kind of process *de facto*. A probabilistic approach to sociology, on the contrary, aligns with predictive processing in drawing attention to *probability looping* that must come first before other action can follow, even this kind of meaningful action.[735] Accounting for such a loop, as we will argue in the next chapter, means providing a genealogy documentable both collectively and individually, making evident a socially and historically constructed subjectivity fulfilling certain parameters of looping in, observable even in "subjective" probabilities at a subpersonal level.

To be oriented to worldly probability means to have expectations that find a counterpart in something objectively probable about the world. Probabilistic sociology recommends that whatever probabilistic patterning we find in the aggregate must be reflected in probability at lower levels of organization and order, which generally means finding *probability in action,* as the process of engaging with preexisting potential, which is then made actual in some distinctive way, but which is probable not random. In PP terms, this is the minimization of predictive error or free energy by adapting models or changing the world. Generative models for social action, identified at a granular, more molecular level, are only possible because they are general, collective, shared and found in a predictive loop that dictates the nature of inputs from an objective, probabilistic landscape. This, in one sentence, composed with probabilistic reasoning in mind, is the formula for the construction of probabilistic orders.

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[735] The formal recipe for this is, as mentioned above, logical enough, according to Deleuze, as it marks repetition in itself: "repetition is a necessary and justified conduct only in relation to that which cannot be replaced. Repetition as a conduct and as a point of view concerns non-exchangeable and non-substitutable singularities." The loop is what cannot be replaced. It is singular and non-exchangeable. Those who are subject to the loop, on the other hand, *are* exchangeable. See Gilles Deleuze, *Difference and Repetition* (New York: Columbia University Press, 1994/1968), 2.

Chapter 10 - An Outline of Probabilistic Method

> *. . . the die has a certain "would-be"; and to say that a die has a "would-be" is to say that it has a property, quite analogous to any* habit *that a man might have.... and just as it would be necessary, in order to define a man's habit, to describe how it would lead him to behave and upon what sort of occasion - albeit this statement would by no means imply that the habit consists in that action - so to define the die's "would-be," it is necessary to say how it would lead the die to behave on an occasion that would bring out the full consequence of the "would be"; and this statement will not of itself imply that the "would-be" of the die* consists *in such behavior. Now in order that the full effect of the die's "would-be" may find expression, it is necessary that the die should undergo an endless series of throws from the dice box, the result of no throw having the slightest influence upon the result of any other throw, or, as we express it, the throws must be* independent *each of every other.*
>
> ~ Charles Sanders Peirce, "Note on the Doctrine of Chances"

When Charles Sanders Peirce published "The Doctrine of Chances" in 1878, he was a confirmed frequentist, if a slightly heterodox one. The "general problem of probabilities," as Peirce put it at the time, "is, from a given state of facts, to determine the numerical probability of a possible fact."[736] We do this by constructing a data set of observations and finding distributions between *zero* (total contingency) and *one* (total determination). If Peirce deviated from frequentism at this time, he did so by emphasizing that the "idea of probability essentially belongs to a kind of inference," but it is an inference that is only possible based on frequency counts.[737]

By 1910, Peirce changed his tune, as evidenced by the chapter's opening epigraph. This comes from a note that Peirce added to the earlier publication thirty years after it was first in print. It shows how his thinking had shifted in a decidedly probabilistic direction. Not coincidentally, it seems, during the time that elapsed Peirce also proposed many of the basic principles that have come to define pragmatism. As Hacking observes, by 1910, Peirce had essentially come around to the idea that "there is absolute chance in the universe."[738] This is not inaccurate, but it is far too vague as a summary. We can provide a more useful and specific formulation.

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[736] Charles Sanders Peirce, "The Doctrine of Chances" in *Chance, Love and Logic: Philosophical Essays*, edited by Morris Cohen (London: Kagan Paul, 1923/1878), 64-65.

[737] Ibid, 69.

As the quote suggests, what Peirce comes around to by this time is an idea akin to objective probability. For Peirce, a die is not simply a data vector from which we can tabulate a statistical distribution; it is a "chancy object,"[739] comprised, fundamentally, of habits as a reference to what it *tends* to do. Whatever chances we observe and measure in a statistical distribution, they are generated *by* the dice (or more accurately, its dispositional powers). It is a store of probabilities that inheres in it. Furthermore, for Peirce causation could not be defined separately from prediction, which meant that knowing these probabilistic habits was key to making causal claims. Like the Kriesian strain of probabilism, this also presents a distinction of adequacy: if causation is tied to dispositional properties, then it is possible for accidents to happen. But we cannot know what these accidents are without knowing what the propensities are. We can compare dice with other objects, for instance, that might be slightly less chancy or generative of distributions with less limited predictability. We can imagine that for some objects, adequacy is easier to judge; for others, their habits are typically subject to stochastic influences.

In proposing these ideas, Peirce aligns in many ways with probabilistic sociology as proposed above. From him, we can pull a tripartite distinction between *potentiality* (the dispositional property of something), *probability* (what it will do in each test), and *frequency* (what it will do in the long run). Peirce's influence on sociological methods in recent years has been pronounced, but here we deviate slightly from those arguments, specifically by drawing probabilism in. Thus, to follow the pragmatic maxim of knowing what a thing is by knowing "what its practical consequences are" becomes a probabilistic statement about propensities and probabilities. It opens the door to conceive of statistics as an indicator of "practical consequences" as opposed to static formations.

We draw much from Peirce for envisioning an applied probabilism, not least because he so effectively positions a probabilistic style of reasoning against what arises without it: namely, *nominalism*. Yet, as we emphasize, Peirce's approach still appears to be indebted to frequentism in the sense that we still need "the long run" to fully understand the probabilities that objectively apply to certain things like dice (rendering probability, at least implicitly, still a matter of frequency). Peirce did not put probability into action; he features no terms like expectations, nor does he allow for the loop to be present in cognition and perception. As we will emphasize, this means that Peirce also cannot account for single-case probability, while the Krisean strain of probabilism, from Weber to Bourdieu, can. This is important for reenvisioning a sociological method, as only by allowing for single-event probability, or probability independent from frequency, can sociology wean itself from dependence on statistics while remaining probabilistic.

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[738] Ian Hacking, *The Taming of Chance* (Cambridge: Cambridge University Press, 1990), 215.

[739] Mauricio Suárez, "Propensities and Pragmatism," *Journal of Philosophy* 110, no. 2 (2013): 61-82, quotation is on pp. 66-67.

In this chapter, we develop an approach that combines Peirce's insights—as he pushes in a probabilist direction—with probabilistic sociology, drawing from Weber and Bourdieu specifically (see chapters 5-8). Added to that mix now is also W.E.B Du Bois, who, though he knew Weber and studied in Germany not long after Kries published his work on probability, seems to have not been influenced by the Kriesian strain of probabilism, but who nevertheless relies on pragmatist ideas in building his own probabilistic sociology. Weber and Bourdieu both acknowledged that, as part of the sociological project as they understood it, probabilism runs contrary to other approaches, evidenced by Levi-Straussian structuralism in Bourdieu's case and by Comtean collectivism and Spencerian holism in Weber's. As a figure who adopted a probabilistic style of reasoning, we can enlist Peirce's useful toolkit of ideas to gather these points under an intuitive concept and ground them alongside terms and techniques to be defined. This is, in part because when Peirce engaged in probabilism, just as when Du Bois did, he was squarely set against the nominalist technique for affirming difference, which he believed was *inessential* for the task.

From Nominalistic to Probabilistic Reasoning

Probabilism, in a Peirceian perspective, can best be described in comparison with its diametrical opposite: nominalism. From a nominalist perspective, the source of prediction is also the source of action, but the nominalist does not allow prediction to play a role *in* action (which presumably is ruled by necessity), meaning that the analyst alone can expertly witness the object in question. The nominalist, after all, is not concerned with where the explanatory efficacy of the procedures they deploy comes from, and as Peirce points out, nominalism of this or any other sort is deeply ingrained in modern modalities of language and thought:

> The real is that which is not whatever we may happen to think of it, but is unaffected by what we may think of it. The question therefore, is whether a man, horse, and other names of natural classes, correspond with anything which all men, or all horses, really have in common, independent of our thought, or whether these classes are constituted simply by a likeness in the way in which our minds are affected by individual objects which have in themselves no resemblance or relationship whatsoever.[740]

The puzzle here is that individual men, horses, and other things show so much variation it is hard to call them the same, general thing. Yet still we must use these general names. But are they just *names*?[741] If so, this is disastrous because, in that case, science could only study real individuals, as the only definite things, and speak with scare quotes around anything general, or constituted by more than one individual. For probabilism, the difference comes down to whether our methods can accommodate the reality of continuity. For Peirce, "a continuum is a collection of so vast a multitude that in the whole universe of possibility there is no room for them to retain their distinct identities…the continuum is all that is possible, in whatever dimension it be continuous…Thus, the question of nominalism and realism has taken this shape: Are any continua real?…[The] faithful nominalist … says no."[742] Peirce admits that it might make little sense not to agree with the nominalist because thinking otherwise, as this implies, seems to create a more intractable problem: pointing out that neither individuals nor continua, neither particulars nor generals, should be taken as real when it is the

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[740] Charles Sanders Peirce, "Critical Review of Berkeley's Idealism" in *Charles S. Peirce: Selected Writings (Values in a World of Chance*), edited by Philip Wiener (New York: Dover, 1992/1871), 88.

[741] Histories of nominalistic thinking tend to retrieve its genealogy from an impasse of a distinctively medieval variety. When the Franciscan Order of Catholic monks, descended from St. Francis of Assisi and famous for their vow of poverty, were faced with the prospect of becoming wealthy because of their ownership of monastery land rich in agricultural produce, Pope John XXII was initially only too happy to take possession. But the potential administrative burden found the papacy ill-prepared, stationed, as it was at the time, in Avignon rather than Rome due to a recent imbroglio involving the French crown, from which it was still reeling. The Pope moved to return the property to the order. This would have enriched them, contradicting the avowed doctrine of Apostolic poverty. Into this fray William of Ockham (of the famous "razor") entered to disagree with the Pope (and later accuse him of heresy) with what might appear to be imminently sober reasoning: there was no "Franciscan Order"; there were only individual Franciscans. The properties could not be returned to the "order as a whole" because there was *no* order as a whole. See Michel Villey, *La formation de la pensée juridique moderne* (Paris: Presses Universitaires de France, 2018/1975), 228.

[742] Charles Sanders Peirce, *Reasoning and the Logic of Things: Cambridge Conferences of 1898*, edited by Kenneth Laine Kenter (Cambridge: Harvard University Press, 1898/1992), 160-61.

possibilities (propensities, potentialities) that comprise them that are real. To the degree that those possibilities find a distribution as more or less probable (most often the case) this tells us that even those probabilities have something *real* about them.

The *nominalist trap* refers to the tendency to mistake a "continuum of possibilities" for the "definite arrangements" that happen to be visible to us, when it is the dialectic between them that distinguishes "Chance [sic]…as an objective phenomenon."[743] The trap is twofold: (1) it could entail referring to an individual horse as comprising the totality of *possible* horses, or (2) it could entail referring to an individual horse *only* and ignoring it as part of a continuum of possibility. Thus, anything definite (this individual horse) implies a continuum of possibility (horses past, present, and future). To understand the definite thing, to have knowledge of it, we must refer to that continuum.

Probabilistic reasoning never omits concern with these possibilities even though they may never become actual or individual (at least not in the lifetime of an individual scientist). This is doubly true in the human sciences for a specific reason. "If man were immortal," Peirce writes, "he could be perfectly sure of seeing the day when everything in which he had trusted should betray his trust, and, in short, of coming eventually to hopeless misery. He would break down, at last, as every good fortune, as every dynasty, as every civilization does. In place of this we have death. But what, without death, would happen to every man, with death must happen to *some* man…[D]eath makes the number of our risks, of our inferences, finite, and so makes their mean result uncertain."[744] Only *some* things will mark our experience as individuals. Only in infinite time would we experience *all* possibilities. As individuals, what we are is not independent of what we *do* experience in comparison with what we *could* have experienced, and in comparison with what others experience that we do *not* experience. That is the range of possibilities, and these are distributions of chance. On our finite timelines, they reveal to us an existence neither distinctly individual nor indistinctly collective, but inescapably *probabilistic*.[745]

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[743] Ibid, 207.

[744] Peirce, "The Doctrine of Chances," 72.

[745] This point here resembles John Dewey's argument that, likewise, draws attention to an in-between kind of indefiniteness as "aesthetic" experience. Sociologists have more recently mined this for insight into a "social aesthetics" (Martin, *Explanation of Social Action*, chap. 6): "All interactions that affect stability and order in the whirling flux of change are rhythms … There are two sorts of possible worlds in which esthetic [sic] experience would not occur. In a world of mere flux, change would not be cumulative; it would not move toward a close. Stability and rest would have no being. Equally it is true, however, that a world that is finished, ended, would have no traits of suspense and crisis, and would offer no

On a long enough timeline, then, our survival rate *does* drop to zero, as ample time is given for all possibilities, even the least frequent. Yet, as individual and finite, we do not exist on such a timeline. For Peirce, probabilistic reasoning particularly as applied to human science is most distinguishable for its concentration on the dialectic between "definite arrangements" and "continuum of possibilities," combined with the finiteness that applies to individual existence within a range of possibility.[746] A statistical calculation, for example, creates a dialectic between possibilities (general) and definite arrangements (particular) by making indirectly visible a distribution of chances and comparative inferences between definite (actual) arrangements and continuum, to see probability in its storehouse.[747] Even this weak version of probabilistic knowledge, combined with other tools at our disposal, can allow us to form probabilistic judgments relative to the same probabilistic orders as actors do.

Abductive Analysis as a Probabilistic Method

The closest contemporary analogy to a probabilistic method is "abductive analysis," and the parallel is easily understood as derived from a common route through Peirce. Abductive analysis likewise appears in the wake of functionalism, structuralism, and structurationist approaches in that it invites

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opportunity for resolution. Where everything is already complete, there is no fulfillment… Because the actual world, that in which we live, is a combination of movement and culmination, of breaks and re-unions, the experience of a living being is capable of esthetic quality. The live being recurrently loses and reestablishes equilibrium with his surroundings. The moment of passage from disturbance into harmony is that of intensest [sic] life. In a finished world, sleep and waking could not be distinguished. In one wholly perturbed, conditions could not even be struggled with. In a world made after the pattern of ours, moments of fulfillment punctuate experience with rhythmically enjoyed intervals." John Dewey, *Art as Experience* (New York: Perigree, 1980/1934), 16-17. Dewey's mention of "rhythm" here finds a prelude in Du Bois' own probabilistic emphasis.

[746] Does this imply that we should try to reduce the difference between the "possible" and the "definite" to speak as much as we can of inevitabilities? Daniel Dennett makes the observation that even if we tried to do this, the kind of "real patterns" we would observe would have no resemblance to what we actually experience, which often seems only to extend the continuum of possibilities further and further or confront us with more chance and pure difference; Daniel Dennett, *Freedom Evolves,* (New York: Viking, 2003); see also Ian Hacking, "How Inevitable are the Results of a Successful Science?" *Philosophy of Science* 67, no. 3 (2000): S58-S71. Besides, even if we admit that events like tsunamis, asteroid collisions, or earthquakes are inevitable, that with enough time they *will* happen, observing them as definite arrangements with evolution as our continuum of possibilities, they become "evitable" (Dennett's word) or avoidable, particularly their life-destroying potential, at least if continued evolution into future is to be possible.

[747] Luc Boltanski makes a similar point as follows: "This imaginary exit from the viscosity of the real initially assumes stripping reality of its character of implicit necessity and proceeding as if it were *arbitrary* (as if it could be other than it is or even not be); and then, in a second phase, restoring to it the necessity it had initially been divested of, but on which this operation of displacement has conferred a reflexive, general character, in the sense that the forms of identity locally are related to a universe of possibilities," *On Critique: A Sociology of Emancipation* (London: Polity, 2011), 8.

chance rather than trying to use concepts to tame chance before the fact. As Tavory and Timmermans put it, drawing on Peirce, "abduction is the form of reasoning through which we perceive an observation as related to other observations, either in the sense that there is an unknown cause and effect hidden from our view or in the sense that the phenomenon is similar to other phenomena already experience and explained."[748] Thus, if we notice a surprising fact, and we infer that something else must follow, then we have reason to suspect that it actually does follow. This is a recipe for theory-building, as we can use this simple colligation to engage in deduction and collect more observations. Rather than the grounded approach to qualitative analysis which seeks to avoid theory-laden analysis (or theory entirely until the conclusion is written), abductive analysis encourages that qualitative researchers pursue their work with a plurality of theories in mind, as this "may inspire abductive analysis."[749]

Our familiarity with actor-network theory or Marxist theory, for example, might help us abduct upon seeing a long-serving technician from a working-class background laboring in a major media corporation be turned down for a job promotion into production.[750] We might abduct that a class structure impedes their opportunities because of a cultural capital barrier; this particular distribution of chances finds those from upper middle-class backgrounds far more likely to be part of the creative side of media industries, while working-class employees tend to be involved in the technical side of things.[751] Such a string of inferences can sit alongside an entirely different abductive process where we reason differently. Perhaps, we might guess that the technician is simply under-qualified for a promotion because they do not have the right educational background; they have been trained how to run equipment and edit content, not the kind of stuff that qualifies one for content creation.

Theory-building on the abductive model implies an open-ended attitude, at least in the short term. An abductive analyst may "embody all these positions simultaneously, and the solidification of one interpretation over others is far from predetermined at the moment, but may depend on future interactions."[752] We are led toward guessing about the reasons for our initial, surprise observation. With "future interactions" we should be able to solidify one of those guesses, as our abductive analysis begins to fill itself out.

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[748] Iddo Tavory and Stefan Timmermans, *Abductive Analysis: Theorizing Qualitative Research* (Chicago: University of Chicago Press, 2014), 37.

[749] Ibid, 43.

[750] See Sam Friedman and Daniel Laurison, *The Class Ceiling: Why it Pays to be Privileged* (London: Policy Press, 2014).

[751] As, of course, is the case in reality; see Dave O'Brien, Daniel Laurison, Andrew Miles, and Sam Friedman. "Are the creative industries meritocratic? An analysis of the 2014 British Labour Force Survey." *Cultural Trends* 25, no. 2 (2016): 116-131.

In making a surprise a "potential" *to us* this tracks our movement closer and closer to social action. Importantly, what is surprising to the analyst, the order and regularity that they expect, is often *not* surprising to those engaging in social action "on the ground." We might call this "experience-near" probabilism. On the other hand, when a surprise does occur to those engaged in social action, this invites a more "experience-distant" probabilism, as the effort becomes to reconstruct or discover the probabilistic order that could have generated the surprise.[753] Perhaps an established order has been displaced by another? Perhaps an established order has changed significantly? We register these changes by looping into these possible orders, just as we must do to engage in reasonably fluent social action. They are the source of expectations, and when an event presents itself to us in a manner akin to "eruptive instantaneousness," this will lead us to ask whether our expectations are wrong and whether the source of those expectations has changed. Thus, the research task becomes focused on trying to decipher the probabilistic orders toward which actors are oriented, to make a surprising event expected.

Abductive analysis is probabilistic, then, but as we press further into the probabilistic method, the probabilism it allows is the epistemic variety. Each subsequent observation allows us to be *less* probabilistic or "guessy" about our abductive inferences. Tavory and Timmermans build on Peirce to theorize abduction, yet if we account for Peirce's acknowledgement of the "universe of chance" (*Tychism*), then abduction points us in a slightly different direction, toward knowledge of probability and potential as it literally pertains to the world rather than applying to the quality of our guesses.

Taking Potential as a Unit of Analysis

For Peirce, the progress we make via abduction leads us toward the acknowledgement, first, that what we are observing is a general *potential* rather than a purely particular, chance occurrence. Yet, we make this inference not by making our initial guess less probabilistic in an epistemic sense by gathering more data, but by filling and placing that initial, surprising observation *inside* a "potential aggregate" that permits its determination.

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[752] Tavory and Timmermans, *Abductive Analysis*, 44.

[753] The terms "experience-near" and "experience-distant" are borrowed from Clifford Geertz, "From the Native's Point of View: On the Nature of Anthropological Understanding," *Bulletin of the American Academy of Arts and Sciences* 28, no. 1 (1974): 26-45.

> Remembering that the word 'potential' means *indeterminate yet capable of determination in any special case*, there may be a *potential* aggregate of all the possibilities that are consistent with general conditions; and this may be such that given any collection of distinct individuals whatsoever, out of that potential aggregates there may be actualized a more multitudinous collection than the given collection. Thus, the potential aggregate is with the strictest exactitude greater in multitude than any possible multitude of individuals. But being a potential aggregate only, it does not contain any individuals at all. It only contains general conditions which *permit* the determination of individuals.[754]

Here, surprise becomes like an encounter with pure difference or chance, something that we did not expect. Yet, from this basis, our inference can come to track "the generalizing tendency [that] builds up new habits from chance occurrences."[755] As Peirce puts, "there is … every reason in logic why this here universe should be replete with accidental characters, for each of which in its particularity there is no other reason than that it is one of the ways in which the original vague potentiality has happened to get differentiated."[756]

Peirce gives the example of drawing a line on a blackboard with a piece of white chalk. The line, he says, is the introduction of "discontinuity" into an otherwise continuous space, "a springing up of something new." We can, of course, erase the mark and it will be a "mere accident." But when the "mark will *stay* for a little while … the accident acquires some incipient staying quality, some tendency toward consistency."[757] It becomes the mark of a "generalizing tendency, or a generalization," which is the same as "habit." As more lines on the blackboard appear alongside the others, we are led to guess what the generalizing tendency may be—what, in other words, gathers all these marks as part of a continuous thing. It must "have its origin in the original continuity which is inherent in potentiality." This means that what we are dealing with is no "mere accident" but rather a *potential* in the sense mentioned above: an occurrence or event that might forever remain indeterminate but is capable of being determined under certain circumstances.

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[754] Peirce, *Reasoning and the Logic of Things*, 247.
[755] Ibid, 263.
[756] Ibid, 263.
[757] Ibid, 262.

For Peirce, what we are trying to figure out is the "generalizing tendency [that] builds up new habits from chance occurrences," and this means that "many such reacting systems may spring up in the original continuum; and each of *these* may itself act as first line from which a larger system may be built in which it in turn will merge its individuality." These possibilities are all "Platonic," however, and are merely guesses; yet "finally out of one of these Platonic worlds is differentiated the particular actual universe of existence in which we happen to be."[758]

What Peirce describes is compatible with abductive analysis, and its unique concentration on the "firstness" of surprise or chance for qualitative research. We will fill in the picture a bit more by saying that if "X is Y, then Z must follow," or if this line is curved, then it must have a similar curve on the opposite side of the board. If it does, perhaps we can infer that the "actual particular universe" in this case is an oval; if it does not, we consider other possible "Platonic worlds" by considering more durable marks.

Starting with a non-specified chance, then, we *do* reach a "generalizing tendency" or a continuum that includes our observation as a potential, and thus changes it from random *to* potential. By a generalizing tendency, Peirce means something comparable to what we have called a probabilistic order, the knowledge of which is different from the sort of permanent learning that reforms knowledge, or our abductive process, with each new data point. If we are truly dealing with the strict independence of each (instant) observation or each "mark on the blackboard" from one to the next, then permanent learning would be applicable, as there would be nothing *more* to learn apart from these observations (we could not tell whether they were made actual *only* by our observation). When we abduct, by contrast, we infer toward something like a range of possibility; thus, the "universe" we are studying is a *continuum*, linking these observations to what makes them a "determinate potential."[759]

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[758] All quotations in ibid, 263.

[759] The framework here is similar to what we alluded to above as the Aristotelian principle: "the activity of being." A determinate potential is one that has been made actual (i.e. measureable, observable) by action. In Peirce's example, we might imagine each small mark on the blackboard as action, oriented similarly, vertically arrayed in that sense, and therefore repeating, and that constructs what all of the lines *together* construct.

Single-Case Probability and the Limits of Interpretation

The problem of single-case probability is whether we can understand something as probabilistic even though we can only have a single observation of it (one case). For instance, if we flip a coin and an outcome is produced (heads), how can we know how probable it's turning up heads was in that case? For a frequency-based approach, as alluded to earlier, single cases, outcomes or individuals do not have chances or probabilities. Only groups, sets, or classes do. There must be reference to a whole collection of observations or individuals for a probability statement about any one observation or individual to make sense. To have a probability, a single case must have a property that the elements of its group have; it must be first and foremost part of a group that appears based on frequency counts.[760]

As Peirce seems to have noticed, however, this immediately lends itself to a kind of nominalism that arises when the single case is not a source of probability, but the group is, even if a group could not possibly include all the elements of the single case. What does this mean for probability in situations where there is no frequency, no reference classes to build, and therefore seemingly no way to make the outcome probabilistic? We have no sense of the continuum here in which the observation would stand as a definite arrangement. What about instances where there can be only one outcome? Take Peirce's example:

> if a man had to choose between drawing a card from a pack containing twenty-five red cards and a black one, or from a pack containing twenty-five black cards and a red one, and if the drawing of a red card were destined to transport him to eternal felicity, and that of a black one to consign him to everlasting woe, it would be folly to deny that he ought to prefer the pack containing the larger proportion of red cards, although, from the nature of the risk, it could not be repeated. It is not easy to reconcile this with our analysis of the conception of chance.[761]

In this case, we can only take one observation, as the action in question cannot be repeated. Thus, probability, if it is there at all, can *exist* only in a single choice between the two packs of cards. Because it is so singular, we cannot (in Peirce's terms) turn it into anything "in the long run." We cannot, in other words, get a sense for propensities, whether one pack tends to lead to more red cards drawn, and a higher chance of everlasting woe, relative to the other. We cannot have frequency counts here, nor can we draw analogies between cases of choosing. How, then, can we understand single-case probability according to probabilistic ascription, which Peirce claims is quite typical in our lives given our finiteness, as mentioned earlier?

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[760] As the philosopher Hugh Mellor puts it, "for frequentists there is no such thing as a chance p_t (other than 0 or 1) of a single atom [or single person] decaying in a given period of *t* years. Such a chance, in their view, is no more a property of a single atom than, for example, the property of being numerous is." Hugh Mellor, *Probability: A Philosophical Introduction* (London: Routledge, 2005), 37.

[761] Peirce, "The Doctrine of Chances," 69-70.

Usually, sociologists do not attempt to apply probability to single-case probability, because of these restrictions; in fact, most sociologists would not consider this scenario available to a probability. Single-case instances like this are where interpretation, particularly taken in an interpretivist's sense, makes its living. Take another example:[762] Suppose we are walking into a locked building for which we have the key, and, to our surprise, someone approaches us asking to be let in. It is not someone we have ever seen before. Naturally, we are suspicious about who they are, and we begin to abduct, considering relevant details to determine whether we can trust them. How could this involve probability? After all, we do not know this person. We have not seen them in any sort of "long run." We do not have a large-N to draw upon. And our decision is irreversible: we cannot do it again ("roll the dice again" in Nietzsche's words) and accumulate observations. Without any propensity or dispositions that we can identify, this situation seems ripe to be decided by the non-probabilistic or "contingent" exercise of interpretation, as it becomes more like a situation that features chaos.[763]

The interesting thing is that single-case probabilities are exactly what a Krisean probabilism focused on probabilistic orders or *Spielraum* is designed to account for given its dissociation of probability from frequency. In this case, the initial conditions remain stable and allow for many different permutations or probability distributions, which draws our attention (as we have emphasized) to *action*, or what transpires between initial conditions and the probability distribution that we observe. This is quite the opposite of a chaotic condition, as those initial conditions demonstrate stability rather than being extremely sensitive to small variations, the volatility of which requires an arbitrary stabilization.[764] The further point to mention is that by "initial conditions," Krisean probabilism does not mean an experimental set-up; it means an existing objective potential. To return to the example: even for someone to successfully mimic and fake being trustworthy, they would still need to know what the expectations are for appearing trustworthy, and there must be expectations available to (objectively) learn. Those expectations might be arbitrary in their actuality (e.g. to appear trustworthy, wear polished brown shoes), but they are not arbitrary in a probabilistic sense as initial conditions.

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[762] We draw this example from Michael Bacharach and Diego Gabetta, "Trust in Signs," in *Trust in Society*, edited by Karen Cook (New York: Russell Sage, 2001), 148-84.

[763] Isaac Arial Reed, *Power in Modernity: Agent Relations and the Creative Destruction of the King's Two Bodies* (Chicago: University of Chicago Press, 2020), 31-32.

[764] See also Mauricio Suárez, *Philosophy of Probability and Statistical Modeling* (Cambridge: Cambridge University

If this example might appear simplistic or all too convenient, consider what is one of the more famous accounts of single-case probability in all of interpretivist analysis: the anthropologist Marshall Sahlins' narrative of Captain James Cook's arrival at the Hawai'ian Islands in late 1778 and early 1779 and the dramatic event that then unfolded.[765] As Sahlins tells the story, when Cook and his ships the *Resolution* and the *Discovery* arrived off Maui in November 1778, this coincided exactly with Makahiki, a Hawai'ian harvest festival, when the Ku cult associated with the "ruling chief" is put into abeyance, allowing for the temporary ascendance of Lono as the renewal of nature. The procession of Lono lasts about 23 days, after which "Lono himself suffers a ritual death." What is most interesting for Sahlins is the "sufficiently remarkable … correlation between the ritual movements of the Makahiki image Lono and the historical movements of Captain Cook in 1778-79."[766] Cook arrived at the islands when expected according to the expectations associated with Lono's ascendency, stayed as long as expected as he circumnavigated them, and then left basically when expected, disappearing quietly over the horizon.

Then something unexpected happened. The ship *Resolution* "sprung a foremast," and Cook had to return to Kealakekua Bay just a few days after he had departed. Such an unscripted surprise would render Cook "*hors categorie* … The abrupt reappearance of the ships was a contradiction to all that had gone before."[767] And this would seem to open the door to the contingency of interpretation taking root. Through a series of unfortunate events, Cook is killed. But "the killing of Captain Cook,"

Press, 2020), 72.

[765] For the fullest account, see Marshall Sahlins, *Historical Metaphors and Mythical Realities: Structure in the Early History of the Sandwich Islands Kingdom* (Ann Arbor, MI: University of Michigan Press, 1981); Marshall Sahlins, "Captain Cook at Hawaii," *Journal of the Polynesian Society* 98, no. 4 (1981). For the larger conceptual implications, see Marshall Sahlins, *Islands of History* (Chicago: University of Chicago Press, 1995), especially chap. 5. See also Reed, *Interpretation and Social Knowledge*, 25ff.

[766] Sahlins, *Historical Metaphors and Mythical Realities*, 20.

[767] Ibid, 22.

Sahlins insists, "was not premeditated [but] neither was it an accident."[768] It instead involved the construction of a potentiality just enough to gamble upon and *work*. The situation in question might still involve the contingency of interpretation, but we should be so quick to associate interpretation *with* contingency. The latter appears to vary inversely with some preparatory initial conditions and therefore with the presence of expectations, which in this contest were rigorously maintained by the priests of Lono.[769] With his unplanned, and unexpected, return to the islands, Cook's divination was essentially preordained, which means that this could be a moment for a "mythical reality," something that could "annul the possible effects of historical factors," or in probabilist terms, that could tame chance.[770] This case suggests something more like the *inverse* of the contingency of interpretation as such, so rooted is it in expectation. If it was a contingent interpretation that directed events, we should not expect it to offer such a buffer to historical change; it would invite chance rather than tame it.

Cook's apotheosis is a case of interpretation made differentially *probable* or *improbable*, and how, given the certain configuration that Sahlins documents, it *could* loop in and lead from surprise to expectation. Such an appraisal, however, only holds water if we are willing to break the Procrustean dichotomy of interpretation and probability. A non-chaotic situation is one in which initial conditions are stable enough to allow for expectations, including the expectation that interpretation will matter (will be an adequate cause). There is still room for surprise, of course; the probability distribution created by a given factor or set of factors that we expect does not tend to bring about the entire *Spielraum*. The Cook scenario in Hawai'i was non-chaotic. Cook's appearing again on the distant horizon from Kealakekua, his nearing approach, and his landfall were not outside a range of possibility that had been constructed for many years. What it did was make the "objective gamble" of a particular "dialogue of sense and reference" (e.g. Cook is Lono), to use Sahlins' quasi-probabilistic words, objectively probable—a single-case probability had, in other words, become *expected*.[771]

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[768] Ibid, 24.

[769] The situation here is similar to the one articulated by Weber above, involving cheating card players. It is possible to cheat, as Weber argues, only because we can dissociate expectations from ourselves and other players, allowing us to know what others expect, and inferring that they know what *we* expect.

[770] It seems clear that when Sahlins uses the phrase "mythical reality," he is echoing Claude Levi-Strauss, according to whom myth tends to be more characteristic of so-called "cold societies," that don't allow for historical change by emphasizing continuity, as opposed to "hot societies" which are marked by historical change and discontinuity. These remain, however, abstract distinctions without spelling out their probabilistic dimensions. See Claude Levi-Strauss, *The Savage Mind* (London: Weidenfeld and Nicolson, 1966), 233-34. Sahlins, *Historical Metaphors and Mythical Realities*, 17ff.

[771] Sahlins, *Islands of History*, 149ff.

When we abduct from an observation toward a "generalizing tendency," then, we engage with *probabilistic features that actually pertain to the world* rather than being merely a token of our knowledge of it. Such a pursuit is formally similar to what Krisean probabilism advocates as searching for adequacy, which is what we would suggest Sahlins successfully does here in his "maximal interpretation."[772] For Timmermans and Tavory, the *pluralist* use of theory is essential for abduction because (on these terms) only with the benefit of *all* theory do we have the best chances of successful abduction. In this view, as with interpretivism, theory secures our observations. Yet, on this point, a probabilistic approach pivots from abductive analysis and, we believe, Peirce would too, by not making interpretation strictly independent of probability (as abduction implicitly seems to claim) but aligning them instead (as both Peirce and Weber argue).

From Surprise to Expectation

Considering Peirce, probabilistic analysis can begin with surprise, just as Tavory and Timmermans recommend.[773] But starting with surprise does not mean the analysis remains as open-ended as abduction implies, with its endpoint essentially secured by the interpretive facility with which we deploy our theory of choice. For Peirce, surprise is not an experience formed entirely from previous experience; it arises in combination between present experience and an accumulated past, in the form of an unreflected kind of forward-grasping, what Peirce typically calls "belief" but which serves more like what we mean by expectation.[774] Thus, surprise leads us forward rather than backward, though it depends on a reference through the past. Because a surprise is a reaction to an unexpected experience, we cannot *infer* a surprise, try as we might; surprises instead force themselves into our recognition, beyond our control, in a manner that enhances our sense of finitude. Because surprises defy our expectations, they will monopolize our attention, at least for a moment, which means they, above all, invite an abductive (or in PP terms "active") inference to make our expectations *fit*.

What Peirce seems to indirectly suggest, however, is important. If our expectations were already settled by pre-existing interpretative frames (or theories) the abductive process would not scramble our subjectivity in the particular way that it does. As he argues:

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[772] Reed, *Interpretation and Social Knowledge*, 28.

[773] Tavory and Timmermans, *Abductive Analysis*.

[774] Charles Sanders Peirce, "The Fixation of Belief," *Popular Science Monthly* 12, no. 1 (1877): 1-15.

> Examine the Precept in the particularly marked case in which it comes as a surprise. Your mind was filled [with] an imaginary object that was expected. At the moment when it was expected the vividness of the representation is exalted, and suddenly when it should come something quite different comes instead. I ask you whether at that instant of surprise there is not a double consciousness, on the one hand of the Ego, which is simply the expected idea suddenly broken off, on the other hand of the Non-Ego, which is the Strange intruder, in his abrupt entrance.[775]

Thus, surprise makes it apparent that our expectations are *Non-Ego*, or *not entirely our own*; they are more objective than they are subjective. When we expect regularity, and it is not there, we notice it, and we also notice that we did, in fact, *expect* something, even if we never noticed *that* before. Surprise only occurs relative to probabilistic expectations, in other words, and what it is an encounter with the real but unknowable—"chance" as Peirce called it.

Thus, our expectations cannot arise, nor can they change, solely via "contingencies of interpretation" that would put the onus on cultural frameworks bridging the gap between us and an inherently chaotic world. If surprise is the start of our analysis, and if we transform the surprise into "potential," then in the process we make a discovery about the (extra-personal) source of our expectations, about which we appear to lack a voluntaristic capacity to change. No matter how hard we try to expect something, our intentional involvement (the fact we, alone, *test* ourselves) undermines the effectiveness of what we *decide* to expect. Like "deciding to believe," we must somehow convince ourselves that we did *not* decide to expect whatever it is that we now expect. There are restrictions here, too, on "doxastic voluntarism."[776]

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[775] Charles Sanders Peirce, *Pragmatism As a Principle and Method of Right Thinking: The 1903 Harvard Lectures on Pragmatism*, edited by Patricia Ann Turisi (Albany: SUNY Press, 1997/1903), 160.

[776] Bernard Williams, "Deciding to Believe" in *Problems of the Self: Philosophical Papers, 1956-1972* (Cambridge: Cambridge University Press, 1973), 136-151. The question of doxastic (in)voluntarism has been subject to voluminous investigation by philosophers ever since Williams' classic proposal. A review is far beyond our scope here (though see Aku Visala, "Control Over Believing and Doxastic Voluntarism" *Frontiers in Psychology* 13 (2022): 929143), however we would position ourselves closer to Williams' involuntarism in large part because of the practical opacity with which belief-formation occurs when we understand it to be non-representational (see Michael Strand and Omar Lizardo, "Beyond World Images: Belief as Embodied Action in the World," *Sociological Theory* 33, no. 1 (2015): 44-70). Here, the same stipulations apply to "expectation" as they do to belief. To our knowledge there is not yet a philosophical conversation around doxastic voluntarism and expectation despite the fact that expectation-formation may be *more* involuntarist than belief-formation, particularly given the role of time for expectation.

Surprise, Peirce seems to be telling us, can lead us toward a generalizing tendency, to arrive at a recognition of *continuity* that makes the exceptional event into something we can expect. For Peirce, there is no other option: if our incomprehension is never pure, as it would be in complete nonrecognition, then it can only be partial.[777] There is a point at which abduction *stops*, in other words, which means that, as a form of learning, it resembles neither "permanent learning" continuous with every new data point, nor a meaningful hybrid of "theoretical and evidentiary" signification, as interpretivists claim.[778] Probabilism (as noted in Chapter 2) agrees with realists that interpretation does *not* extend "all the way down." *Pace* at least some versions of realism, however, probabilism does not recommend the *discontinuous* analytic practice of starting with experience, which is always informed by probabilistic judgment or guessing, and translating it into mechanisms and structures that exist only as "causal powers."[779] The recommended approach is, instead, more like a cartographic mapping of what is "out there" in the form of generalizing tendencies or *Spielraum* whose potentials we make "actual" through action, even when they surprise us.

In this case, abductive knowledge is understood to be *objective*, or "continuous" in Peirce's words; it is about a world (*a parte objecti*) that exists, but in the form of probabilities instead of meaningless chaos or deterministic powers. If we do not give an account of what allows us to *stop* abducting, then we, by default, commit to the "contingencies of interpretation."[780] This might work if theory and probability were as naturally opposed as the Comtean divide makes them. But, as we have suggested (see Chapter 1), for one who engages in probabilistic reasoning, general concepts and statistical calculations cannot help but *both* stand as descriptions of objective probabilities. Social theory can help us perform abduction, with stakes rooted in meaning; yet the use of theory in human science does not engage with what *lacks* meaning or with what exists as causal powers that cause our experience while remaining impervious to our judgment. Objectively speaking, social theory engages with what we have described as generalizing tendencies (with potentials) or, in the same manner, as probabilistic orders (with adequate causes) about which *expectations* are the primary stakes.

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[777] "…[I]rregularity does not prompt us to ask for an explanation. Nor can it be said that it is because the explanation is obvious; for there is, on the contrary, no explanation to be given, except that there is no particular reason why there should be a regular pattern … I mention this to show that, so far is mere irregularity a motive for demanding an explanation, that, even when there is a slight reason for expecting a regularity and we find irregularity, we do not ask for an explanation, where as if it were an equally unexpected *regularity* that we had met with, we certainly should have asked for an explanation. I am, for reasons similar to this … confident that mere irregularity, where no definite regularity is expected, creates no surprise nor excites any curiosity." Charles Sanders Peirce, "On the Logic of Drawing History from Ancient Documents, Especially from Testimonies," *The Essential Peirce, Volume 2: Selected Philosophical Writings (1893-1913)*, edited by the Peirce Edition Project (Bloomington, IN: Indiana University Press, 1998/1901), 88. See also Mark Bauerlein, *The Pragmatic Mind: Explorations in the Psychology of Belief* (Durham, NC: Duke University Press, 1997).

[778] Isaac Arial Reed, *Interpretation and Social Knowledge: On the Use of Theory in the Human Sciences* (Chicago: University of Chicago Press, 2011), 113.

[779] Douglas Porpora, *Reconstructing Sociology: The Critical Realist Approach* (Cambridge: Cambridge University Press, 2015), 59ff.

[780] See the discussion below: "Coda: The Mark of Probability."

Theory in a Probabilistic Mold

As we discussed (see Chapter 3), Hacking traces the "taming of chance" across a series of 19th century figures (Quetelet, Poisson, Nietzsche) as "the way in which apparently chance or irregular events [were] brought under the control of natural or social law. The world became not chancier, but far less so."[781] To tame chance meant (and still largely means) doing statistical calculations by creating classes, drawing analogies, and counting frequencies. Irregular events, sudden occurrences that appear as random eruptive instants, are recast as probabilities or improbabilities. Our expectations change as we are no longer confronted by single events, but larger classes of events about which probability distributions can be assigned.

Peirce presents us with a different, non-statistical probabilism. What surprises us is a partial sign of a continuum that, like a mysterious mark on a chalkboard later filled in by others, leads us to engage in probabilistic reasoning, making inferences toward objective probability, leading us to ask what practical factors might tame chance by creating generalizing tendencies and probabilistic order? If we cannot loop into anything, ultimately, at the opposite end, then in that case the taming of chance creates the possibility of inviting chance in, *à la* the Babylonian lottery, tearing down the taming forces, engaging in the deliberate creation of games of chance. The failures of taming chance also become noticeable alongside our expectations of things as "less chancy" in general. An expectation makes events into more than instantaneous creations; they become partial signs and predictive associations, given duration by expectations about what should come next and what must have come before.

If statistical analysis has become the primary tool in the effort to tame chance, it is far from the only tool. According to Hacking, an essential chapter in the genealogy of probability is not the appearance of statistics, but the shift of partial signs from dubious pursuits like alchemy into scientific respectability.[782] On these grounds, probability is not alone in reading what appears like tea leaves *meant to be read*. Theory, too, tries to read partial signs and tame chance. Statistical calculation has successfully campaigned to make theory stand the test of statistics rather than the reverse.[783] Yet, theory does not need statistics to be probabilistic; it does not need statistics to be *tested*. Social theory is interpretivist and meaning-making in cases where orientation via concepts is all that is available, where there is no generalizing tendency or probabilistic order we can loop into; this most approximates a condition confronting the world as meaningless chaos. This should not lead us to overlook different approaches which, following Peirce and Weber, do not assume the need to bridge a meaning gap between us and the world as much as they allow us to envision its role in taming chance and making partial signs continuous or generalizing (e.g., adequate). Pulling from their insight, social theory becomes a tool for looping in and forming/changing expectations.

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[781] Hacking, *The Taming of Chance,* (Cambridge: Cambridge University Press, 1991), 10.

We can demonstrate this point using a famous use of social theory from the classical past. In his analysis of theory as an interpretive meaning system, Reed refers to the following passage from Karl Marx's 1852 pamphlet *The Eighteenth Brumaire of Louis Napoleon Bonaparte* as a textbook demonstration of a "maximal interpretation" that takes a phenomenon, in this case a historical event, the French Revolution, and joins "theoretical signifiers [with] evidential signifiers to produce new social knowledge" of it.[784]

> When we think about this conjuring up of the dead of world history, a salient difference reveals itself. Camille

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[782] "...[O]ur idea of probability is a Janus-faced mid-seventeenth century mutation in the Renaissance idea of signs. It came into being with a frequency aspect and a degree-of-belief aspect. In the early days one could be indifferent as to the two directions in which probability might lead one," ibid, 96-97. This becomes apparent, for instance, in both Thomas Hobbes' *Leviathan* (1651) and the Port-Royal Logic (1662) in their mutual concentration on "conventional signs." See Hacking, *Emergence of Probability*, chap. 5

[783] Hacking (ibid, 36) follows Foucault's earlier claim more or less exactly: "It is no longer the task of knowledge to dig out the ancient Word from the unknown places where it may be hidden; its job now is to fabricate a language, and to fabricate it well—so that, as an instrument of analysis and combination, it will really be the language of calculation ... It was this system that introduced into knowledge probability, analysis, and combination, and the justified arbitrariness of the system," Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York: Vintage, 1970), 61ff. Randall Collins would make a similar observation in claiming that statistics remains unable *not* to reveal its theoretical cards. Statistical methods at this time—especially LISREL-based structural equation modeling—consisted of "a substantive theory of how chance processes operate in the world." More specifically, these methods make assumptions about how probability is objective by assuming that what makes probability objective mirrors the needs of assigning a quantitative measure of probability to events recorded by way of frequency. Randall Collins, "Statistics Versus Words," *Sociological Theory* 2 (1984): 329-362, quotation is on p. 331. See also Carlo Ginzburg, "Morelli, Freud and Sherlock Holmes: Clues and the Scientific Method," *History Workshop* 9 (Spring, 1980): 5-36, especially p. 20-21;

[784] Reed, *Interpretation and Social Knowledge*, 30.

> Desmoulins, Danton, Robespierre, St. Just, Napoleon, the heroes as well as the parties and the masses of the old French Revolution, performed the task of their time—that of unchaining and establishing modern bourgeois society—in Roman costumes and with Roman phrases. The first one destroyed the feudal foundation and cut off the feudal heads that had grown on it. The other created inside France the only conditions under which free competition could be developed, parceled-out land properly used, and the unfettered productive power of the nation employed; and beyond the French borders it swept away feudal institutions everywhere, to provide, as far as necessary, bourgeois society in France with an appropriate up-to-date environment on the European continent. Once the new social formation was established, the antediluvian colossi disappeared and with them also the resurrected Romanism—the Brutuses, the Gracchi, the publicolas, the tribunes, the senators, and Caesar himself. Bourgeois society in its sober reality bred its own true interpreters and spokesmen in the Says, Cousins, Royer-Collards, Benjamin Constants, and Guizots; its real military leaders sat behind the office desk and the hog-headed Louis XVIII was its political chief. Entirely absorbed in the production of wealth and in peaceful competitive struggle, it no longer remembered that the ghosts of the Roman period had watched over its cradle.[785]

As Reed argues, the theoretical signifiers in this passage ("modern bourgeois society," "unfettered productive power," "social formation," "free competition," "production of wealth") combine with stylistic turns of phrase ("cut off the feudal heads that had grown upon it"), and draw together evidential signifiers (who did what, when, where, how). The resulting assemblage provides answers to the "why and wherefore questions" of the famous event.

But suppose we bracket the interpretivist claim that Marx's analysis provides both reader *and* writer (Marx) with a demonstration of "the signs and symbols that humans use to make meaning."[786] What if Marx's argument is not fundamentally different from the taming of chance? To understand Marx's interpretation, we would have to find the probabilistic order toward which Marx himself was oriented, in which the expectations that *could* be derived from the French Revolution(s) of both 1793 and 1848, events that in eliciting surprise, carried high stakes.[787] Marx's memorable words and phrases would then appear *improbable* relative to more typical interpretations (and words) associated with the French Revolutions; in particular Marx's claim that the first revolution spawned a second, that the "the Montaigne of 1793 to 1795" was followed by the "Montaigne of 1848 to 1851," and that a "tragedy" has been followed by a "farce." Marx does not simply want to deconstruct a typical interpretation and the expectation it creates; he still wants to tame chance and create expectation, only in a different way. For this, he enlists different conceptions of order, in which both Revolutions, particularly the farcical second, should come as no surprise.

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[785] Karl Marx, "The Eighteenth Brumaire of Louis Napoleon Bonaparte," in *The Marx-Engels Reader*, edited by Robert Tucker, (New York: Norton 1972/1852), 595.

[786] Reed, *Interpretation and Social Knowledge,* 33.

[787] The probabilistic order in question involved the French Revolution of 1848, of which the *Brumaire* is written as a position piece, and which the stakes involve the direction that a now submerged French revolutionary tradition, reeling from (the nephew) Bonaparte's coup, would take thereafter. Comte and Alexis de Tocqueville also took positions in the same probabilistic order, which has subsequently proved consequential for expectations about future revolutions; see Craig Calhoun, "Classical Social Theory and the French Revolution of 1848," *Sociological Theory* 7, no. 2 (1989): 210-225.

For us, the readers, then, the *Brumaire* helps us navigate a world of chance. Marx's interpretation of the French Revolutions remains improbable relative to those probabilistic orders for which such interpretations, particularly of the first French Revolution, *still* have stakes and create expectations, making partial that which also affords *oppositional* political opportunities by inviting chance in the closed ("orthodox") spaces that need the events of 1793 (and 1848) to have a settled interpretation.[788] Marx tames chance by deploying his "theoretical signifiers," which are still in development at this point. Eventually, they will become touchstones for making surprising or "accidental" (Marx's preferred word) events into indications of "what is coming next" (for better or worse), and this presupposes an orientation to a probabilistic order, or generalizing tendency, as a space of partial signs, that either lacks authoritative signs or for which irregular (unexpected) events *continue* to elude the interpretations claiming to be authoritative.

None of Marx's theoretical signifiers would provide the basis for an expectation if they did not do one specific thing: namely, recreate the expectations present during the event in question. In this case, the orientation toward *liberté, égalité, fraternité* wanes in comparison to an orientation toward capitalism (e.g., "the production of wealth and peaceful competitive struggle"). The farcical second revolution defies what we would expect if 1848 were typical according to a more liberal interpretation of 1793. Marx enlists his unique bank of concepts to demonstrate this point and reconstruct the "second Montaigne" so that the people involved do what is typical, regardless of how surprising. If Marx's concepts did not loop in here, and by doing so, recover expectations, then the event in question would still be comprehensible. A meaning of 1848 would still become objectively probable, but only as an analyst's interpretation, distant from the scene and outside a constructionist loop, and so unburdened by *needing* to create expectations.[789] To the degree that Marx's concepts provide a point of access to expectations that we would not otherwise have, they make it possible to glimpse a constructionist loop in action, as expectations meet objective chances, in this case, as Louis Napoleon and his lackeys seize an opportunity for *coup d'état* in 1851—unexpected if the "colossi" of 1793 still our held attention, though all too expected should the high-minded orientation of 1793 have been so completely dissolved by this point by its own liberation of capital.

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[788] Francois Furet, *Interpreting the French Revolution* (Cambridge: Cambridge University Press, 1981); William Sewell, "Historical Events as Transformations of Structures: Inventing Revolution at the Bastille," *Theory and Society* 25, no. 6 (1996): 841-881.

In the probabilistic mold, then, theory is interpretation, but rather than an analyst's interpretation, theory tames chance because it creates expectation.[790] This is what we can expect from the French Revolution, this is what the French Revolution comprises, these are its adequate causes: any perspective can only be probable and never entirely settled. But because they have stakes because how the partial signs of *this* event are made continuous or objectively probable serves to construct other probabilistic orders, it matters what it makes the *most* sense to say about the French Revolution. Marx's interpretation, in "resignifying" the French Revolution, alters objective chance.

Steps Toward a Probabilistic Method

On these grounds, we make a few proposals towards a probabilistic method, to be fleshed out in what follows. As we have suggested, what is notable about probabilism in comparison to the frequentism that largely dominates conversations around probability in sociology is that *even a single case* manifests probability; we do not need to make frequency counts for probabilities to *become* manifest, nor do we need an experimental set-up (and variable relations). As this implies, the task becomes to find objective probability in an actual arrangement, explain why the probabilities it manifests (makes actual) are its tendencies, and explain what could happen in "the long run." As mentioned above, these lessons can apply to probabilistic reasoning *writ large*.[791] Yet, applied in sociology, several specifications become necessary. This particularly applies to the role of social action, as Weber and Bourdieu both emphasized above all, the distinction of adequacy and chance, varieties or types of probabilistic orders allowing for analogical reasoning between them, and the very phenomenon of repetition.

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[789] This point can be reflected in the difference between learning and knowledge according to Deleuze: "Learning is the appropriate name for the subjective acts carried when one is confronted with the objectivity of a problem … whereas knowledge designates only the generality of concepts or the calm possession of a rule enabling solutions." *Difference and Repetition*, 204.

[790] Some strains of ethnomethodology have tread here before us (not infrequently the case), particularly the groundbreaking work of D. Lawrence Weider. Yet, in respect to Weider, a probabilist will argue that expectations are *not* maintained by social sanction and perception independently of a looping relation to objective chance. "Role expectations," in this case, simply refer to a specific looping effect and, as such, cannot be the causes of themselves. See D. Lawrence Weider, *Language and Social Reality: The Case of Telling the Convict Code* (The Hague: Mouton, 1973), especially p. 216.

> (1) Sociologists should capture the range of possibilities that correspond to what they observe as definite, actual arrangements. Statistical analysis is one way of doing this. But to do this in a way that avoids a nominalist trap, the range must not be our singular construction. We must, instead, find this range (or continuum) as *orientations in social action*.
>
> (2) It is possible to make inferences about probabilistic order by modeling them as probability structures, specifically to capture the effect of how much or how little they leave to chance. These inferences replace the model of the proposition with that of judgment within ranges of possibility that can be brought to bear in relation to definite arrangements or a single designated entity. Three major types of probability structure include *games of chance*, *fields*, and *apparatus*. Effectively, these probability structures situate all numerically distinct designations within a continuum according to the relative presence or absence of chance. On these grounds, we can engage in analogical theorizing between specific empirical settings that are not otherwise related.
>
> (3) A probabilistic method must account for duration and objective probability by finding adequate causes. An adequate cause will either construct a range of possibility or establish subjective expectations that orient and loop into it via judgements of probability. *Accounting for the loop,* we argue, is a main prerogative of a probabilistic method, as we expand upon further in the next chapter. This does not have to be limited by micro or macro concerns, nor by qualitative or quantitative distinctions. Rather, all probabilistic orders are defined by their "area of expectations" and the extent and duration of the orientations that can be secured by

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[791] See, for instance, Suárez, "Propensities and Pragmatism" and *Philosophy of Probability and Statistical Modelling* (Cambridge: Cambridge University Press, 2020) for similar arguments that leverage Peirce's probabilism.

tests.

Beyond Quantitative and Qualitative

For probabilistic sociology, the variable relations revealed by statistical models serve as *indexes* for how probability has been made objective. This means that predictive variables give evidence not of a direct link with a dependent variable ($X \rightarrow Y$) but of elements of (historically specific) tests and risks, as these refer to the presence of objective probability. Thus, as statistical tests *can* mimic the tests that, as we have argued, order a probabilistic social world, we can also observe probabilistic orders coming into being through engagements with non-specified chance. This suggests that rather than focus on variabilities, the role or this or that key factor in explaining variation, we are really taking observations on *orientations to chance*, how chance takes form in probabilistic orders, and how vertical forms of capture leave a subjective trace in expectations and judgments made clear in patterns of action observable across time. We can find both quantitative and qualitative examples of these points, though as we have suggested, probabilism recommends that sociologists will have to drop these designations in all but name only, by appreciating that whatever we analyze, it has a probabilistic dimension.

Take the following claim: "African American jobseekers … need to utilize roughly twice as many network contacts as white jobseekers to accrue the same labor market benefit."[792] The labor market benefit here indicates an outcome (likelihood of receiving a job offer, an interview, a screening call) of job search and hire as a *mode of trying*, and how network contacts serve to resolve this *test* (as a potential resistance and uncertainty) into an outcome. The different probabilities indicate how this objective probability is racialized specifically via "network returns": "conditional on hearing about an opening through a network-based channel, Black jobseekers are less likely than white jobseekers to (1) know someone at the companies to which they are submitting applications, and (2) have their network mobilize key resources on their behalf, specifically contact an employer on their behalf."[793]

On both ends, *risks* are centered in outcomes, as potential unemployment has been made *into* an outcome for potential employees, who are defined by a distribution of chances. Thus, once we introduce variables into a testing space, with uncertainties and randomness that must be absorbed, we find both an opening of possibilities ("continuum") but also an unequal distribution of chances ("definite arrangement"). The variables index the range of factors and their differential impact in shaping the test space as people move through it, shaping objective chances and expectations. A sign of the constructed outcome is *illusio*, or uncertainty that takes form as motivation and is anchored in specific *stakes*. In this case, we observe the *illusio* to use network contacts for job search and job application without a second thought. The *capital* of white jobseekers shapes the field (space of objective probability) of job search and hire by linking objective probability (e.g., *power* over potentially resistant outcomes) more closely to expansive network contacts. This becomes a way to realize certain (desirable) potentials opened by the testing space. None of this would become objective, however, if employers, as the source of potential resistance, did not resolve their own uncertainty by making predictions according to network contacts, which turn out to be racialized.[794]

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[792] David Pedulla and Devah Pager, "Race and Networks in the Job Search Process," *American Sociological Review* 84, no. 6 (2019): 983-1012, quotation is on p. 996.

[793] Ibid, 1007.

This attempts to situate probability directly into action by appreciating the fact that because job search and hire is a testing space, based in this case on the invitation of chance, analysts are not alone in confronting uncertainty and *expecting* that "results" are not random either. Alternatively, this space could be an apparatus (determinism) or a game of chance (randomness), in which case there would be either *no* uncertainty or near *complete* uncertainty at every moment. Because this space of objective probability *exists*, a statistical model can index its properties; more significantly, sociologists can interpret social action by finding probability-in-action (as *habitus*), specifically as a (measured) *chances*- (learned) *expectations loop*. Thus, to find an $X \rightarrow Y$ relation as a probabilistic statement does not require that social action be understood as any less probabilistic than the statement itself.

For probabilistic sociology, the argument that statistical models can index the properties of objective probability (e.g., *how* probability is made objective) carries a further implication (and inference) toward a history and mode of *inviting* chance in and/or *taming* it. This dialectical tension (*invite* ←→ *tame*) is critical for an explanation that can scale up to an aggregate $X \rightarrow Y$ variable relation and remain continuity down to probabilistic social action, though it does not have to be by design. More generally, it suggests *institutionalization* as a taming of chance by the future-controlling effects of *capital* and the creation of rhythms in modes of trying in a situation that invites chance in but not so much as to become a game of chance. Just as the classical probability theorists understood, objective probability can seem random for those who have not learned its probabilities and cannot anticipate them or be motivated by or orientated to them (as *illusio*). Much like the denizens of Borges' fictional Babylon, who live in circumstances in which chance has been invited into *everything*, what happens next is neither probable nor improbable, expected nor unexpected, and therefore not a form of justice or injustice, signifying neither equity nor inequity. There are not analogies to drawn or connections that can be made. What happens next is simply something that happens next.[795] "Objective potentialities" can be statistically measured as "average chances" that reveal how much chance has been invited in or tamed, how much these potentialities serve the accumulation of capital, and how settled or maintained are the "outcomes."[796]

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[794] Ibid, 1008.

Furthermore, for a probabilistic sociology probability can be *qualitatively* understood as part of social action and experience, and this does not require a strong distinction from its statistical measurement (as if probability could play no direct role in action). Contrary to any reification of reality as a "data structure," statistical measurement does not tell us how probability becomes objective. This requires a secondary inference, but one that does not leave probability behind (as merely epistemic). Rather, an "estimation of chances" finds its way into action as the "transformation of … past effect into an expected objective."[797] These schemes make "social space" as real as "physical space," not as fixed entity variables, averages, correlations and predicted effects (or as structures reified on these grounds), but as a *qualitative physiognomy* rooted in *chances-expectations loops* as "hope" or "foreboding," "danger" or "possibility," "open paths" or "blocked horizons." For probabilistic sociology, "average changes" are important not as objective reality but as secondary inferences toward the probabilistic schemes (e.g., Future → Past → Present) but as secondary inferences toward the probabilistic schemes (e.g., Future → Past → Present) that wager on a future with these potentialities and the corresponding tests and risks.

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[795] As Pascal argued, fair stipulations of a game or enterprise featuring a risk of initial investment could be specified as something like the following: "The regulation of what should be theirs must be so proportionate to what they could justifiably expect from fortune, that it's a matter of indifference to them whether they take what is assigned or continue with the luck of the game." See Alain Desrosières, *The Politics of Numbers: A History of Statistical Reasoning* (Cambridge: Harvard University Press, 1998), 49.

[796] Pierre Bourdieu, *The Logic of Practice* (Stanford: Stanford University Press, 1990/1980), 290 n2.

[797] Ibid, 53.

This suggests that the appearance of a field as a space of objective probability serves to vertically *orient* social action through a chances-expectations loop. More generally, this suggests social change that occurs through some means of inviting chance into a space (of objective probability or determinism) that has already tamed it in a certain way or is otherwise teeming with chance mechanisms not yet made objective, thus enabling new forms of capital to appear as a new power over the future. This could also occur through the introduction of new capital into a preexisting loop, thus changing expectations and how probability is continuously made objective.

In Javier Auyero's *Patients of the State*, the denizens of Buenos Aires are subject to a dynamic of power that specifically revolves around the creation, alteration, and maintenance of expectation via the auspices of both taming chance and inviting it in.[798] As Auyero studies the waiting room of the main welfare office in Buenos Aires, whose visitors include immigrants apply for identification cards and dwellers in the city's vast *barrios* seeking to be allocated housing in another part of the city. The typical experience of the waiting room is what Auyero describes as the manufacture of "uncertainty and arbitrariness." As one visitor describes it: "I came two weeks ago; they told me to come back in three days. I came back and the office was closed. I returned the next day, and they told me there were no funds in the program. Today I need to get paid."[799]

"Repeated waiting" draws Auyero's attention in this space as a surprising regularity, and yet as the ethnography unfolds, we learn that is not a surprise for those who do the waiting. It is all too clearly something to be expected. Auyero draws from Franz Kafka's *The Trial* to analogize this particular test space, which like Kafka's "trial" is characterized by "persistent confusion and misunderstanding."[800] The *illusio* of the welfare office, the transformation of uncertainty into motivation, often in the form of hope, does not stray far from the outcome that arises in this setting of constructed duration: specifically, the outcome of whether (and when) one finally meets a representative of the state on the other side of the desk who can offer needed help. As Auyero documents, the probabilistic order of the waiting room is a demonstration of political capital, as the Argentinian state's control over the future; but if, as vertically captured the state, the specific dynamics observable in the waiting room, the way in which chance is both tamed and invited in, creates unpredictable rhythms, it also serves to generate another capital more immanent to the situation itself.

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[798] Javier Auyero, *Patients of the State: The Politics of Waiting in Argentina* (Durham, NC: Duke University Press, 2012)

[799] Ibid, 19-20.

[800] Ibid, 72.

Patience becomes the means with which to reduce (unpredictable) error and gain some modicum of control over the future by making certain outcomes, created by the test of waiting, objectively possible. What Auyero observes as "repeated waiting," then, is patience in action, in direct relation to the distinct testing space of the welfare office waiting room. Both Auyero and those who wait find patience to be the key variable (e.g., a "selected" potential) that can tame chance in this situation, as reflected by the distribution of chance in the constructed outcome. With patience as its capital, the waiting room also serves as a venue for creating other futures, through knowledge-sharing and building social capital, which, as Auyero alludes to, could itself become a source of (disruptive) chance relative to what is otherwise expected in the local political field.[801]

Thus, typically quantitative or qualitative approaches can both demonstrate probabilistic aspects and a corresponding genetic series. There is a kind of unity of sense available here, if we only get past the dichotomy that assumes that probability cannot be examined for serious purposes outside of statistical analysis. Not only is this antiquated, but probabilities demonstrated statistically are not *merely* in our analysis; they index probabilistic aspects that literally pertain to the world. What Auyero's case demonstrates, in the same manner, is an orientation to chance as it takes form in a distinct probabilistic order, with objective chances and expectations made empirically inspectable using qualitative methods.

Analyzing Historical Change

The conceptual incorporation of probability makes a meta-methodological difference for methods by finding probabilistic grounds for a continuity between qualitative and quantitative approaches. What is distinguishable about both of the above examples is their present-time orientation, which in probabilistic terms means they examine a probabilistic order already in formation, which has obtained duration (via repetition), and they diagnose its order-making. Arguably, historical sociology or genetic "formation stories" are the most removed from probabilistic concerns.[802] So can a probabilistic method account for the appearance of probabilistic orders and orientations to chance as they emerge in history?

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[801] Ibid, 154.

[802] Daniel Hirschman and Isaac Reed, "Formation Stories and Causality in Sociology," *Sociological Theory* 32, no.

A probabilistic sociologist like Bourdieu distinguishes two ideal-typical ways of thinking about orientations to probability and what they mean for social change.[803] One is a "Cartesian" discontinuist model emphasizing *transcendental* radical ruptures, revolutions, and structural breaks with the past. The other a "Leibnizian" continuist model emphasizing the *immanent* tendencies for groups, fields, and the like to perdure in time as if the "social world…[carried] within itself the regular and regulated source of its own continuity."[804] From this perspective discontinuity emerges as an aberrant state, most clearly isolated in the purely random setups of games of chance, which, by design, break continuity by making the outcomes of each trial statistically independent (if indeed "fair") of one another. This gambling vision is thus "very well incarnated in roulette, the game where there is no link between successive games; at every spin of the wheel you can win or lose everything."[805]

The allusion here is no accident. After all, a favorite persona in the probabilistic sociological imagination is, in fact, that of the *gambler*.[806] Such a figure illustrates that whether the social world itself is perceived as continuous or discontinuous depends on our predictive relationship to it: the possibilities we find as real. We can imagine the scenario in which, as in Fyodor Dostoyevsky's *The Gambler*, an actor becomes solely oriented to games of chance, and indeed transposes this orientation into every situation.[807] The same principles apply when the instantaneous transformation promised by magic becomes appealing. Like games of chance, which lack history, magic promises a quick route to complete upheaval in objective probability. Gamblers revel in discontinuity. But alas, the social world is not roulette, and only approximates roulette-like conditions in states of radical revolutionary rupture or moments of crisis.

One key principle for historical examinations of chance processes is that chance mechanisms that appear unexpectedly are made objectively possible when people find an orientation to them.

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4 (2014): 259-282.

[803] Pierre Bourdieu, *Forms of Capital: General Sociology, Volume Three* (Lectures at the College de France, 1983-84), translated by Peter Collier (London: Polity, 2021/1983-84), 129.

[804] Ibid, 128.

[805] Ibid, 129.

[806] Ibid, 128; Weber, "Some Categories of Interpretive Sociology," 160-61.

[807] Fyodor Dostoyevsky, *The Gambler and Other Stories,* edited and translated by Ronald Meyer (New York: Penguin, 1866/2010).

Thus, while a range of factors might be credited with creating an objective chance, they will not come to fruition, or become social reality, unless they gain people's orientation, which means that they become a source of expectations, risks, opportunities (etc.) all of which give the objectively created chances their subjective presence. Meanwhile, the appearance of what is formally akin to *guessing* at an objective chance means finding an orientation unknown to all but the guesser (and perhaps guessing wrong). The orders that appear in history are looping probabilistic constructions between expectations and chances, in which we observe social action that comes to tame chance by continually reducing the presence of unexpected "errors." But just as social action becomes oriented in this manner, so too can the orientation be lost, or chances expected disappear.

Consider, then, the following example. The history of capitalism has been a topical concern for scholars arguably ever since capitalism has been said to exist. Of those accounts, many focus on the range of historical factors (discovery of "the new world," influx of bullion, imperial expansions, the Black Death, etc.) that add up to the appearance of capitalism, while a comparative few attempt to account for something like an orientation to capitalism.[808] The particular difficulty with the latter is that any such account seems like a diffusionist model, in which the real source of chance has only *one* source (generally, a Eurocentric one) that makes its way across the world, rather than being itself a reflection of connections across the world that make it a single "definite arrangement" within a broader "continuum" of possibility. Should we approach the problem probabilistically, we can bracket any latent distribution of credit (or blame) by instead making the analysis mark only the occasion of a *loop* in time and place, and far from the only *possible* one.

In one analysis of a case of the genesis of capitalism, the historian Robert Brenner starts with what he describes as a surprising regularity or rhythm, a "self-perpetuating dynamic" that arises in the countryside of 17th century England. As entirely unintended, it consists of the appearance of a new kind of objective probability.[809] For Brenner, the problem with other histories of capitalism is that they assume what they need to explain, specifically the material interest in systematic extension and continuous economic growth.[810] In Brenner's narrative, by contrast, the broader objective factors are not ignored, but emphasized above all are contextual factors that create a distinct *Chance* of capitalism in 17th century English agriculture, defined as a looping in of subjective expectation to objective probabilities that become apparent as distinguishably capitalist interests. English peasant resistance in the late medieval period had ended serfdom, thus contributing to the adoption by the landholding elite of less coercive measures of control, like monetary rent. The peasants could not, however, stop the landlord consolidation of an absolute property right (against state, church and custom) through enclosures. It would be through this combination of rent and consolidation that a new position in class relations would appear: the *capitalist tenant*. This tenant was particularly subject to a novel "self-perpetuating dynamic" in which, as tested by landlords to pay escalating rent dues, had to produce enough and efficiently enough under a variety of leasehold arrangements, which translated into heightened exploitation and control of labor.[811] This novel field of class relations leads Brenner to make the following point:

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[808] For an overview, see Rebecca Jean Emigh, "Transitions to Capitalisms: Past and Present," *The Sociology of Development Handbook* edited by Gregory Hooks (Berkeley: University of California Press, 2016), 577-596.

[809] Robert Brenner, "Agrarian Class Structure and Economic Development in Pre-Industrial Europe," *Past & Present* 70 (1976): 30-75. See also Robert Brenner, "The Agrarian Roots of European Capitalism," *Past & Present* 97 (1982): 16-113; C.H.E. Philpin and Trevor Aston (eds) *The Brenner Debate* (Cambridge: Cambridge University Press, 1985).

> The original onset of modern economic growth depended upon the transition from pre-capitalist to capitalist property relations. But this outcome is inexplicable in terms of the rationally self-interested actions of pre-capitalist individual economic actors or classes: it must be understood as an unintended consequence of the actions of individual pre-capitalist actors and especially the conflicts between pre-capitalist classes.[812]

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[810] Robert Brenner, "The Origins of Capitalist Development: A Critique of Neo-Smithian Marxism," *New Left Review* 104 (1977): 25-92.

[811] Brenner, "Agrarian Class Structure," 63-64. The middling position of the capitalist tenant, who, by objective chance, found themselves playing this role, is also suggested by Marx:

> [The rise] of industrial capitalists, these new potentates, presents itself as the result of a victorious struggle both against seignorial power, with its revolting prerogatives, and against the regime of the guilds, with the fetters it placed on the free development of production and the free exploitation of man by man. But *the knights of industry only supplanted the knights of sword by exploiting events not of their own making*. They have succeeded by means as vile as those that served the Roman freedman to become the master of his patronus (*Capital*, 875, emphasis added).

Thus, the capitalist tenant, in being tested within this novel position, effectively puts land together with labor after the dissolution of serf proprietary rights and controls, though now under entirely different auspices. We might say the tenants were supreme opportunists, though the opportunity first had to be created (and they did not create it). See also Etienne Balibar, "The Basic Concepts of Historical Materialism" in *Reading Capital: The Complete Edition* (London: Verso, 2016/1968), 448.

[812] Robert Brenner, "The Social Basis of Economic Development" in *Analytical Marxism,* edited by John Roemer, (Cambridge: Cambridge University Press, 1986), 26.

In his analysis, Brenner argues that ingredients for capitalism arise from the moment when reproducing oneself materially up and down the class structure becomes tied to this kind "self-expanding tendency" that secures the surprising material interest that, in probabilist terms, calls upon specific way of reducing error and difference in a manner that, over a duration, means a dynamic of growth and accumulation, without needing explicit rules. In this case, the *Chance* of capitalism was not initially specifiable as a conception of order; this only came when the same partial signs that were subject to practical "error reduction" became subject to rationalizing centers and orientations toward unique possibilities in thought.[813]

The "necessity of producing for socially necessary labor time in order to survive, and to surpass this level of productivity in order to ensure continued survival," is abstract in comparison to direct coercion, and as Brenner describes this, we can locate expectations that loop into objective probability as they are vertically captured.[814] The "market" is a point of orientation for social action, which calls upon and organizes certain traits and bodily capacities for a performance, making those traits *less* particular or individual. To buy or sell on a market is less contingent on "ends and means consciously chosen as 'adequate.'"[815] In that case, action is more strictly horizontal, featuring more biographical variability and subjectivity, making it less regular and more unpredictable. Action can be strictly instrumental rather than typical and "objectively correct," which reduces particularity and subjectivity, allowing us to speak *generally* about the action we observe, that it has a dynamic or unique *"rhythm*," for example, as a repetition is born.

The microcosm of 17th century English agriculture Brenner dissects is simply the distillation of a probabilistic judgment unfamiliar in this context but familiar through the looking glass of the present. The problem is that we cannot generalize the orientation we find here, given the particularities of the context that do not repeat everywhere. Stated otherwise, these orientations are *improbable* when we look elsewhere. Within capitalism's range of possibility, there are *more* orientations toward its objective chances, featuring different tests and risks, beyond a responsiveness to the escalatory pressures of market production. Stuart Hall, for instance, makes this point in arguing that a deterministic kind of "guarantee" that might be read from Marx's own account of capitalism would lead us to overlook different orientations, some of which do not look anything like those documented by Brenner, not least because they frequently do coincide with a violent (e.g., "extra-economic") sanction. Here he echoes Cedric Robinson's argument for a "nonobjective" history of capitalism that would center its dependence on racial domination. If the objective chances for wealthy whites in northwestern Europe find orientations such as profit-making, the same orientations are not typically available to people of color, particularly enslaved Blacks, when their orientation to capitalism cannot typically be separated from an orientation toward survival and safety from overt violence.[816]

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[813] See Gareth Stedman Jones, *An End to Poverty? A Historical Debate* (New York: Columbia University Press, 2004). See also, Ellen Meiksins Wood, "The Separation of the Economic and Political in Capitalism," *New Left Review* 121 (1981): 66-105, especially p. 86.

[814] Brenner, "Origins of Capitalist Development," 32.

[815] Max Weber, "Some Categories of Interpretive Sociology," *Sociological Quarterly* 22, no. 2 (1981/1913): 151-180, quotation is on p. 155.

Putting these judgments of probability within a particular range has the effect of making them general and "Non-Ego" in Peirce's sense. All that this describes is the *Chance* that certain meaningfully oriented kinds of social action will occur continuously. We are led to infer a *generalizing tendency* that we, ourselves, are a part of in the very maintenance of its repetitions against the intrusion of disruptive error and chance. This gets around the presumption of capitalism as a container that is uniformly present, but rather as a loop that is continually present. The orientation can be a conception of order, as we might find, say, in the dictates of the Mont Pelerin Society, as a "thought collective."[817] But this is exceptional; far more typical is both the "dull" and violent compulsion evidenced by probabilistic judgments that keep subjective expectation looped into objective conditions by what appear to be the starkly evident consequences of *not* engaging in "steady, predictable reproduction."[818]

We would need a null case to really see how much this looping effect matters. For his part, Marx found one in the settler colonies of the 19th century (particularly Australia), which seemed to show what would happen should at least certain people find themselves outside the spatial range of capitalism's distinct pressures and simply not orient themselves to its same objective chances.

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[816] Stuart Hall, "The Problem of Ideology—Marxism without Guarantees," *Journal of Communication Inquiry* 10, no. 2 (1986): 28-44; Cedric Robinson, "Racial Capitalism: The Nonobjective Character of Capitalist Development," in *Black Marxism: The Making of the Black Radical Tradition* (Chapel Hill, NC: North Carolina Press, 1983), 9-29. See also, Michael Ralph and Maya Singhal, "Racial Capitalism," *Theory and Society* 48 (2019): 851-881.

[817] Phillip Mirowski and Dieter Plehwe (eds), *The Road from Mont Pèlerin: The Making of Neoliberal Thought Collective* (Cambridge: Harvard University press, 2015). Importantly, such conceptions of order were highly exportable, and in the form of explicit rules, would be imposed in post-socialist situations like Chile, Eastern Europe, and, most famously, "shock therapy" in the former Soviet Union.

[818] Vivek Chibber, *The Class Matrix: Social Theory After the Cultural Turn* (Cambridge: Harvard University Press, 2022), 123.

> [T]he expropriation of the mass of the people from the soil forms the basis of the capitalist mode of production. The essence of a free colony, on the contrary, consists in this, that the bulk of the soil is public property, and every settler on it can therefore turn part of it into his private property and his individual means of production, without preventing later settlers from performing the same operation. This is the secret both of the prosperity of the colonies and of their cancerous affliction—their resistance to the establishment of capital.[819]

In the settler colony, "the beautiful illusion is torn aside." The social dependence of the worker on the capitalist is recast with "smug deceitfulness by the political economist [who turns] this relation of absolute dependence into a free contract between buyer and seller." In the settler colony, by contrast, the worker "vanishes from the labor market—but not into the workhouse." Rather, what Marx observes is the "fragmentation of the means of production among innumerable owners, working on their own account, annihilates, along with the centralization of capital, all the foundations of combined labor."[820]

These are among the strangest passages in *Capital*, as they appear to suggest a hole in its firmament. Fredric Jameson interprets Marx as proposing two climaxes to capitalism.[821] One features heroic struggle: "the negation of the negation," "the expropriators are expropriated." The other is far more prosaic: would-be workers simply walk away and reorient themselves, engaging in social action incompatible with the maintenance of capitalism.[822] In this reading, Marx's claims feature a certain kind of probabilism. For the settler colony, the objective possibility of escape, of flight and exodus, in short, of *not looping in*, becomes apparent as the probabilities of capitalism found in the metropole diminish. The realistic judgment of dropping out of the labor market, only to be fated to poverty or a punishing workhouse, for example, carries *less* realism here. The "self-perpetuating dynamic" dissolves in this scenario—until it can be restored by extra-economic means. What must be restored is a typical judgment of objective probability. Hence, land expropriated from the (small proprietor) expropriators is made the property of imperial dominion, forcing the same *illusio* and risks that arise as a compulsion to correct errors that match capital's generative model, as opposed to those more "nomadic" by comparison, that appear to loop into nothing. This restores an orientation in settler laborers to probabilistically judge the compulsion.[823]

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[819] Karl Marx, *Capital* (New York: Penguin, 1976/1867), 934. Some settler colonists in the American colonies, arguably, exuded a similar non-capitalist orientation, particularly in the northern colonies on isolated family farms, where a non-commercial "proprietary" orientation took hold, uneven by comparison to merchant capitalists in northern cities and the slave plantations of the south; see Charles Post, "Agrarian Class Structure and Economic Development in Colonial British North America: The Place of the American Revolution in the Origins of US Capitalism," *Journal of Agrarian Change* 9, no. 4 (2009): 453-483. Ho-Fung Hung also describes a case, focused on Qing-era China, in which the appearance of capitalism is not maintained multi-generationally, because a distinguishably capitalist test (the stock accumulation of capital) does not take hold for the reproduction of elite status: "Successful entrepreneurial families' high propensity to transform themselves into gentry and state elite, together with gentry and state elite's relatively low propensity to transform themselves into entrepreneurs, limited the growth of the entrepreneurial elite's size and power." Ho-Fung Hung, "Agricultural Revolution and Elite Reproduction in Qing China: The Transition to Capitalism Debate Revisited," *American Sociological Review* 73, no. 4 (2008): 569-588, quotation is on p. 578.

[820] Marx, *Capital*, 937.

[821] Fredric Jameson, *Representing Capital: A Reading of Volume One* (London: Verso, 2011), 88-91. A similar argument for a waning orientation to capitalism in geographical fringes, borderlands and "exilic spaces" is documented by Andrej Gubacic and Denis O'Hearn, *Living at the Edges of Capitalism: Adventures in Exile and Mutual Aid* (Berkeley: University of California Press, 2016).

[822] Marx, *Capital*, chap. 32.

Yet *this* dispossession, contingent upon settler-colonial dispossession of indigenous land, only serves to highlight that it is an *orientation* at stake. What this general argument describes is something akin to finding the objective conditions in which what Weber calls associational action becomes vertically trapped within a probabilistic order and its distinct range of possibility. What we read in this historical account is a "genetic" or formation story.[824] Capitalism emerges as a set of typical probabilistic judgments, of objective probabilities that find certain subjective orientations. A probabilistic approach to historical change and formation favors more punctuated instances of order in its concentration on the appearances of loops and repetition. Probabilism, more generally, appreciates the eruption of chance-like dissolutions and distractions, but also draws our attention to duration as a puzzle: how probabilistic orientations that would, counterfactually, drift away instead become trapped in repetition.

Du Bois, Probabilism and Social Change

The origins of capitalism are documented, then, as the appearance of objective possibility as it finds subjective orientation. Actions that were once mostly horizontal (buying and selling via markets) become vertically arranged, and instead of merely instrumental, become objectively correct. The result is a distinct distribution of chances within a probabilistic order, of new tests and new capital, and therefore of a different future that now obtains repetition. Since we can measure its frequencies, we can see capitalism as such, but it is not merely numbers. Its remarkable availability to datafication and mathematization reveals the strong objective possibility of repeating frequencies extrapolated in the long run, with vertical capture, in this case, ensuring orientations remarkably without waver or with minimal distraction despite other differences. But what happens when the social change in question is not a surprise to its protagonists, yet remains completely unexpected to everyone else?

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[823] Ibid, 935.

[824] Pierre Bourdieu, *On the State: Lectures at the College de France, 1989-1992*, edited by Patrick Champagne, Remi Lenoir, Franck Poupeau and Marie-Christine Riviere, translated by David Fernbach (London: Polity, 2014/1989-92), 80.

For Du Bois, "Chance"—noticeably capitalized in both the published and archival version of his key essay "Sociology Hesitant"—finds its presence in action simply as "actions undetermined by and independent of actions gone before."[825] Chance did not convey randomness, then, something entirely outside of a range, but more like untapped openings in a present range of possibility: these actions could, in other words, be expected for those oriented even if they are surprising (at least to some). Sociology should take the form of a probabilistic science, with its goal distinctly "to measure the limits of Chance in human action.[826] Du Bois recommends adopting such a focus "hesitantly," however, which appears to mean devoting the lion's share of analytic attention to emergent patterns, particularly those of such persistent realization that, in Du Bois' view, they can faithfully be categorized as "laws." Such an endeavor should not come at the expense of eliminating what remains intrinsic "Chance," as untapped objective possibilities from out of the firmament of a presently engaged range.[827]

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[825] W.E.B. Du Bois, "Sociology Hesitant," *boundary 2* 27, no. 3 (2000/1905); 37-44, quotation is on p. 44. The origins of Du Bois probabilism are not clear. He knew Weber and his time in Germany could have exposed him to Kries. For William James ("The Dilemma of Determinism" in *The Will to Believe*, 155-56), an undoubted influence on Du Bois' probabilism, the presence of choice is made possible by alternate possibilities: "What is meant by saying that my choice of which way to walk home after the lecture is ambiguous and a matter of chance?...It means that both Divinity Avenue and Oxford Street are called but only one, and that one either one, shall be chosen." Because these possibilities were undetermined until we made them actual, this defined, very simply, the idea of chance. It remains an open question whether Du Bois' "Chance" shares the principle of undetermined alternative possibilities or whether possibilities fall within initial conditions (or "range"). The latter is closer to Kries and Weber than James. See Karida Brown and Luna Vincent, "American Pragmatism and the Dilemma of the Negro," pp. 364-377 in *The New Pragmatist Sociology : Inquiry, Agency, and Democracy,* edited by Neil Gross, Isaac Arial Reed, and Christopher Winship (New York: Columbia University Press, 2022) for more on the connection between James and Du Bois' probabilism. John Levi Martin ("What Sociologists Should Get Out of Pragmatism," *ibid*) finds Du Bois more of a probabilistic cartographer, who found general patterns and actions not mutually inconsistent but mutual indicators (51).

[826] See Du Bois, "Sociology Hesitant"; "The Atlanta Conferences" in *W.E.B. Du Bois on Sociology and the Black Community,* edited by Dan Green and Edwin Driver (Chicago: University of Chicago Press, 1978/1904), 53-61; "My Evolving Program for Negro Freedom," in *What the Negro Wants,* edited by Rayford Logan (Chapel Hill: University of North Carolina Press, 1944), 31-70, see especially p. 58.

[827] Du Bois, "Sociology Hesitant," 38; Jose Itzigsohn and Karida Brown, *The Sociology of W. E. B. Du Bois Racialized*

Du Bois thus makes clear his commitment to indeterminism, in which probability appears both objective and non-epistemic. On these grounds, he makes a substantive claim about the topic of "free will" and its non-priority in a world of Chance:

> Protagonists of "free" will are found to be horrified deniers of "Chance." And strenuous defenders of orthodox Science are found talking as though the destinies of this universe lie largely in undetermined human action—indeed, they could not avoid such talk and continue talking.
>
> Why not then flatly face the Paradox? [Why not] [sic] frankly state the Hypothesis of Law and the Assumption of Chance, and seek to determine by study and measurement the limits of each?[828]

Like Kries and Weber, Du Bois does not posit Law (necessity) and Chance (contingency) as opposites. What Du Bois asks sociologists to grapple with, instead, is what seems like a paradoxical relation when we keep the two separate, in a relation not dissimilar from probability over here and interpretation over there: "1. The evident rhythm of human action. 2. The evident incalculability of human action."[829] Du Bois also appreciates, with Weber, that making an "Assumption of Chance" puts sociologists in "fear of criticism" because such an assumption would forbid the complete quantification (datafication) of human action, not to mention disqualifying any association between causality and determinism. The only way to resolve this paradox is to think probabilistically as a logical and conceptual task, using the vehicle of words. Such a task which has been marginalized, Du Bois claims, ever since Comte proposed sociology as the premier science of Law.

As Du Bois tells his famous story of "the General Strike" by enslaved Black people in the south, which propelled the American Civil War toward its abolitionist outcome, it becomes evident that hanging over the events in question was the grand specter of surprise. We can read Du Bois' probabilism in this chapter and the novel structure of the argument. In Du Bois' narrative, the enslaved people were expected by no one to play a significant role in the trajectory of the war, not by Abraham Lincoln as he signed the Emancipation Proclamation, not by General William Tecumseh Sherman during his famous march through the south, and certainly not by the Union troops themselves, the vast

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Modernity and the Global Color Line (New York: NYU Press, 2020), 53.

[828] Du Bois, "Sociology Hesitant," 42.

[829] Ibid, 41.

majority of whom did not associate the war with Black emancipation.

At the point in Du Bois' book, *Black Reconstruction*, when he relays the events of the General Strike, he has already drawn out the "world of law" that made up the plantation system of the antebellum American south, with its delicate balance of three main classes: Black workers, white workers, and the planters. It was a world not of chance but of *different* Chances, though still a world that was constructed, in measurable part, through a manner of chance causation. Cotton, "a fiber that clothed the masses of a ragged world," grew exponentially in demand among cotton spinners and clothing manufacturers over the early 19th century, once its processing was made more efficient by the invention of the Cotton Gin in 1794. "Such facts and others, coupled with the increase of the slaves which they were related as both cause and effect, meant a new world; and all the more so because with increase in American cotton and Negro slaves, came both by chance and ingenuity new miracles for manufacturing, and particularly for the spinning and weaving of cloth."[830] This marked the birth of a "new economic organization," and "Black labor became the foundation stone not only of the Southern social structure, but of Northern manufacture and commerce, of the English factory system, of European commerce, of buying and selling on a world-wide scale."[831]

The objective probability for white labor in this arrangement was distinctive.

> [The] natural leaders of the poor whites, the small farmer, the merchant, the professional man, the white mechanic and slave overseer, were bound to the planters and repelled from the slaves and even from the mass of the white laborers in two ways: first, they constituted the police patrol who could ride with planters and now and then exercise unlimited force upon recalcitrant or runaway slaves; and then, too, there was always a chance that they themselves might also become planters by saving money, by investment, by the power of good luck; and the only heaven that attracted them was the life of the great Southern planter.[832]

The "chance" to become a planter was unique to the poor white, either in the role of artisans, professionals or directly tied to the plantation system in the form of police. Even if, statistically, the odds were against them, as a probabilistic order, the plantation system could maintain this orientation, and with it an *illusio* contingent on this (objective) opportunity, unavailable anywhere else.

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[830] W.E.B. Du Bois, *Black Reconstruction in America: An Essay Toward a History of the Part Which Black Folk Played in the Attempt to Reconstruct Democracy in America, 1860–1880* (New York: Harcourt, Brace & Co, 1935), 4-5.

[831] Ibid, 5.

[832] Ibid, 27.

The planters had the chance to become the vanguard of an American imperialism after the Mexican-American war in the late 1840s: "the South had conquered Mexico without help and beyond lay the rest of Mexico, the West Indies and South America, open to Southern imperialistic enterprise." Yet, to establish an "economic dictatorship," the only chance the planters had "was through a national economy, in a large nation where a home market would absorb a large proportion of the pro-duction, and where agriculture, led by men of vision, could demand a fair share of profit from industry." But the planters "surrendered this chance and went to war with the machine to establish agricultural independence."[833]

The distribution of chances to enslaved Black workers would become increasingly pronounced over the course of the war. Du Bois describes the chances of the Black worker, that plays into the entirety of the plantation system and makes "the General Strike" not surprising but objectively possible from the very beginning:

> as the war went on and the invading armies came on, the way suddenly cleared for the onlooking Negro, for his spokesmen in the North, and for his silent listeners in the South. Each step, thereafter, came with curious, logical and inevitable fate. First there were the fugitive slaves. Slaves had always been running away to the North, and when the North grew hostile, on to Canada. It was the safety valve that kept down·the chance of insurrection in the South to the lowest point. Suddenly, now, the chance to run away not only in-creased, but after preliminary repulse and hesitation, there was actual encouragement.[834]

The Union government did not plan or foresee "this eventuality," as Du Bois makes clear: "on the contrary, having repeatedly declared the object of the war was the preservation of the Union and that it did not propose to fight for slaves or touch slavery." Now it faced a "stampede of fugitive slaves."[835]

The general strike consisted of enslaved Black labor leaving plantations as the Union army marched through the Confederacy in late 1864. As this happened, it became clear that in the probabilistic order of the plantation system, and in spite of all appearances to the contrary, "the

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[833] Ibid, 47.

[834] Ibid, 62.

[835] Ibid, 62.

Southern worker, black and white, held the key to the war; and of the two groups, the black worker raising food and raw materials held an even more strategic place than the white."[836] Du Bois' point here is an important one: within this distribution of chances, *only* the enslaved Black laborer could make Civil War about the end of enslavement. Only in *their* orientation did the chance for that exist. The rest of those tied to the system had no such orientation, with the small exception of those who had managed to break from it with an orientation toward "other-worldly" chances, religious and moral.[837]

The implications of this are as follows: contrary to the now decades-long emphases on "contingency," "unsettled times," the "transformation of structures," and the "performative" break with the past, Du Bois remarks upon the treatments of the Civil War for which the "the General Strike" would come as a surprise in large part because these historians never discuss it and they, like nearly every white person at the time, did not expect it, even after the fact. Du Bois' analysis does not maintain that surprise, for the General Strike was not surprising, as a discontinuous, eruptive event, for the enslaved Black laborer.[838] This was not chance causation at work, which would defy all expectation because no one could loop into the possibilities; rather, adequate cause is found in the enslaved people's recognition of an opportunity as it objectively presented itself. As Du Bois describes the plantation system, the goal is to make the General Strike *expected* in the same way it was by those who did it.

This runs contrary, however, to the elective affinity between the non-probabilistic bases of most standard models of historical change and the tendency to fall back on *discontinuity,* as if there needed to be a sudden "break" in a horizontal sense, surprising to everyone involved, as the only way to account for how the social world changes. Discontinuity implies statistical independence of objective possibility across time, but this is only possible, in a probabilistic sense, when the probabilistic order is a game of chance that allows for the strict independence of one instant to another, so that what happens next need not have any link to what has happened before.[839] As we explain further below, probabilistic orders rarely assume a pure form of a game of chance, and so probabilistic sociology tends, instead, to "bring back" an emphasis on "ordinary" and "quotidian" temporal *continuity*, an immanent process of both stasis and change. It starts from the idea that to the extent the social world is orderly, this orderliness is distributed continuously in time "and it obeys immanent tendencies."[840]

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[836] Ibid, 63.

[837] The key figure here is the abolitionist John Brown who would be executed for his involvement in the raid on the federal arm's depot at Harper's Ferry (now in West Virginia) in late 1859. With an orientation toward an other-worldly space, a *field* of this kind, social action can break with typical expectation. Du Bois' earlier biography of Brown describes Brown as a combination of opposing tendencies and cleft dispositions, oriented by both the powerful other-worldly chances of eternal salvation and the more mundane tests typical of a white tanner of the period:

> All this is evidence of a striving soul, of a man to whom the world was a terribly earnest thing. Here was neither the smug content of the man beyond religious doubt, nor the carelessness of the unharassed conscience. To him the world was a mighty drama. God was an actor in the play and so was John Brown. But just what his part was to be his soul in the long agony of years tried to know, and ever and again the chilling doubt assailed him lest he be unworthy of his place or had missed the call … Sometimes this prosaic tinkering with things burdened, buried and submerged the spiritual life and striving. There was nothing left except the commonplace, unstable tanner, but ever as one is tempted thus to fix his place in the world, there wells up surging spiritual life out of great unfathomed depths—the intellectual longing to see, the moral wistfulness of the hesitating groping doer. This was the deeper, truer man, although it was not the whole man.

See, W.E.B. Du Bois, *John Brown* (Philadelphia: George Jacobs & Co, 1909), 46-47; Du Bois, *Black Reconstruction*, 48.

[838] See Du Bois, *Black Reconstruction*, chap. 27.

A general tenor of surprise at the war and surprise at its direction courses throughout Du Bois' *Black Reconstruction*.[841] But in Du Bois' persistent emphasis on surprise, we can identify his point of intervention as, in fact, revolving around a proposal for temporal continuity. In *Black Reconstruction*, the enslaved peoples of the south were the *only* adequate cause of abolition as an outcome of the American Civil War because they were the only participants who *expected* that it would be. Against the political left at the time of writing the book in the 1930s, during the Great Depression, Du Bois dispels the surprise (disbelief) that this group could be the orchestrating force of social change. He attempts to shift expectations of revolutionary action (and revolutionary actors) that otherwise remain keyed to the *Chance* of white male industrial labor.[842] In Du Bois' narrative, there was nothing surprising about the General Strike, even though those who withheld their labor so dramatically and with such consequence looked nothing like the orthodox image of a Marxist proletariat.

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[839] This implies a view of social action "rooted in the idea that the world could be a game of roulette, where with every turn of the wheel things would start from scratch." Pierre Bourdieu, *Forms of Capital: General Sociology, Volume Three (Lectures at the College de France, 1983-84)*, translated by Peter Collier (London: Polity, 2021/1983-84), 130.

[840] Ibid, 131.

[841] Du Bois, *Black Reconstruction*, see p. 55-57, 84-85, 131-32, 529, 716.

[842] "What is the object of writing the history of Reconstruction? ... It is simply to establish the Truth, on which Right in the future may be built. We shall never have a science of history until we have in our colleges men who regard the truth as more important than the defense of the white race, and who will not deliberately encourage students to gather thesis material in order to support a prejudice or buttress a lie." Ibid, 722, 725; see also Cedric Robinson, "A Critique of W.E.B. Du Bois' *Black Reconstruction*," *The Black Scholar* 8, no. 7 (1977): 44-50; Eric Foner, "*Black Reconstruction*: An Introduction," *South Atlantic Quarterly* 112, no. 3 (2013): 409-418.

Coda: The Mark of Probability

The focus on historical and social change makes it easy to speak of the differences between a probabilistic and a non-probabilistic method. Such a difference has nothing to do with qualitative versus quantitative, recording words, observing deeds versus tabulating frequencies. It is instead defined by the presence or absence of probabilistic reasoning. Primarily, whether a method accounts for probability in action or restricts probability to a measurement device (and perhaps disregards it entirely) will dictate its degree of nominalism, with nominalism being a measure of how distant the analysis of a definite arrangement is from consideration of its continuum or range of possibility (its *Spielraum* of initial conditions). The easiest way to avoid nominalism, which among other things fixes outcomes arbitrarily and results in blindness toward objective possibility, is to identify probability in action, in the form of expectations, as probabilistic judgments loop into some arrangement of objective probability. From an analytic point of view, this also includes the element of surprise. A probabilistic approach to sociological method has as its general task to transform surprise into expectation. On this note, consider a last example which, in its deservedly praised reception, demonstrates the fundamental and instrumental role of probabilistic judgments when endowed with a force, not that causes an outcome alone, but which, in their selective test, results in a distinct distribution of chances as an unmerited fate.

In Devah Pager's groundbreaking research, the "mark" of a criminal record and race itself—being Black, more precisely—operates as a kind of negative credential on the labor market.[843] Pager begins her argument by pointing to a set of objective probabilities that sociologists now know well: "Using longitudinal survey data, researchers have studied the employment probabilities and income of individuals after release from prison and have found a strong and consistent negative effect of incarceration."[844] But why is this? Pager's original piece focused on the limitations of purely observational survey data to establish this as an objective probability. After all, incarcerated individuals could be different from non-incarcerated ones on an infinity of other (unmeasured, unmeasurable) characteristics. In addition, even if we were to believe a given observational correlation, survey research is unable to "formally identify mechanisms," or the intervening process connecting antecedent conditions (incarceration status) to outcomes (decreased labor market opportunity).[845]

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[843] Devah Pager, "The Mark of a Criminal Record," *American Journal of Sociology* 108, no. 5 (2003): 937-975.

[844] Ibid, 939.

The results have since passed into sociological lore as prime evidence for the existence and consequences of structural racism. While the mark of criminal record depressed the chances of being called back for an interview for whites, the surprise comes as the effects of race outweighed those of a criminal record: specifically, Black testers *without* a criminal record were *less* likely to be called back than white testers *with* a criminal record, and with Black testers with a criminal record being doubly discriminated against, having a minuscule probability (5%) of receiving a callback. Should action be taken into account to explain this effect further, we might find an account like the following: employers *need* to meet staffing needs with workers, and they *apply* certain habits to so, having *first perceived* the situation through a racial placement that accords with the structure. Potential employees (Black, male, criminal record) are *believed* to be not trustworthy, meaning that the hiring *decision*, on this basis, systematically generates "discriminatory allocation outcomes."

This account makes an observed correlation into an explanation of action, but there are two self-imposed limitations: first, prediction remains at the level of the variable and plays no role in the action sequence; second, the italicized terms are tokens of personal explanation, but of exactly the sort derogated by data science as justification for the dismissal of action. They are intuitively salient but remain at a purely horizontal level and feature no connection to the kinds of objective probabilities that Pager's analysis describes quantitatively. These tokens share the presumption of transparency and unproblematic operation, particularly about perception, which means that they presuppose a lot of what we have called subpersonal explanations.

To suggest a probabilistic alternative in the above case, then, would consist of asking how racialized generative models predict discriminatory allocation decisions through the mediation of a criminal record. Calling back Black men without a criminal record would potentially challenge internalized racist generative models predicting their criminalized status without having to see direct evidence of potential threat; for instance, potential employers receive high-precision evidence that

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[845] Ibid, 939. Pager addresses these challenges using a now-classic experimental audit study. Four men auditors (23-year-old college students from Milwaukee), two white and two Black, were sent out to apply for job openings to entry-level positions. Working in (same race) teams of two, testers applied for the same jobs and were matched on all "objective" characteristics listed on their applications (e.g., education, job experience, etc.) except for criminal record status, which shifted between applicants within the team every week of the study.

Black men are neither preemptively criminal nor bad employees. So, *not making the call* is a consequential action, and it is, in fact, a form of active inference that perpetuates and self-fulfills a racist generative model.

For probabilistic generative models to be *racialized* means to reinforce or allow for only *certain* active inferences, which means that the source of discriminatory allocation decisions is, more strictly speaking, in practice rather than in meaning. While the criminal record functions as a "negative credential" in Pager's case, whiteness serves as a positive credential, rendering criminalized white people more employable than (officially) non-criminalized Black people. Whiteness cancels any "error" produced by the perception of official criminalization, while Blackness does the same in the other direction, producing self-fulfilling evidence that in the labor market to be Black is to be *de facto* criminalized.

Thus, when faced with discrepant combinations violating expectations (white/criminal, Black/non-criminal), what we observe here is *not* a "perceptual inference" that simply updates a top-down prediction by bringing sensory input into alignment with a preexisting interpretive structure. Racialized "discrimination" in the labor market is instead active and rooted in action even if not always "willful" in the naive personal sense. The only necessary condition is a generative model for which action (e.g., decision to hire) generates the sensory inputs that it expects (e.g., active inference). The "mark of a criminal record" is comparatively negated for whites in the very same way that it is implicitly assumed (e.g., generated as an expectation) for Black applicants, whether "marked" on paper or not. Thus, the minimization of error becomes conditional on maintaining a racist labor market, extending all the way down to the action generating sensory input, which in this case means that "discriminatory allocation decisions" are really a systematic (e.g., chance-expectation loop) reinforcement of *racialized* objective probability. Racialized decision-making remains hidden in a veil of ignorance. The decision-maker predicts so as *not* to perceive, canceling the discrepancies as they go along.[846]

The acquisition of generative models that can have this reinforcing effect through expectations does not commit a probabilist to also claim that these generative models have an objective "accuracy." Such an implication is often what leads sociologists to focus on the contingency of "interpretations" or variably internalized "beliefs" to account for results that they otherwise explain as the *predictable* outcome of a structure This introduces a discontinuity: structures are the grounds for prediction, but prediction plays no role in action; other factors are enlisted instead, which either appear contingent or necessary. This retelling of Pager's analysis seeks to avoid such a discontinuity. Such an account is also different from so-called "statistical discrimination" that makes the hiring decision "rational" under conditions of imperfect information. Rather, the objective probabilities that are the source of these generative models draw our attention instead, such that action cannot reduce prediction error of various and seemingly unrelated sorts without also reinforcing racist classifications.[847]

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[846] Mueller, "Racial Ideology or Racial Ignorance?"

At the heart of a racialized social system, consisting of infinite numbers of perceptions, decisions, and actions is an expectations-chances loop that manifests in single-case probabilities that demonstrate these frequencies when counted and classified. But the frequencies are not the source of the probabilities; neither are they determinative. We have attempted to conceptualize probability at its source at it emerges from a looping connection, rooted in what we have called expectations, but which assume the form of a generative model featuring tendencies in basic cognitive engagement with the world (predicting sensory inputs) that, as we extrapolate, appear as historically formed, socially rooted, emotionally entangled (a "social practice" in Clark's words) and with the clearly patterned result ("in the long run") of a distinct frequencies, which to be measurable like this, must be repetitions, broadly shared and self-sustaining. This, we will now claim, is the key to a reconfigured, probabilistic grasp of the social world.

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[847] See also Eduardo Bonilla-Silva, "Rethinking Racism: Toward a Structural Interpretation," *American Sociological Review* 62, no. 3 (1997): 465-480, see p. 471-72.

Chapter 11 - Reconfiguring Our Grasp on the Social World

> *In the social world, you don't convince anyone by quoting statistics. A scholar can never have the last word if at a given moment the social truth is stronger than the scientific truth. I think that this is also extremely important for understanding the peculiar status of the social sciences.*
>
> ~ Pierre Bourdieu, *Principles of Vision*

We can boil the preceding discussion down to two fundamental points. First, if we focus relentlessly on action, probabilities will always be more real than "reality." Second, if we focus on basic questions rather than central problems, social constructions emerge as probabilistic orders, with their manifest form tying into something latent, namely the mechanisms keeping the chance world at bay through repetitions, rhythms, sequences, and durations. Among those mechanisms, indeed foremost among them, is the requirement that actors loop *into* chances and acquire expectations. We have called this *vertical capture*. Only in this way can error minimization unfold horizontally, moving forward in time, motivated by desire and guided by belief; as a result, sustaining collective orders.[848] But far from this loop being the work of the head alone, it is the work of the body. We cannot tell in advance which parts of us will be vertically captured.

Take the example of language, which in its close consideration over the last hundred-plus years has conceptually shaped much of human science. To finally reframe the linguistic foundation of concepts like structure and meaning would, it seems, make a big difference. When the analysis of language uses probabilistic reasoning, a different set of linguistic keywords appears: learning, probability and chance. From this perspective, the acquired ability to use and understand language does not depend upon innate, "biologistic" traits akin to what the linguist Noam Chomsky famously called "universal grammar."[849] Neither is language an entirely objective formation, "like a structure" of binary opposition in the sense credited to Ferdinand Saussure. Rather, language is essentially *learning* and is indefinable apart from it. When we learn language we learn frequencies and probabilities as guided and reinforced by the expectations of others. This can include "hyperpriors" of grammar (like Chomsky's), in addition to the binary oppositions that the classical structural linguistics rests *its* case on.

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[848] See Andy Clark, "Beyond Desire? Agency, Choice, and the Predictive Mind." *Australasian Journal of Philosophy* 98, no. 1 (2020): 1-15.

[849] Noam Chomsky, *Syntactic Structures* (The Hague: Mouton, 1957). "When knowledge of language is reduced largely to knowledge of form-meaning mappings, and most of those mappings are specific to particular languages, little is

Simply put, then, *learning language means learning probabilities*, and language in turn means an order of objective probability and, we might say, the guessed perception of *Chance*. This means learning the place and context of word use, acquiring habits that allow for fluency as a cognitive and perceptual trait, through attempts to communicate in ways that interlocutors will expect. It also means learning "an intricate sequence of muscle movements" looping in by way of expectation and chance.

Each of these is a bearer of linguistic meaning (context, habit, muscle movement), and the easiest route to learn to *make* meaning is through a kind of adaptive *loop* that enhances the likelihood of matching expectations: "if one wants to *maximize* one's probability of choosing the right form on a particular test, one should always choose the most likely form given the current cues … Unless there are some occasions on which the more frequent form *will not do*, we should all *maximize,* choosing the more frequent form every time."[850] We can know the frequency with which a given word is used in a particular context. We can also take a different tact; we can say "utilize" instead of "use," "fastidious" instead of "detail-oriented." The words are not mere synonyms because they have different probabilities and contexts of use. Purely as a question of frequency, to use one rather than the other can provoke a response from those who notice the change because they hold the same expectations. We can also say "rat" instead of "cat" in a situation where something that looks like a cat is on a mat. This will be meaningful firstly because it defies expectations and does not "probability match" in its formal link of sign to referent, and secondly because of what such unexpected defiance might signify.[851] Did we use the wrong word on purpose? Are we joking? Do we need our vision checked?

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to be gained by positing that a few of these mappings are innately known to exist. To the extent that synchronic universals are found, they are rather straightforwardly explained by the uses to which every language is put, the universal dynamics of language learning and processing, and the fact that any production involves planning and executing an intricate sequence of muscle movements." See Vsevolod Kapatsinski, *Changing Minds, Changing Tools: From Learning Theory to Language Acquisition to Language Change*, (Cambridge: MIT Press, 2018), quotation is on p. 302.

[850] Ibid, 42.

[851] Serban Musca and Anthony Chemero, "Word Frequency Effects Found in Free Recall are Rather Due to Bayesian

Linguistic meaning may still feature something like binary oppositions, yet the structure is far more fluid than typically understood. It consists, as all probabilistic orders do, of a *distribution of chances*.[852] To use a word on a given occasion involves the probability of using it, which corresponds to an expectation. The capacity to use language refers to the capacity to form expectations and to associate meaning with this objective probability, as language serves as arguably the principal example in the human sciences of duration in action (e.g. something which *could* change in every instant, and is fundamentally arbitrary, though it does not change and even appears as necessary, with no *other* possibility). Every linguistic "trial," every instant marked by the chances of language use, finds the possibility of something different, for the simple reason that language is not deterministic, but operates, rather, on the basis of cues and guesses. When we learn its probabilities, we orient toward a presumed world of arbitrariness (e.g., like the arbitrary referent of a word) made to appear necessary, in its perceived *Chance*, by becoming objectively probable. Regardless of the presumed world in question, we embody a predictive environment. With language, probability is encoded into a musculature (facial muscles, vocal cords, tongue) as our bodies persistently loop into what we have learned.[853] We notice deviations, by ourselves and others, and engage in corrective action. The same relationship between an arbitrary (art, science, morality) and a probabilistic order, specifically the recognition of this probabilistic *layer* of ordering and its direct relationship to social action, is (as we argue below) at the heart of a probabilistic turn in the human sciences.

The principles at play here are all probabilistic. Should we try to find statistical evidence for them or claim that their probability amounts to statistical facts, we will find ourselves confronting an uncomfortable silence, futilely trying to summarize a social truth with a statistical description. Sociologists know that something is lost in translation here. Still, as we have stressed, a social truth must be no less probabilistic than a statistical measurement to be convincing, which, *eo ipso*, means it

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Surprise," *Frontiers in Psychology* 13 (2022): 940950.

[852] Alina Arseniev-Koehler, "Theoretical foundations and limits of word embeddings: what types of meaning can they capture?" *arXiv preprint arXiv*:2107.10413 (2021).

[853] From this perspective, ableism implies a normative way of learning, looping into and embodying objective probability, when embodiment remains essentially non-determinate outside of the factors (like the design of objects and architecture) that render a certain mode of embodiment *as* normative. Other organic parts, for example, like hands, fingers and arms, can *be* embodied via the same objective probabilities of language. See Athena Engman and Cynthia Cranford, "Habit and the Body: Lessons for Social Theories of Habit from the Experiences of People with Physical Disabilities," *Sociological Theory* 34, no. 1 (2016): 27-44; Alphonso Lingis, "The Society of Dismembered Body Parts," in *Deleuze and the Theater of Philosophy*, edited by Constantin Boundas and Dorothea Olkowksi (London: Routledge, 1994), 289-303.

must be presented as an account of action. It is true that, from the beginning, action has generally found consideration not as a data point but as a "frame of reference."[854] We propose something different: action is a site of probabilistic realization, as it is only *in action* that the distinction between "definite arrangements" and ranges of possibility are reconciled, navigating the space between the *should,* the *could*, and what *actually* does happen. This unfolds against a background of what we may identify as "reality" but can only consist of limiting or holding concepts for what will always elude an exhaustive conceptualization.

These are paradoxical and complementary requirements, as they take repetition as their basic principle. There are always some chances available, and their practical significance tends to be the same—until it is not. For Weber, this could be a formally true statement but also refer to a historical variation: bureaucracy has made the *fortuna* that an early modern figure like Machiavelli so desperately feared more or less disappear as bureaucratic tools specify the range of possibilities that we do confront, loop into, and expect as a horizon of chances.[855] It is only at the end, *in action*, that the probabilities can confirm the very dynamic in charge of constructing them. In this case, the possibility of a cause has less symmetry than the effect, objective possibility does not approach 1, a *Spierlarum* is never fully exhausted in outcomes that derive from its initial conditions: this implies that if possibility were not effectively fulfilled in action, causality would remain a strictly logical category.

To summarize, we now specify and consider the toolkit of concepts informing the probabilistic approach. As we have suggested, probabilism is consistent with many core tenets of the pragmatist program; here, we will stress a crucial conceptual difference between the two. Pragmatism's focus on action *qua* problem-solving gestures, in many ways, toward a form of repetition (*continua repetitio*) and therefore a kind of continuity frame, though it is largely unspecified. Meanwhile, the internal genesis of probabilities conveys a larger architecture that, like all architectures, can be modeled. We propose that modeling probabilistic orders is possible by attending to extrinsic differences in how they both tame chance and invite it in.

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[854] Talcott Parsons, *The Structure of Social Action* (New York: McGraw-Hill, 1937), 731.

[855] The political historian and theorist J.G.A. Pocock puts the early modern European appraisal of *fortuna* this way, emphasizing its unknowability, and also its gender, as a direct extension of late-Roman and early medieval conception clearly adapted to a chaotic environment: "Fortune is, first of all, the circumstantial insecurity of political life. Her symbol is the wheel, by which men are raised to power and fame and then suddenly cast down by changes they cannot predict or control. It is engagement in the affairs of the *civitas terrena* which commits us to the pursuit of power and so to the insecurities of fortuna; but if happenings in the world of power-centered human relationships are of all things the least predictable and those we most desire to predict, the political symbol of fortuna is thus able to stand for Plato's phenomenal world, the image created by our senses and appetites, in which we see only particular things succeeding one another and are ignorant of the timeless principles which give them reality." See J.G.A. Pocock, *The Machiavellian Moment: Florentine Political Thought and the Atlantic Republican Tradition* (Princeton: Princeton University Press, 1975), quotation is on p. 38. The unknowable sources of *fortuna* stand in contrast to the real but (ultimately) unknowable sources of *Chance*, as chance can still be (partially) tamed by statistics and expectation. The relative displacement of *fortuna* by *Chance* as an outcome of bureaucratization goes hand in hand with rationalization via scientific knowledge, as Weber famously articulates in "Science as a Vocation." In the Epilogue, we emphasize parallels between the revamping of probabilistic orders as machines via the data influx and a condition not dissimilar from the one given voice by Boethius, the late-Roman source of the concept of *fortuna*. See also Kari Palonen, "Max Weber's Reconceptualization of Freedom," *Political Theory* 27, no. 4 (1999): 523-544.

Three Kinds of Looping Effect

For probabilistic sociology, the key empirical frame is that of *the loop,* or repeating connections between two nodes with an aggregate effect of building integrity and coherence vertically and maintaining regularity and predictability horizontally. By contrast, non-probabilistic sociology remains empirically "hesitant" as Du Bois suggests: by not adopting a radical continuity and allowing probability to loop back into itself, it remains trapped between unpalatable binaries.[856] For instance, social groups are *either* mere nominalist categories that exist only on paper *or* "underlying" self-acting, substantive classes only to be asymptotically approached but never fully captured. For probabilistic sociology, social groups are instead "funded" in and through action because action is prediction. By engaging in error minimization according to expectations established by a generative model, and adapting in anticipation to the very classifications aimed at describing them—which can apply to any social differentiation—"groups" can appear in more than name only and as more than *mere* statistical traces. Such a perspective indicates the relative autonomy and heterogeneity of probabilistic structures with enough internal consistency to be the source of contiguous and shared first-person generative models that can align, in their predictions, with our third-person predictive variables. This, as we will show, is a key variation and provides us with an empirical portrait of continuity, regularity, and predictability, but also of discontinuity, randomness, and unpredictability.

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[856] See W.E.B. Du Bois, "Sociology Hesitant," *boundary 2* 27, no. 3 (2000/1905): 37-44. In addition to groups, other binaries include structure as either a "methodological" reference to a continuous and distributional range of objective probabilities, or the foundation of all social reality that becomes only partially manifest in mechanisms and experiences; agency as either the autonomy of the mental and the intentional or the fulfillment of structurally derived prerogatives and the power-laden projects of "rectors." The latter arguably shows the futility of trying to resolve these binaries and their attendant problems non-probabilistically, as agency theory requires "settling the question of agency before the use of structural models," an antinomy (in the Kantian sense) that seems to have been proven impossible to solve. If we are not expected to force structure (awkwardly) into personal explanation, this makes it possible to find the relations through which generative models make groups and group differences real in their relation to objective probability. See Omar Lizardo, "Beyond the Antinomies of Structure: Levi-Strauss, Giddens, Sewell and Bourdieu," *Theory and Society* 39 (2010): 651-688, quotation is on p. 685.

Arguing for the existence of groups as a higher-level social formation fits with the prerogative for radical continuity in a vertical sense. Error minimization happening at lower levels of aggregation makes prediction at higher levels possible, including predictions on gathered data. But the probabilistic existence of groups also makes a horizontal continuity claim in a not altogether unfamiliar manner, particularly regarding social structure. Because of its emphasis on a loop, probabilism in such a form might remind one of the litanies of schemas (and structures) made famous by William Sewell's reworking of Anthony Giddens's structure/agency model.[857] But there is an essential difference between the structurationist appeal and the probabilistic appeal to looping. For the latter, generative models attempt to cope with objective probability by making available expected sensory inputs: there is a link between initial conditions and a distribution of probability.

On the grounds of initial conditions, we expect a distribution of outcomes, as actual or observable events, which can be single-case or statistically measured. This could be as simple as the initial conditions for taking a walk in the morning: our ability to walk, the ground beneath our feet, what kind of ground, the weather outside. And the outcomes of those initial conditions: the likelihood of walking in the morning, by whom, where, etc. We can measure a probability distribution over both the initial conditions, as propensities, as single-case chances (what conditions predict morning walks, inferring from this a judgment of probability), and over the distribution of outcome (who actually does take morning walks, under what conditions, etc). Fundamentally, the focus here is on temporal relations of anticipation, possibility, and succession (chance-expectation loops). We are interested in action as the link between initial conditions and outcome, which, though the distinction is ultimately an analytic construction, mirrors the same criteria for action: what creates the basis for making probabilistic judgments is the same source for what generates outcomes both statistically and *in action*. In certain cases, this can be based on schematic (interpretive) assimilation of a material situation (schema-resource loops) or on the naming of certain traits under a particular classifying label, putting action under a certain description.[858] But we cannot assume that these are always key aspects of the initial conditions that create a range of possibility, or that they are important for how probabilistic judgments are formed.

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[857] William Sewell, "A Theory of Structure: Duality, Agency and Transformation," *American Journal of Sociology* 98, no. 1 (1992): 1-29; Anthony Giddens, *The Constitution of Society* (Berkeley: University of California Press, 1984). For an application of Sewell's principles to group-formation, see Moon-Kie Jung, *Beneath the Surface of White Supremacy: Denaturalizing U.S. Racisms Past and Present* (Stanford: Stanford University Press, 2015), 21ff.

Structure and "enclosure" (as Ian Hacking puts it) tend instead to equate regularity, or predictability, with *generality,* when it should instead be rooted in *repetition*. This means they account for formations of scale (like structures) according to interchangeable characteristics, which can only appear in an accidental relationship, but instead ones that have an adequate, and this sense singular, connection to each other. This is the difference between, say, an echo of a song (repetition) versus an exchange of money for goods (generality). In the latter case, the connection of money to whatever it can buy is perfectly arbitrary: a gallon of milk and $3.50 are equivalent to each other; one can adequately cause the other to appear, but we know perfectly well they are capable of different things other than this. The echo retains the same characteristics as its original creation; it does not make more sounds (arbitrarily) equivalent to it. The echo remains itself until it goes silent.[859]

The only way to account for repetition in a probabilistic sense is to explain how an original is retained across its iterations; this requires, as we argue, that it be expected and that deviations from the original be noticeable, which in turn requires an account of the construction of the range of possibility in which connections between initial conditions and outcomes, events, actions, *can be* expected. The first of these looping effects we will call *interpretive*, the second *description*, and the third *probability*.

Interpretation Loops

The first is the interpretation loop. For Sewell, the concentration on "duality" features two ontologically different kinds of things (schemas and resources); but duality is difficult to sustain when put into action, essentially to explain how schemas can cause any change of resources or vice versa. The two seem to be in only an accidental relation. So here Sewell introduces a "mutually sustaining" loop between schemas and resources, as mentioned in the following, influential formula and applied (famously) to a theory of structure:

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[858] Ian Hacking, "Kinds of People: Moving Targets," *Proceedings of the British Academy* 151 (2007): 285-318.

[859] We draw this example from Gilles Deleuze, *Difference and Repetition* (New York: Columbia University Press, 1994/1968), 1-2.

> Structures … are constituted by mutually sustaining cultural schemas and sets of resources that empower and constrain social action and tend to be reproduced by that action. Agents are empowered by structures, both by the knowledge of cultural schemas that enables them to mobilize resources and by the access to resources that enables them to enact schemas.[860]

As Sewell implies, schemas and resources mutually sustain each other through their repeating connection. A schema remains an effect of resources, just resources are the effect of schemas.

> When the priest transforms the host and wine into the body and blood of Christ and administers the host to communicants, the communicants are suffused by a sense of spiritual well-being. Communion therefore demonstrates to the communicants the reality and power of the rule of apostolic succession that made the priest a priest. In short, if resources are instantiations or embodiments of schemas, they therefore inculcate and justify the schemas as well.[861]

Sewell's "mutually sustaining" loop does suggest a deeper effect, as the very constitution of a set of properties as "resources" are schema-dependent, just as the constitution of mental categories as "schemas" are resource-dependent. Sewell characterizes the mutually sustaining link, or the effect of resources as *caused* by schemas, as "reading" or we might say "interpreting."

But this is vague, outside of what we have described above as interpretation that stabilizes a chaotic situation in which initial conditions are highly sensitive to chance and correspond to chaotically shifting outcomes. In the case of a hierarchical scenario like the beginnings of the Catholic church, we can imagine such a stabilization is crucial, given the broad proliferation of religious practices; so it became essential to give an (authoritative) interpretation of liturgy. This, we would contend, is the only way that Sewell can make the implied mutually sustaining loop appear from a "duality" that otherwise treats schemas and resources as ontologically separate. So, to avoid the intractable horns of idealism versus materialism, Sewell must draw in a probabilistic dimension: the schemas that "interpret" resources are those that stabilize the links between initial conditions and outcomes. In this case, that means ensuring that the priestly transformation of the body and blood of Christ are all that can predict a "sense of spiritual well-being," as opposed, say, to a very different pathway to the same "sense," involving an unpredictable array of practices signaling the same potential, subject to constant change. As Sewell argues, we can observe the same recipe as power that stabilizes culture, gives it coherence, produces it; but to do that, the duality of structure must become probabilistic, which means creating circumstances in which predictions can be made and expectations formed.[862]

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[860] William Sewell, "A Theory of Structure: Duality, Agency and Transformation," *American Journal of Sociology* 98, no. 1 (1992): 1-29, quotation is on p. 27.

[861] Ibid, 13.

The thing about a loop is that it must *repeat* (again and again); each repetition (re)generates a *potential* for further iterations, fueling its own momentum. What does thinking probabilistically, with repetition as our key, get us? Structures refer to initial conditions with predictable outcomes, that are secured, in part, by an interpretation, which can "echo" cross-situationally as it tames an identical source of chaos, thus creating the possibility for predictable outcomes. Signs are always in formation, as opposed to "formed," as they habitually (repetitively) engage chaos with interpretation, which can be an enormous source of power. The interpretation secures a very basic stability in initial conditions, and as this happens, a probability distribution appears, of actions, events, changes to the physical environment. Their otherwise accidental, chance connections are replaced by relations of adequate causation. The result is a loop that propels itself forward.

But we should not assume that interpretation will *always* increase objective possibility in this regard. For instance, we can interpret a coin toss, but the invariance of outcomes despite changes of initial conditions (where the coin is tossed, what coin is used, why the coin is tossed) is exactly the appeal of a coin-toss. An interpretation won't matter for its objective possibility: whether we interpret heads as that God exists and tails that God does not, if heads I will live to 100 and tails that I will live to 50, whether heads will show who is divine and tails who is not—this will not change the possibility that the coin will either turn heads or tails. We might dispute the belief implicit to a fair coin-toss: that the coin is not biased toward either of its two results. This is not chaos, exactly; we can subject the coin to tests. We can simply replace it with another coin. The point is that the invariance of outcomes does not *depend* on our interpretations, even if we have them (as we surely do).

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[862] William Sewell, "The Concept[s] of Culture," in *Beyond the Cultural Turn*, edited by Victoria Bonnell and Lynn Hunt (Berkeley: University of California Press, 1999), 55. Recently, Matthew Norton has made a similar proposal in his examination of "interpretive institutional infrastructures." Using the example of piracy, Norton demonstrates how "institutional power, achieved through enchained, coordinated performances of meaning propagated and ratified through collective action both within and across situations, is always dependent on an institutionalized capacity for saying 'what is what.'" Thus, the contingency of interpretation comes in by way of the very need to define "what is piracy." In a looping rendering, this interpretation would resolve this bit of chaos into a kind of propensity in every subsequent situation, enabling a verdict, a denouncing speech, the construction of a physical environment, or a novel (a movie) to all be about the same thing, invoke the same thing, and signify, in Peirce's sense, by predicting. Incidentally, all of this (in Sewell's encompassing definition) could be "structure." Matthew Norton, *The Punishment of Pirates: Interpretation and Institutional Order in the Early Modern British Empire* (Chicago: University of Chicago Press, 2023), 23.

Description Loops

This link between repetition and loops has been neglected to date, and both are overshadowed by appeals to duality both in Sewell's sense and in institutional theory. Such neglect means that looping effects are discussed separately from the prevalence of scaled orders and formations, with the range typically associated with structures. As this would suggest, structures depend on a repeating interpretation that arbitrarily settles chaos through meaning; the effect, in probabilistic terms, is to prevent the small variations in initial conditions that can create big variations in outcomes. There is contingency in how this is done, as Sewell emphasizes alongside interpretivists. One schematic interpretation is interchangeable with another. In a probabilistic sense, this is how interpretation can be the "difference that makes the difference."[863] But there is another way of creating a loop, one that does not interpretively secure some initial conditions against chaos, but instead links descriptions and actions.

Suggestions in this direction are made by Hacking's famous analysis of "looping kinds." Loops come from the process of classification and categorization that feeds a "dynamic nominalism," and we emphasize the phrase *dynamic* here. Hacking's focus is clear: as opposed to "arid and scholastic forms of nominalism," his looping approach "contends that our spheres of possibility, and hence ourselves, are to some extent made up by our naming and what that entails."[864] Hacking's loop has become so popular it is often synonymous with "looping effects," not least because it makes arguments that align with both action theory and discursive construction.[865] Classifications are made by people (generally, authorities, experts, claiming some centrality or distance) *about* people as an index of traits and properties displayed by the latter. In this version of a Hacking loop, these traits are given a vertical source that they horizontally maintain. The classifiers "create certain kinds of people that in a certain sense did not exist before," which puts the onus on the "name" externally imposed on bundles of traits, collecting them together into an ad hoc category, creating a coherence this way.

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[863] Marshall Sahlins, *Culture and Practical Reason* (Chicago: University of Chicago Press, 1976), 63.

[864] Ian Hacking, *Historical Ontology* (Cambridge: Harvard University Press, 2002), 170.

[865] Jaakko Kuorikoski and Samuli Pöyhönen, "Looping Kinds and Social Mechanisms," *Sociological Theory* 30, no. 3 (2012): 187-205; Tuomas Vesterinen, "Identifying the Explanatory Domain of the Looping Effect: Congruent and Incongruent Feedback Mechanisms of Interactive Kinds," *Journal of Social Ontology* 6, no. 2 (2020): 159-85.

A nominal category is legitimized and managed by expertise, elaborated by institutions, and officialized by bureaucracy, all of which reinforces its external and public existence as legitimately recognizable. As Hacking puts it:

> In 1955 "multiple personalities" was not a way to be a person, people did not experience themselves in this way, they did not interact with their friends, their families, their employers, their counselors, in this way; but in 1985 this was a way to be a person, to experience oneself, to live in society.[866]

The intervention of 30 years meant the formulation of this name, the proliferation of knowledge about it, and the accumulation of references under its heading, to give it a distinguishable, stable external presence by indexing various evident things (e.g., "*this is that*"). While the traits of multiple personality (or manic depression, anxiety disorder, etc.) might have preceded the name, this is not Hacking's point. As a "way to be a person," multiple personality required a name that could index these *traits* and thereafter be a way of indexing *oneself* (e.g., "*that is me*"). Such a sequence (this is that → that is me) becomes fully reversible (*that is me* → *this is that*), which for our purposes implies a reduction in the degree of chance or guessing. A name, increasingly standardized, rationalized, and externalized, makes up and stabilizes people by feeding back into their identification (*this is that* ←→ *that is me*). To be a certain type of person, to live in society as that person, to be interacted with as that person, and most importantly, to experience oneself as that person occurs via a Hacking loop. These effects require only an external process rather than a change of "inner life."

What is interesting about Hacking loops, and why they are different from a more strict (non dynamic) nominalism, is that they are *descriptive*. A name is "deep" only in a contingent sense: the loop rests upon identifying those who are indexed. Still, it makes no substantive difference for the traits indexed that they now receive a name, apart from how descriptions serve as a range of possibility: how large it is, what is included, where the boundaries are, and what is expected. The looping mechanism here is akin to what the philosopher Elizabeth Anscombe called “action under a description.”[867] Externally imposed categories provide plausible descriptions of how action makes sense and, in doing so, it becomes an initial condition. Yet, it is possible, in Hacking’s view, for action to have autonomy from its description, to lead it around rather than the reverse. The *garcon de cafe* in France is “autonomous of any act of labeling.”[868] The description allows for a wide sphere of possibility for what can be expected of a *garcon*. A particular *garcon* can do things that no other *garcon* has ever done before, and they will still be a *garcon*. The “split personality” does not demonstrate the same action autonomous from its description: the expert control of the description is, in this case, the main vector for the loop, not the action oriented toward it. Every action of a “split personality” might fall under that description; yet the split personality has no say in this.

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[866] Ian Hacking, "Making Up People: Clinical Classifications," *London Review of Books* 28, no. 17 (August 2006): 78-90, quotation is on p. 80.

The main advantage Hacking adds for bringing out a loop is that action “under a description” includes a *future-orientation* with a horizontal dimension, which Hacking claims is what separates his type of loop from strict “labeling theory,” or even, we might presume, a discursive construction like Foucault’s *History of Sexuality*.[869] A description does not stabilize initial conditions by making them less sensitive to minute change; it links initial conditions and a distribution of probability together, even if the distribution changes. A descriptive loop is performative, we might say, but not without a repeating, two-fold connection of action and description, which for Hacking, in his nominalism, appears to start with the description but might eventually include a range of possibility that ranges far beyond what it indexed at the start. The mold or enclosure has a unique potential: it could make *all* future action fall under the label or category, or it could be limited to a small sphere. The *range* is the important thing, a point that Hacking draws in line with Anscombe’s emphasis on competing descriptions. So if one is diagnosed as “split personality,” then every action they subsequently take *could* fall within its range of possibility; this is dictated by the expert describer. Though when, say, a

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[867] G.E.M. Anscombe, *Intention* (Cambridge, MA: Harvard University Press, 2000/1957); G.E.M. Anscombe, “Under a Description,” *Nous* 13, no. 2 (1979): 219-233.

[868] Hacking, *Historical Ontology,* 168.

[869] Michel Foucault, *The History of Sexuality, Volume 1: An Introduction,* translated by Robert Hurley (New York: Vintage, 1984). Foucault emphasized a discourse mobilized by a will to truth, leading to a “subjection.” The difference is observable, in Foucault’s primary example (part 3), in the *scientia sexualis* versus *ars erotica*, with only the former leading to a kind of “turning back” on oneself and one's practices, and in this finding a subjectivity. Hacking’s descriptions can be truth bound but they do not have to be. They can also have no (deep) bearing on subjectivity, the lighter touch implied by simply “under a description” versus a “will to truth.” See also, Judith Butler, *The Psychic Life of Power* (Stanford: Stanford University Press, 1997), 3-4.

garcon de cafe asks us where we live as we drink coffee in the cafe, initially we may presume this is possible of *that* name, the *garcon*. Then we think twice about giving them the directions: why does *this person* (not this *garcon*) want my address?

Hacking loops, however, lack a key probabilistic element. It is not clear how the descriptions are learned; there is no attention given to subjective expectation. There is therefore a kind of parallel between Sewell and Hacking as they analytically specify a duality (schemas/resources and descriptions/actions) and then render this into a loop like form to break the dualistic opposition and its *mere* accidental connection. Sewell has no way of explaining how schemas and resources, in two different ontological registers, can *causally* interact. Hacking can account for this, at least partially, with a construct like "sphere of possibility," which has some analogue in action. An enclosure is a sphere (or range) of possibility; its *actual* form can be observed in actions under a description, which follow it around or which it leads.

Our point is this: the social world includes structures and enclosures; so, it takes the form of interpretive and descriptive loops. But even accounting for these loops, and enclosures and structures as looping effects, something is still missing. Viewed probabilistically, they both presuppose a loop that can itself emerge independently, in the absence of names, schemas or resources, one that we will emphasize plays an important role on its own, just as modulation, as we will claim, is important for all repeating and resonating loops, and therefore the social world as a whole. This is the *expectations-chances loop,* which we have claimed works according to a model that loops between (objective) prediction and (subjective) guessing.[870] And it is this loop, *sans* names or schemas, that comes to fruition in the interface of machine and social learning, specifically in the data-based arrangement of experience.

Probability Loops

A probabilistic loop finds the simplest relation between initial conditions and outcome because it does not seem like there are any initial conditions or any outcome. The links are not as clear, so it does not seem like action unfolds within a range of possibility, its limits, and its connection of past and future. Yet, not only are these loops essential to all others, they are also now more readily observable on their own, in a more *purely* probabilistic form. Order can appear in the social world without interpretation or description acting as a control on objective possibility, which stands out as more evident and observable when they do. Objective possibility can, instead, be modulated by rendering the *logical* connection between initial conditions and outcomes into data, then augmenting it in a way that repeats, but also drifts in ways we cannot anticipate. Probabilistic loops, while they are elemental to all social order, are, on their own, far more unexpected; though internally, they work with the highest degree of control.

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[870] Pierre Bourdieu, "Three Forms of Theoretical Knowledge," *Social Science Information* 12, no. 1 (1973): 53-80, see especially p. 64.

In one version of this loop, the tale is told indicatively as follows:

> Acrimonious debates about the calculative abilities of individuals and the limits of human rationality have given way to an empirical matter-of-factness about measuring action in real life, and indeed in real time. The computers won, but not because we were able to build abstract models and complex simulations of human reasoning. They bypassed the problem of the agent's inner life altogether. The new machines do not need to be able to think; they just need to be able to learn. Correspondingly, ideas about action have changed.[871]

Here, a proposal for non-intentional action becomes applicable to data-gathering mechanisms, but the "index" is rather different in this scenario, as it requires no description. Meanwhile, "culture" becomes more akin to an association rather than a worldview, landscape of meaning or internalized pattern generator like a schema. It does not interpret; it rather stands for a history of traces:

> When people are presumptively rational, behavioral failure comes primarily from the lack of sufficient information, from noise, poor signaling or limited information-processing abilities. But when information is plentiful, and the focus is on behavior, all that is left are concrete, practical actions, often recast as good or bad 'choices' by the agentic perspective dominant in common sense and economic discourse. The vast amounts of concrete data about actual 'decisions' people make offer many possibilities of judgment, especially when the end product is an individual score or rating. Outcomes are thus likely to be experienced as morally deserved positions, based on one's prior good actions and good taste.[872]

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[871] Marion Fourcade and Kieran Healy, "Seeing Like a Market," *Socio-Economic Review* 15, no. 1 (2017): 9-29, quotation is on p. 24.

[872] Ibid, 24.

A theory of action remains, then, even despite the absence of inner life—because *action is simply data*. Data can modulate action through a "herding" or directing effect: targeting some initial conditions by their link to outcomes, constructing new parameters based on current action, taking these as initial conditions, feeding them forward into outcomes, and so on. This creates futures based *entirely* on past performance and subsequent encoding. In principle, a purely probabilistic loop could render anything an initial condition. It could remove the objective possibility from anything that seems to have it by nature. Since there is no inner life of concern, digital classification is based on information collected at junctures of possible futures. The causes of action are not of interest; all that is of interest is that action happens and is datafied.

Predictions made through data protocols interface with predictions made in action. Tests here do not involve the uncertainty whether an interpretation can increase the objective possibility that something happens, neither are they found at the interface of description and action, which one sets the terms of the other; rather, tests are simply data vectors in which some initial conditions are set as opposed to others, opening a specific range of possibility. A certain future is achievable when possibilities are presented algorithmically and displace what, by comparison, is a "wild" cognition of uncontrolled looping and basic active inference in which initial conditions are simply prior experience. Control becomes an algorithmic modulation of future possibilities rather than a generative modulation of guesses. The systematic production of "good matches" is based on controls exercised on the means of prediction from both ends: the expropriation of the means of prediction and the controlled distribution of what they predict. This keeps the loop closed between the (objective) provision of possibilities and (subjective) anticipations or guesses, which is what makes "this matching feel all the more natural because it comes from within—from cues about ourselves that we volunteered, or erratically left behind, or that were extracted from us in various parts of the digital infrastructure."[873]

As opposed to a structure or an enclosure, a modulation is more dynamic and of subtler presence. It requires no apparent expertise or authority. Rather, it arises as a "self-deforming cast that will continually change from one moment to the other, or a sieve whose mesh will transmute from point to point."[874] An expectations-chances loop finds no equivalent to interpreting or describing, as the key process is *guessing* instead, the tool of basic cognition. A non-individual recorder or record-keeper can guess even if it cannot read, and it can adapt its guesses, improve them. As Hacking suggests, you can know when you leave an enclosure and its description no longer applies. The same is true of a structure, particularly if you try to actualize a possibility not opened by interpretations that keep stable links between initial condition and outcomes (like, say, inventing your own ritual in the middle of a Catholic church). The same boundaries are less evident in a modulation as the initial conditions are not external and do not seem arbitrary or contingent in the same sense.

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[873] Fourcade and Healy, "Seeing Like a Market," 17.

The theory of power embedded in a schema-resources loop puts the onus on schemas that "read" resources; this is where we find agency. In a disciplinary context, an ideal or standard (a telos) is enforced and sought after. In the more basic contexts of control evident in an expectations-chances loop, such a standard goes missing. Tests are not examinations. A model is *volunteered* rather than enforced. An individual is a record, though there is no record-keeping individual ("examiner" or "recorder"). Rather than being incorporated into a structure (through schemas), agents are made precise as a code or classification.[875] They do not exercise effects (structural or otherwise) but are given possible futures. They are not shoehorned into the fixed parameters of a schema. They bootstrap themselves into sequences that look increasingly like their own good matches. We should therefore expect the genesis and transposition of expectations just as we do those of schemas or nominal labels, in looping connection with chances, as a way of inviting chance in or taming it.

But there is a catch. The consequence of a "controlled" expectations-chances loop can be like the amnesiac returning to memory after several long years: "My God! What did I do in all those years?"[876] Consider, along exactly similar lines, a "coming to" after diving down an algorithmically modulated rabbit-hole. In this case, the connection between initial conditions and outcomes is almost entirely unmediated as objective possibility approaches *1*: whatever is contained in initial conditions will be realized as outcomes. But, as these examples might convey, this can typically (though due only to data constraints) only work on narrower and narrower grounds. Rabbit-holes will have a theme, after all, though we cannot tell what it could be in advance. Instead, they build iteratively. Anything could serve as an initial condition; in time, anything could become an outcome.

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[874] Gilles Deleuze, "Postscript on Societies of Control," *October* 59 (1992): 3-7, quotation is on p. 4.

[875] The difference, here, is capture by Gilles Deleuze and Felix Guattari (*A Thousand Plateaus*, 458) as follows: "For example, one is subjected to TV insofar as one uses and consumes it, in the very particular situation of a subject of the statement that more or less mistakes itself for a subject of enunciation ('you, dear television viewers, who make TV what it is . . .'); the technical machine is the medium between two subjects. But one is enslaved by TV as a human machine insofar as the television viewers are no longer consumers or users, nor even subjects who supposedly 'make' it, but intrinsic component pieces, 'input' and 'output,' feedback or recurrences that are no longer connected to the machine in such a way as to produce or use it. In machinic enslavement, there is nothing but transformations and exchanges of information, some of which are mechanical others human." The reference to input-output and feedback evokes the mechanical loops of machine learning and algorithmic interface. As we articulate below, as replicated in an algorithmic interface this loop removes all adequacy from causation, and we end up with something akin to *fatelessness*.

[876] Pierre Bourdieu, *The State Nobility: Elite Schools in the Field of Power* (Stanford: Stanford University Press,

The Continuity Frame

Loops have become a common way analysts try to avoid nominalism about structure, identity, and groups. However, we encounter discontinuity here as well: if we describe these objects using a probabilistic language, sociologists do not allow them to be probabilistic in any more than an epistemic sense. Even recognizing loops as continuously generating the effects of what would otherwise seem fixed or "self-acting," sociologists remain in sole possession of the predictive qualities that can be ascribed to an institution, identity, group, or network.

For empirical research, probabilistic sociology, therefore, recommends we apply a *radical continuity frame* to our understanding of collective objects and social formations of every sort, and this means something very specific. Sociologists often assume a schematic interpretation must come *first* as part of the following sequence: *Interpretation → Perception → Action*. For instance, we can find this in the argument that schemas are the first step in the formation of social structure because they "read" resources,[877] or the argument that before social action can occur an "interpretation" must ensure that the action unfolds in a meaningful landscape.[878] Reading and interpreting, as we have argued, assume such a seemingly irreplaceable role in empirical sociological research in part because prediction has been conceptually severed from action. Suppose, instead, we follow the continuist rubric mentioned above and try to understand what such an explanatory sequence would involve.

If what we are setting out to explain is a structure or system to which we ascribe certain predictable qualities, then we cannot deprive people of having expectations and interfacing with these

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1996), 385. Here Bourdieu draws from Deleuze, *The Fold: Leibniz and the Baroque* (Minneapolis: University of Minnesota Press, 1993).

[877] Sewell, "A Theory of Structure," 17.

[878] Isaac Reed, *Interpretation and Social Knowledge* (Chicago: University of Chicago Press, 2011), 135.

objects, in some form, as sources of their own predictions. What comes first, then, are attempts to adapt, via anticipation, to the probabilistic structure of the environment: from some initial conditions to some outcomes, linked by action. So, we get a horizontal sequence like this instead: *Action* → *Perception* → *Interpretation*. Interpretation and perception do not need to enter action directly or as a precursor; they are instead an initial condition, or the mismatches of our guessing future states (outcomes). Action comes first, and what we perceive are the *differences* between our expectations and the world's probabilistic states, the range of possibilities allowable within certain initial conditions, as made evident by the outcomes of our action (equivalent to dice rolls and dice returns). We are subsequently led forward to either adapt to or eliminate these errors, which could mean leaving a probabilistic order entirely, no longer orienting toward its range of possibilities.

A continuous sequence, thus, seems entirely scrambled relative to a largely folk understanding. Rather than drawing on the past to anticipate a yet-to-occur future in an immediate present (e.g., a sequence like *Past* → *Present* → Future) the future, in a first step, draws on the past to generate a present (*Future* → *Past* → *Present*). Note the close connection between this account of a basic chance-expectation loop (and the nested action-perception loop) and the radical continuity thesis. Continuity in this or in any other explanation means action cannot *only* work at the horizontal level of an unfolding narrative-like process at the personal level. It must have been "captured," as we have argued, which in the basic rendering of the probability loop: we do not continue horizontally with no orientation that we could identify as within an enclosure, structure, or modulation. But when it is captured, the sequence in question can be situated relative to certain initial conditions and horizontal action unfolds as a loop; when we act according to certain initial conditions, we do so in a way that presumes they will be present in the next instant.

If attention becomes "present" via such non-linear temporal loops, what can we observe of objective probability using qualitative methods? This is a question all too familiar to phenomenologists, and those adopting a social-phenomenological approach to action theory.[879] Ditto for those influenced by the American pragmatists whose emphasis on the qualitative character of personal experience was pivotal.[880] Even analysts opting for objective probability over phenomenology also tend to describe action-environments in terms rich with qualitative immediacy. Probabilistic sociology does not lose track of the qualitative structure of experience but adds a missing ingredient. Qualities like "hope," "foreboding," "danger," "blocked horizons" and the like reconstitute action environments as real possibilities, neither subjective nor objective, but instead rooted in expectation. If we pursue this qualitative physiognomy in our research, it might seem restricted to potential predicates of what we have referred to as a personal explanation. As data, these qualities might seem to lack objectivity, presenting as simply a "feel," "belief" or "thought."

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[879] Mustafa Emirbayer and Ann Mische, "What is Agency?" *American Journal of Sociology* 103, no. 4 (1998):962-1023; Iddo Tavory, "Between Situations: Anticipation, Rhythms, and the Theory of Interaction," *Sociological Theory* 36, no. 2 (2018): 117–133.

A probabilistic approach, however, offers a conceptual framework to understand them as attributes and evidence of a *subpersonal relation* (expectation-chance loop) between agents and the world, cutting across levels of perceptual content, concealing a relative attunement or adjustment (or lack thereof) to what is probabilistically *likely* to happen within a given situation. Dispositionally, these qualities show actors what their chances are relative to the average chances that they have become accustomed to predicting. This is not to say that actors are making *accurate* predictions: as we have tried to show, this is beside the point. The point, rather, is that making predictions, having the qualitative experience of probability, is non-negotiable: it is a part of action. We can recalibrate our methods and explanations to make this presence of probability in action and experience, both personal and subpersonal, empirically observable. And the sources for expectations, the ways of being oriented to *Chance*, and what kinds of *Chance* to be oriented to are not limited or narrowly conceived.

Consider the following example from Du Bois, which seems to apply his own earlier call for a sociology that will study "rhythms."[881] In a memorable passage from *Souls of Black Folk*, Du Bois draws attention to the "sorrow-song" and "its plaintive rhythmic melody, with its touching minor cadences" as having "sprung from the African forests, where its counterpart can still be heard, it was adapted, changed and intensified by the tragic soul-life of the slave, until, under the stress of law and whip, it became one true expression of a people's sorry, despair and hope."[882] Here, musical rhythms and probabilistic rhythms coincide, ensuring the continued sustenance of the creative expression of a people even across the most traumatic of disruptions. Probabilistic sociology draws attention to, and, in a sense, *redeems*, this kind of claim as being substantive in the following sense: a musical rhythm provides an orientation that can suspend and look beyond the immediate, empiricist reality, even of brutality, and find environments of hope and solidarity in real ranges of possibility. [883]

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[880] Alessandra Lembo, ""Three Chords & (Somebody's) Truth: Trajectories of Experience and Taste Among Hard Country Fans," *Poetics* 60 (2017): 62-75; John Levi Martin, *The Explanation of Social Action* (New York: Oxford University Press, 2011).

[881] Du Bois, "Sociology Hesitant."

[882] W.E.B. Du Bois, *The Souls of Black Folk* (New York: Oxford University Press, 2007/1903), 191.

Such an argument is compatible with vertical continuity, emphasizing the predictive aspects of subpersonal processes. The "sorrow-songs" are a different source of continuity, a different loop, that structures time differently, opens other possibilities, presenting a range or continuum in which *different outcomes* should come next based on these novel initial conditions. Du Bois identifies probabilistic schemes in the form of a musical rhythm that wager on a future while remaining oriented toward probabilities that have been made all too objective. He thus describes a form of *transposition*, but not in the sense of transposition of content-based "schemas" or "logics."[884] Transposition assumes a probabilistic form as the present-time lived experience of hope. A focus on rhythm is a focus on the transposition of *expectations to chances*, with the songs the source of novel chances, and thus the source of embodied hope. Those who sing the sorrow songs can perceive what they expect to perceive in a manner contradicting expectations within the form of domination to which they are subject as a different *orientation.*

What is Action For?

Each of these arguments focuses our attention squarely on *action*, then, though much differently than suggested in contemporary theory. As some sociologists have noticed, the post-Parsonian era forces a question upon us that we did not anticipate after mostly abandoning the project of developing a general theory of action: namely, *what is action for?* Action has relevance for sociological research today mainly as an interpretive bridge for empirical correlations, most often ones that are first discovered via frequentist statistics. To "explain correlation" with a more contained or gear-like *mechanism* is what action is generally *for* in contemporary sociology, inclusive of the varying ways of conceptualizing action.[885]

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[883] A relevant cognitive mechanism is found in musical rhythm's "capacity to create an environment of minimized prediction error within individuals and within groups." See Rebecca Schaefer, Katie Overy and Peter Nelson, "Affect and Non-uniform Characteristics of Predictive Processing in Musical Behavior," Behavioral *and Brain Sciences* 36, no. 3 (2013): 226–245.

[884] Sewell, "A Theory of Structure"; Patricia Thornton, Willam Ocasio and Michael Lounsbury, *The Institutional Logics Perspective: A New Approach to Culture, Structure and Process* (Oxford: Oxford University Press, 2012).

In recent years, pragmatism has become adept at playing the role of generic *post*-theory for contemporary sociology because it can punt on such a question.[886] As Richard Rorty once put it, in explicit denial of theories of action that gave action an orientation beyond having only "practical consequences" (as in Peirce's famous formula), without a "metaphysical or epistemological guarantee of success […] we do not know what 'success' would mean except simply 'continuance.' [For instance] we are not conversing because we have a goal, but because Socratic conversation is an activity which is its own end … [The] conversation which it is our moral duty to continue is merely our project."[887] By orienting strongly to the practical situation itself, a pragmatist can respond to the question "what is action for?" by referencing nothing suggesting a vertical content like a social structure or the subpersonal fulfillment of an expectation. Ends and means are always "in view" or within the frame of a "project," which is to say, always within the horizon of the practical situation.[888] They are neither higher nor lower on any scale that does not have a direct analog within the practical situation. Hence, we get a deflationary response: *action is for the continuation of action*, or at most the continuation of a project.

This is an effective post-Parsonian move, as evidenced by the wide influence of pragmatism in sociological research for at least the last three decades. In cognitive science, by contrast, predictive processing has made action an empirical venue for developing a general theory of perception and cognition, which in some sense resembles what action used to be in sociology.[889] Probabilistic sociology suggests that such a general concern with action can be empirically useful. Sociologists do not need to be such deflationists to avoid the failings of action theories of the past. Beyond this, sociologists *need* to provide a more substantive answer to what action is for that surpasses these comparatively narrow criteria lest data science simply displaces this concern by making theories of action irrelevant or antiquated. According to probabilistic sociology, action is for something, and what it is for, *apropos* of pragmatism, is not something transcendent of action, or not without practical consequences. However, to call this mere "continuance" or project misses a more basic and inclusive form of action, one that can easily be missed by a focus on pragmatist problem-solving.[890]

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[885] Peter Hedstrom, *Dissecting the Social: On the Principles of Analytical Sociology* (Cambridge: Cambridge University Press, 2005); Carly Knight and Isaac Reed, "Meaning and Modularity: The Multivalence of 'Mechanism' in Sociological Explanation," *Sociological Theory* 37, no. 3 (2019): 234-256.

[886] Richard Bernstein, *The Pragmatic Turn* (London: Polity Press, 2010), 205.

[887] Richard Rorty, "Pragmatism, Relativism and Irrationalism," in *Consequences of Pragmatism: Essays 1972-1980* (Minneapolis: University of Minnesota Press, 1982), 172.

[888] Ann Mische, "Projects and Possibilities: Researching Futures in Action," *Sociological Forum* 24, no. 3 (2009): 694-704; Iddo Tavory and Nina Eliasoph, "Coordinating Futures: Toward a Theory of Anticipation," *American Journal of Sociology* 118, no. 4 (2013): 908-942.

[889] Andreas Engel, Alexander Maye, Martin Kuthen and Peter König, "Where's the Action? The Pragmatic Turn in Cognitive Science," *Trends in Cognitive Science* 17, no. 5 (2013): 202-209.

Despite this centrality, however, nowhere is "problem" given specific analytic attention, outside being defined as that which forbids action's continuation. Predictive processing, by contrast, brings out this continuation explicitly. Why, for instance, is *inaction* impossible?[891] The assumption that action *occurs* remains one of the least questioned assumptions in revisionist attempts at a theory of action. If we do question it, this reveals a whole host of assumptions made about the conditions under which it can be said that action does take place, particularly about time and sequence, as we have suggested. These assumptions are made because the explanatory locus (post-Parsons) cannot remain at an objective level of description, as it were, from the outside.

In this way, action must occur for the observer on the same terms that it occurs for agents. This invites a host of new terminology that ultimately appeals to a naive action theory (e.g., invoking tropes like "effort"). "Problem" qualifies (at least partially) as part of such terminology. It remains at the core of the pragmatist reframing of action theory. Yet certain questions proliferate that almost seem too elementary to answer: How are problems identified? What does it mean for problems to be solved? How does a "solution" solve a "problem"? These questions tend to arise in a pragmatist framing because, in a very general sense, it constitutes a direct challenge to anything labeled as "absolute." In Hans Joas' original adaptation of classical pragmatism to a theory of action, he introduces the argument for what it means to "reconstruct an interrupted context" as the restoration of action to a state of habit or "unreflected belief."[892] In subsequent arguments for a pragmatist theory of action, Joas' notion of "reconstruction" tends to merge with what appears in a more contemporary sense as problem-solving.

For example, in Mustafa Emirbayer and Ann Mische's treatment of agency, the "interactive response to problematic situations" becomes a critical feature because it provides a way to explain variations in creativity.[893] However, a specific analysis of why action would occur *for* problem-solving remains unanswered, as they subtract Joas' original focus on restoring unreflected belief. In Neil Gross' later argument, action becomes meshed with "chains of habitual responses to problem situations."[894] For Gross, the appearance of problem situations often arises through the "lens of a cultural environment," and he suggests that "identity, morality and tradition" can be factors that lead to the adoption of a given social practice.[895] This would also provide a telos to action in a manner different from Joas' "restoration of habit" argument. For Terence McDonnell, Christopher Bail and Iddo Tavory, on the contrary, problem-solving becomes more generally applicable to the *resonance* of cultural objects that are "not relevant unless employed to solve a problem."[896] They draw attention to the ambiguous relation between "problem" and "solution" and emphasize a more circular (rather than sequential) relation between the two. Problem-solving may consist of solving a problem or applying a solution in no particular order. To "resonate," it is not enough that a given cultural object be "congruent with actors' ways of seeing the world."[897] Resonance, instead, remains conditional on the practical situation that actors' "puzzle out, or 'solve.'"

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[890] Terence McDonnell, Christopher Bail, and Iddo Tavory, "A Theory of Resonance," *Sociological Theory* 35, no. 1 (2017): 1-14.

[891] Karl Friston, Christopher Thornton and Andy Clark, "Free-Energy Minimization and the Dark-Room Problem," *Frontiers of Psychology* 3, no. 130 (2012): 1-7.

[892] Hans Joas, *The Creativity of Action* (Chicago: University of Chicago Press, 1996), 126.

This framing is similar to what Emirbayer and Mische, departing also from a pragmatist perspective, describe as a "projective capacity to imagine alternative possibilities … to [formulate] projects for the future."[898] Projectivity refers to "the imaginative generation by actors of possible future trajectories of action, in which received structures of thought and action may be creatively reconfigured in relation to actors' hopes, fears, and desires for the future."[899] They distinguish this from the "practical-evaluative element" of agency, which involves the related "capacity of actors to make practical and normative judgments among alternative possible trajectories of action, in response to the emerging demands, dilemmas, and ambiguities of presently evolving situations." They further distinguish projectivity from the "iterational element" of agency that involves the persistent

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[893] Emirbayer and Mische, "What is Agency?," 970.

[894] Neil Gross, "A Pragmatist Theory of Social Mechanisms," *American Sociological Review* 74, no. 3 (2009): 358-379.

[895] Ibid, 367-68.

[896] McDonnell, Bail and Tavory, "A Theory of Resonance," 3.

[897] Ibid, 4.

[898] Emirbayer and Mische, "What is Agency?," 964.

[899] Ibid, 971.

"reactivation of the past patterns of thought and action, as routinely incorporated into practical activity."[900]

Each of these are constitutive elements of human agency, and so each of them "structures [the] interactive response to the problems posed by changing historical situations."[901] "Alternative possibilities," "possible future trajectories of action," "alternative possible future trajectories of action": all of these also derive from interaction with a practical situation. This is not unlike what McDonnell, Bail and Tavory propose in tying resonance not to "[congruence] with an actor's way of seeing the world" but instead to practicality vis-à-vis "solving an ongoing challenge" and specifically, how it helps an actor "'puzzle out'" a particular world.[902]

The Limits of Pragmatism

Pragmatists connect problem-solving with qualitative experience with a concept like "resonance," but in attempting to make such a translation, we reach the limits of pragmatism, and we open the door to a more substantive theory of action. The interesting thing is that in more classical pragmatism, we do not find the same limitation as often. This could be because classical pragmatists did not observe the severance of action from prediction (and interpretation from probability). For example, in George Herbert Mead's vivid stream of consciousness portrayal of problem-solving, a "puzzling through" is fed forward by what seems to be a loop-like passage through time, contingent on making predictions, reducing surprise, and engaging in what a probabilist refers to as vertically captured horizontal movement, which is (typically) *very* socially constructive.

> The kaleidoscopic flash of suggestion and intrusion of the inapt, the unceasing flow of odds and ends of possible objects that will not fit, together with the continuous collision with the hard, unshakable objective conditions of the problem, the transitive feelings of effort and anticipation when we feel that we are on the right track and substantive points of rest, as the idea becomes definite, the welcoming and rejecting, especially the identification of the meaning of the whole idea with the different steps of its coming to consciousness…If there ever was a psychical feeling of relation, it is when the related object has not yet risen from the underworld. It is under these

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[900] Ibid, 971.

[901] Ibid, 970.

[902] McDonnell, Bail and Tavory, "A Theory of Resonance," 12.

> circumstances that identities and differences come with thrills and shocks … And it is in this phase … with its activities of attention in the solution to the problem…that the individual has his functional expression or rather is that expression.[903]

Much of what Mead describes here is difficult to account for should our attention remain concentrated on personal explanation. But as we alluded to above in our revisionary approach to abduction, a subpersonal process is necessary for the "inferential principles" of problem-solving, something which Mead indirectly indicates here (e.g. "the underworld"). "Puzzling through" is both led forward, in this regard, but also "vertical" in probabilist terms, both subpersonal and upward, into a more general space (e.g. of generalized others). This engagement—vertically orientated, subpersonal, with a horizontal direction—seems to require an equivalent aspect of *prediction* in action. We body forth a gambling guess, as we try to asymptotically approach something like objective possibility. We solve a problem by looping in, by learning how to make the right anticipations, and the practically "correct" predictions based on the signs present to us.

Such emphasis on the process of "puzzling through" leaves a pragmatist broadly committed to a personal explanation of action that features a subpersonal process at work that would remain phenomenologically opaque and also necessary for what is qualitatively immediate (e.g., the experience of qualities as in the world). Typically, however, pragmatism commits only to the experience of the experiment itself or creativity in which the outcomes appear before our eyes and through our own initiative. It does not seem to admit that fulfillment through creative problem-solving can only *indirectly* enter into the experience, as most contemporary pragmatist accounts imply (often by resorting to something equivalent to the contingencies of interpretation). Perception is not just spectatorial or contemplationist, however, but serves as the "initial stage" in a dynamic action cycle that, in probabilist terms, is objectively possible within some initial conditions. Perception is *for* something, in other words, and it is linked to anticipation, prediction and ultimately to action. We can draw a similar pragmatist message in a bottle to this effect from John Dewey.

In Dewey's words, "the terminal outcome when anticipated (as it is when a moving cause of affairs is perceived) becomes an end-in-view, an aim, purpose, a *prediction* usable as a plan in shaping the course of events."[904] In a stronger sense, for Dewey perceptions are predictions, which in their turn appear in practical experience as ends-in-view. Perceptions are "projections of *possible* consequences; they are ends-in-view. The in-viewness of ends is as much conditioning by antecedent natural conditions as is perception of contemporary objects external to the organism, trees and stones or whatever."[905] For Dewey, this can extend even further into what arguably remains his most influential contribution to pragmatist thought: the general process of *inquiry,* as it "enters into every aspect of every area" of life.[906]

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[903] George Herbert Mead, "The Definition of the Psychical," in *George Herbert Mead: Selected Writings,* edited by Andrew Reck (Chicago: University of Chicago Press, 1981/1903), 42.

Inquiry, as Dewey defines it, is the "controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole."[907] The "indeterminate situation" that provides antecedent conditions for inquiry is constituted by doubt, but as Dewey continues, this is not a purely subjective state ("in us"). Doubt refers to our placement in a situation that is doubtful because we cannot respond to it as we are accustomed: "the particular quality of what pervades the given materials, constituting them a situation … is a unique doubtfulness which makes that situation to be just and only the situation it is."[908] Specifically this means that we cannot form ends-in-view with respect to the situation, though we can "[respond] to it … [in] blind and wild overt activities." As Dewey stresses, "it is the situation that has these traits," which means that we are simply a part of the situation in being doubtful; one part of the total configuration. To simply "change our mind" with respect to the doubtful situation is hardly enough to change it, though with any indeterminate situation we might respond by carrying through a "withdrawal from reality." The only thing that will be effective (e.g. to "solve" the problem) is what Dewey calls a "restoration of integration" in which the situation changes as we change *within* it.[909]

Underlying Dewey's proposals is a kind of cognitive mechanism, which he does not label outright, but which, likewise, involves prediction or systematic guessing, and on which the stages of inquiry appear to rest in their horizontal, loop-like momentum. For Dewey, it is possible to remain in a doubtful situation forever should you find an effective means of "withdrawing from reality."[910] The next stage in the process of inquiry will only occur through a change in "cognitive operations," specifically what Dewey labels "the institution of the problem … The first result of evocation of inquiry is that the situation is taken, adjudged, to be problematic. To see that a situation requires inquiry is the initial step in inquiry."[911] The constant in this process are successive forms of prediction that, in Dewey's terms, is trying to obtain an end-in-view—this we take to be essentially like *looping in*, and here it is present at the heart of pragmatist action theory's core theme.

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[904] John Dewey, *Human Nature and Conduct* (New York: Henry Holt, 1922), 101, emphasis added.

[905] Ibid, 102.

[906] John Dewey, *Logic: The Theory of Inquiry* (New York: Holt, Reinhart and Winston, 1938), 101.

[907] Ibid, 104-05.

[908] Ibid, 105.

[909] All quotations in ibid, 106.

This kind of framework, alongside Mead's vivid account, filters into all subsequent understandings of pragmatist problem-solving; yet contemporary pragmatist action theory favors instead a focus on problem-solving seemingly without any vertical connection or any attention to looping in, an omission that begs the above basic questions: Why are "problems" identified? How is a problem "solved"? What motivates a "puzzling through"? If Dewey and Mead are right, then to make problem-solving vertical and continuist, in our sense of the word, would require adopting a heretical view: it would require putting non-statistical (and non-subjective) prediction, or the guessing of what is probable based on one's past experience, into action.

As we have argued, prediction in this sense does not require frequency counts, though this does not mean that it is a hopeless cognitive bias, to be removed from practice with more careful attentiveness to its heuristic danger.[912] Prediction is not "subjective" in the disparaging sense of the word typical on this side of the Comtean divide. Classical pragmatism appears to appreciate this point, likely as the development of themes from Peirce's own transition from frequentist to probabilist, which coincided with his development of many of the core pragmatist concepts. Though, likely too, the ambiguity over prediction in pragmatism stems from Pierce's own ambiguity about propensities, or the source of observable and measurable probabilities, only becoming clear as frequencies "in the long run," as opposed to as *Chance*, or propensities that emerge from probabilistic judgment relative to some initial conditions (or *Spielraum* in Kries' terminology). According to a probabilist, learning probability and counting frequencies are two different things. The limits of pragmatism revolve, fundamentally, around not finding the two as distinct.

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[910] Ibid, 107–08.

[911] Ibid, 107.

[912] In the tradition of Daniel Kahneman and Amos Tversky. See, particularly, their less well-known, "On the Psychology of Prediction," *Psychological Review* 80, no. 4 (1973): 237-51.

Probability in Action

For a probabilist, then, *action is for orientation*. It is both for *gaining* an orientation to a probabilistic world and for *maintaining* the orientations we already have. In a cognitively robust sense, we have theorized this as developing generative models and minimizing predictive errors, with action serving as a venue for active inference. If the brain needs to guess what our experiences are based on the sense impressions it receives about the world around us, then our social explanations must be consistent with this basic prerogative. To be "oriented," then, means to have expectations that find a counterpart in something objectively probable about the world. Sensory input can never entirely be expected in probabilistic environments, where initial conditions connect to outcomes but not with mechanistic determination, where signs always appear *partial* to us, requiring that we guess what they mean, what continuum they are part of, what actions they describe, or what initial conditions they interpret. Guesses will always have errors that need to be eliminated (or "canceled"), requiring us, across multiple levels and timescales, to bring the world in line with our expectations or our expectations in line with the world. This is just another way of saying that without *Chance* there will be no action: the only question is whether and how *Chance* is specified.[913]

But far from supporting a cognitively "smallist" perspective, its explanatory reach limited to a skull-size kingdom, probability in action links micro and macro, in the old locution, as prediction errors and generative models emerge at the interface with *Spielraum* or probabilistic orders with various, and often spatially wide and temporally long, ranges of possibility. As we have argued, social formations partake of the Aristotelian "activity of being": they are potentials made actual in action. We have updated and adapted that view as *probability in action*, as an appropriate framing of the social world, which finds its most fundamental form in repeating loops of expectations and chances. For a probabilist, such a loop is only ever with a tendency, not a deterministic certainty; because it is not final, it must be continually engaged. Orientation to a ranges of possibility, participating in the activity of being, can be intuitively captured in the very fact of having expectations, feeling bound by them, experiencing hope (or ominous foreboding) according to them, or engaging in presumptuous action; this shows evidence of being oriented to probability in a single-case sense, without the need of frequency counts. Regardless of whether sociologists interpret action as the performance of cultural meaning or the "enaction" of institutional scripts,[914] pursuing a desire based on a belief,[915] motivation to realize a value,[916] or solving a problem—to reference a few of the most prominent accounting schemes—only basic, probabilistic action retains an emphasis on what we have called both *horizontal* and *vertical* continuity, which tries to formulate the link between action and probabilistic order at any scale. For probabilistic sociology, the key is to keep action *fluid*, shifting between orientations quickly, repeating loops, always oriented to probability, but to *different* probabilities, with different orientations.[917]

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[913] Erving Goffman suggested much the same in a famous essay rarely appreciated for its action theory: "A decade ago among those urban American males who were little given to gentility the term 'action' was used in a non-Parsonian sense in reference to citations of a special kind, the contrast being to situations where there was 'no action' … Wheresoever action is found, chance-taking is sure to be … When persons go to where the action is, they often go to a place where there is an increase, not in the chances taken, but in the chances that they will be obliged to take chances." Goffman, "Where the Action Is," in *Interaction Ritual: Essays on Face to Face Behavior* (New York: Anchor Books, 1967), 149, 269.

Thus, when it comes to moving our explanations beyond correlation, we do not need to leave probability behind, nor can we claim to have explained action if we *do* leave it behind. We can use correlations to move vertically from aggregations of data points (e.g., race as a variable linked to a multiplicity of outcomes) to social action maintaining the objective probability of a given social order (e.g., a racialized social structure). Correlations assign quantitative meaning to probabilities toward which actors could be oriented. Actors incorporate probability into social action by attuning to objective *Chance*, based on internalized probabilistic models of the social world, and acting to fulfill what they expect by eliminating or adapting to the errors that they perceive.

The tendencies of probabilistic orders to ensure their continuous reproduction are sustained by the investment of actors in those very regularities that allow them to predict and anticipate on a moment-by-moment basis. This allows analysts to examine how anticipation and, more specifically, classification, are evidence of probability-in-action, akin to a description loop. The "best classified" of the properties that describe individuals and actions are those that carry the most "infamy, stigmata, especially the names and titles expressing class membership whose intersection defines social identity at a given time—the name of a nation, a region, an ethnic group, a family name, the name of an occupation, an educational qualification, honorific titles and so on."[918] These classifications serve as the basis for "appropriating practices and properties" according to a "probable distribution between groups that are themselves classified." This distribution precedes the appropriation, which does not unfold in a random space. The classification is a matter of probability, rather, which means that the appropriation is *also* a matter of probability.

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[914] Jeffrey Alexander, "Cultural Pragmatics: Social Performance Between Ritual and Strategy," *Sociological Theory* 22, no. 4 (2004): 527-573; Ron Jepperson and John Meyer, *Institutional Theory: The Cultural Construction of Organizations, States and Identities* (Cambridge: Cambridge University Press, 2021).

[915] Hedstrom, *Dissecting the Social.*

[916] Andrew Miles, "The (Re)genesis of Values: Examining the Importance of Values for Action," *American Sociological Review* 80, no. 4 (2015): 680-704.

[917] Max Weber, *Economy and Society: A New Translation,* translated by Keith Tribe (Cambridge: Harvard University Press, 2019/1921-22), 100ff.

Probabilistic sociology draws attention to this by arguing that the appropriation of practices and properties occurs according to "classificatory schemas analogous to those which enable [actors] to more or less adequately *anticipate their own classification*."[919] What is classified by a probabilistic distribution is appropriated by those who can *anticipate* how they will be classified by their appropriation. They can, in other words, *predict* it, and there can be an affirmation or deviation based on this prediction. Social psychologists have often inferred such anticipation as a continuously maintained social identity.[920] This suggests that social identity involves anticipation, as an orientation to probabilistic distributions allows for the anticipation of classification, rather than classifications being a simple label or name. Since we are constantly making predictions about the world at multiple timescales, we loop into objective probabilities of all kinds, including those involving repetitive, "pointless" action, like fidgeting, whose only purpose appears to be reminding the brain that it is still part of a body.[921]

A probabilist would argue, then, that not only do objective probabilities *cause* expectations but that the reverse is also true: expectations cause objective probabilities.[922] As alluded to above, probabilistic sociology ascribes causal powers to chances, but this requires a distinction between adequate cause and chance cause, which in turn implies some boundary-making formation like a probabilistic order that can create and maintain the distinction between the two. Adequate causes, in the Kriesean (via Spinoza) rendering, are always linked to expectations, though we must stop ourselves from assuming they are purely subjective guesses—if they were, they could only *rarely* have practical consequences, and only because of a lucky guess (or loop). As historically emergent "islands of uniformity, stability and predictability," loops feature distributed outcomes that are persistent, learned, and maintained orientations in action.[923] Hence, whatever else might make certain probabilistic distributions objective, action (as anticipation and expectation) *needs* to loop into them if they are to be maintained horizontally and thus be capable of having effects that we (the analyst) can predict with any consistency over time.

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[918] Pierre Bourdieu, *Distinction: A Social Critique of the Judgment of Taste* (Cambridge: Harvard University Press, 1984), 482.

[919] Ibid, 482.

[920] Jan Stets and Peter Burke, "Identity Theory and Social Identity Theory," *Social Psychology Quarterly* 63, no. 3 (2000): 224-237.

[921] Kelsey Perrykkad and Jakob Hohwy, "Fidgeting as Self-Evidencing: A Predictive Processing Account of Non-Goal-Directed Action," *New Ideas in Psychology* 56 (2020): 100750.

[922] Stephen Turner, "Weber on Action," *American Sociological Review* 48 (1983): 506-519, see p. 510.

What We Study When We Study Probability

Empirically speaking, probabilistic orders are not dependent on personal level traits, which leads us to make a three-part distinction.[924] Probabilistic orders are the objective *potential* of observable outcomes. We can describe their tendencies and their initial conditions independent of any calculation; we can describe what they are capable of or imagine what their potential is. Not all of it will be rendered actual, or only will with enough time and the order's coherence, but this makes such investigations no less empirical or valid. Their *probabilities* can be measured statistically, at a macroscopic level, though they also assume microscopic form in expectations. As we have argued, probability (and probabilistic orders) only "exists" in action and expectation, as single-case probability, or *Chance*. It does not exist in our models. We can calculate *frequencies* by taking observations over time, "in the long run," dividing pockets of predictability into classes and independent and dependent sources of variation; yet to be explanatory, a frequency must be translatable into the probability of expectation. Adequate causation finds its necessary condition in such a non-arbitrary link, in which the probability of an outcome is already available in what we can expect of initial conditions. Without adequate causation, we can still perform analysis on a pocket of predictability, but it will be without

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[923] See Lorraine Daston, *Rules: A Short History of What We Live By* (Princeton: Princeton University Press, 2022), 273.

[924] Here we align with Mauricio Suárez, *Philosophy of Probability and Statistical Modelling* (Cambridge: Cambridge University Press, 2020) and Rani Lill Anjum and Stephen Mumford, *Causation in Science and The Methods of Scientific Discovery* (Oxford: Oxford University Press, 2018).

action; it will more resemble an artificial theatrical stage, in which individual pieces (humans, atoms) move around in front of us, but with no sense of how, why, or what may come next. The knowledge gained is not sufficiently different from what is achievable from studying Borges' Babylonian lottery.

The basics for probabilistic order, however, are simple by comparison. Every time we make a rule, we create a propensity. By itself, this is usually not enough. Yet backed with legitimacy, or power lent from a legitimate source, this can create a propensity, depending on what the rule says and how it says it. Already we have several criteria here for a propensity: rule, power source, content of rule, source of legitimacy, and the stated performance of the rule. Added together, they have the effect of an objective propensity, a dispositional property as a range of possibility. This is a container of *Chance*, of objective probability as we loop into it with more or less unpredictability. Should, for example, the rule be "thin" and subject to contingencies of interpretation, we will find a wider range and more unpredictability, more outcomes than can be perceived as adequately caused (without, however, observing the intervention of chance mechanisms); it might be "thick," on the other hand, with a narrower range and fewer surprises.[925] The legitimate power might be disputed and subject to constant change. There could, on the other hand, be a clear delineation of who makes the rules and who follows them. According to Weber, objective probability expands with rationalization, and it solidifies into orders supported by claimed expertise. We have quantitatively *more* expectation as a result of the proliferation of centralized rule-making spaces that serve to construct and manage ranges of possibility.

There does not need to be rules at all, however, or anything that tries to delineate in an explicit form what the range of possibility is, for an order to be accessible to us as objective probability. To demonstrate this point, consider the following comparison of two different treatments of *network*: social network and actor-network. In the network analyst Ronald Burt's well-known study, "good ideas" are not the possession of particularly brilliant individuals. These ideas instead indicate the fortuitous occupation of a "structural hole" between network clusters, of someone finding themselves in the advantageous position of "brokerage."[926] Yet the position itself does not directly transmit good ideas to its fortunate occupant by some strange osmosis. The network, rather, serves as an indirect measure for something else: "non-redundant information" (Burt's explanation).

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[925] Daston, *Rules,* 3ff. Computer rules (algorithms) are more the latter, while the Cheshire Cat in *Alice's Adventures in Wonderland* who observed that "We're all mad around here" are more the former. A thin rule opens a range of possibilities wider than a thick rule, as "thinness" invites in the contingencies of interpretation (How do you be or do "mad"? And what if you are not mad? What are the consequences? Is it even a rule?) and does not activate error minimization as fear or self-interest as straightforwardly. It is harder to draw analogies between tests in the context of a thin rule. This is not the same when the rule is thick. Machine-like predictions indicate the presence of thick rules. Not mistakenly, perhaps, the promise of artificial intelligence is to make the thick rules of computing *thinner* by comparison, allowing for the "super-critical" responsiveness that, we might say, is characterized by surprise followed by expectation, or learning. See also, A.M. Turing, "Computing Machinery and Intelligence," *Mind* 236 (1950): 433-460, especially p. 454.

We want to spin this a little differently to make it less deterministic. Brokerage demonstrates that its occupant can be oriented to objective probabilities that are novel enough to those in other network clusters that they can be surprising but not impossible (or appear random); they derive from an orientation to the same range of possibility, just with slightly different established *Chances*. Rather than being a fixed objective entity in the world, then, with no direct connection to action (or only an accidental, container-like connection), networks can be understood as sets of objective probabilities that emerge and cohere in such a way that they can be made distinctive and differentiated by patterns of social interaction. Nodes and edges are references to points of orientation, in other words, and thus of probabilistic expectation that falls within the same *Spielraum* but could bear only a slight family resemblance. Arguably, then, what Burt's study demonstrates is an arrangement of differential *learning* that varies between actors situated in different, emergent pockets of predictability. Not everyone has "good ideas" to everyone else; but for this to be the case, everyone does have to at least be *oriented* to the network as varied probabilities to perceive the novelty.

For networks, this orientation is maintained by social interactions that reoccur, repeat and loop into whatever makes the interaction objectively probable (common workplace, work group, chain of command). In a *purer* sense, however, objective probabilities can be determined moment to moment, and interaction to interaction, with fewer additional constructing factors other than these interactions. This is worth highlighting, because it draws out a key probabilistic mechanism: namely, the *test*. In Burt's example, taking his data from a highly institutionalized organization (a large American electronics company), most tests have been absorbed by other constitutive factors. So what remains available as the dynamic property, capable of creating a new distribution aside from those preestablished on the basis of firm links to certain initial conditions? It can only be whether you are a conduit for new information. Despite the network "Law," to borrow Du Bois terms, there is still this "Chance," which has the novel effect of reorganizing and altering the typical outcomes from initial conditions, improbably advancing careers for instance, creating a new type of capital, even being a mode of merit in a world that seems comprised of fate. Nevertheless, there is still much predictability in the situation, so much so that Burt can make a structural argument. A different "network" order fundamentally departs from this, but only because of the lack of predictability.

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[926] Ronald Burt, "Structural Holes and Good Ideas," *American Journal of Sociology* 110, no. 2 (2004): 349-399.

The primatologist Shirley Strum along with Bruno Latour make the proposal that in baboon societies, each individual "baboon must constantly test and define their relation to other baboons."[927] In human societies, such a constant redefinition is hardly common. What has been made objectively probable, and which occurs with measurable frequency, cannot typically be altered by a single interaction. To the extent that these interactions and connections serve as the basis for objective probability to any considerable degree, a network scientist like Burt can attribute predictive qualities to an analytically defined "structural hole," and sociologists can find network effects of various other kinds based on frequencies. Meanwhile, the typical baboon order is an almost paradigmatic case of probabilities that will largely elude statistical measurement. If we dissect the order test to test, with tests consisting of (to the best of our knowledge) each interaction, analogies can be drawn, a structure can appear, yet the degree of certainty is far less reliable. What we identify as tests will be instances when the order can be remade, which, if not reorganizing the initial conditions for the group, will render negligible whatever was predictable before. The typical human order, by contrast, finds some semblance from test to test, because typically their reorganizing effect is tempered by other factors constituting objective probability such that it will not dramatically change. They unfold within a definable range of possibility, allowing us to say that what we count the frequency of is comparable enough to be instances of the same thing.

Importantly, then, in both cases, a network is present. Interactions and ties repeat within distinguishable patterns and groupings; yet only in one case can we assign the network as an adequate cause. In the one case, the predictable consequence results from the way a network gives order to objective probability, while in the other, it does not. For the baboon in a typical order, each test constructs the reality of possibilities, and while it might be stable, it only has as much duration as the next test—and any interaction (at any time) *could* be a test, pushing the probable boundaries of the order by venturing into the realm of the possible.[928] For the managers in Burt's study, the highly institutionalized setting gives more arrangement to the future. In the electronics company, actors can know what will be asked of them; they can know to a large extent the tests that open the possibility of getting fired or promoted. Typically, this does not include making contacts with those outside of one's immediate work group. Yet once "good ideas" *become* expected, bridging social capital is what *brings* good ideas.[929] The difference between the two cases, then, revolves around a difference in what orders objective probability and whether the way it orders it brings duration and limits range.

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[927] Shirley Strum and Bruno Latour, "Redefining the Social Link: From Baboons to Humans," *Social Science Information* 26, no. 4 (1987): 783-802.

The focus here is on the way that pockets of predictability come into formation (or not). When they do not, statistics can still be employed to measure frequency, but they are non-inferential because the predictability they might reveal finds no analogue as probability-in-action. As we have stressed, probability-in-action is what statistical measurement can tell us about when the range of possibility does allow for analogies to be drawn between past and present cases when the temporality in question is repeating and durational. But that is a question that cannot be answered by statistics.

Statistics are useful given the chance-taming and order-heightening factors that make each test similar, and therefore countable and comparable, with the result being more duration, more repetition and diminished instantaneousness. Strum and Latour refer to chance-taming and reduction as a "succession of simple operations," with computers being the prototypical example.[930] Machines, and especially computers, are capable of an astonishing number of tasks on the basis of a "series of small steps." Those small steps are the key to generating such a broad range of possibility while still allowing for a high degree of *predictability*. This paradoxical combination of small and large, simple and complex, is what marks a typical human order above anything else, at least according to Strum and Latour's network study; whatever we might single out (culture, power, institutions) is at the service of making the combination mutual. Yet, without probabilistic reasoning, we could not adequately explain this.

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[928] "… baboons are not *entering into a stable social structure* but rather negotiating what the structure will be … baboons are constantly testing, trying to see who is allied with whom, who is leading whom … the social link is transformed into a process of acquiring knowledge about 'what society is.'" Strum and Latour, "Redefining the Social Link," 788 (emphasis original).

[929] "… the company, in practice, actually recognized and rewarded brokerage. Managers who often discussed supply-chain issues with managers in other groups were better paid, received more positive job evaluations, and were more likely to be promoted." Burt, "Structural Holes and Good Ideas," 369ff.

[930] Strum and Latour, "Redefining the Social Link," 791.

Qualitatively unique yet still characteristic or typical traits, on this kind of scale, inclusive of many bits of empirical evidence, are what makes sociologists return so often to "structure" or "institution" in their accounts. However, if this is not to be vulnerable to nominalist dismissal, in which a concept is so inclusive that the best we could hope for is to create a description loop, then continuity demands we not empirically bracket prediction as merely *our* analytic knowledge. To arrive at the probabilistic loop at the heart of social orders at any scale, we must make the action that creates and recreates the order *similarly contingent* on a supportive counterpart in the expectations of actors themselves.

Modeling Probability Orders

The promise of probabilistic sociology is to draw attention to the effects of probabilistic orders in social life. As we have suggested, the existence of these orders can be demonstrated and represented by statistics, and theory can lead us to hold expectations of these orders, but they can only really be known through action, because they merely consist of possibility. As we have argued, social action finds a specific analogue with trials and tests, or what consists of a more or less controlled engagement with a probabilistic order in a manner not formally dissimilar from an experimental test. This is a recipe for learning, as what loops back to us takes the form of an expectation, which makes the next test like the first, as we come to form expectations despite our uncertain engagement. With enough trials, we learn objective probabilities and engage again with an "assuredness in decision"—colloquially referred to as "having experience" (experiment, after all, is a derivative of this word).[931] This same model of action as engagement with probability and expectation as learning probability is observable in language acquisition, and likewise, the same idea applies: what we acquire through action we acquire by learning.

We can compare probabilistic orders by modeling their structure of objective probability, what makes their tests comparable, reduces particularities, allows for analogies between tests, and on this basis allows us to calculate probabilities. We can now begin to theorize the role of expectation in social action. How do these orders allow for adequate causation as opposed to chance causation? Why are only certain factors expected to be causes rather than just anything? Not all probabilities we calculate are probabilistic orders. For those that are, adequate causation is applicable, as a way of turning an objective probability into a subjective expectation. Yet we will learn nothing if what we engage with does not consist of *Chance*, as opposed to single, unrelated instants (e.g., "chance mechanisms"), one completely distinguishable from the next, bearing no similarity or connection. We cannot learn when there are no probabilities *to* learn; neither, for that matter, can we measure probability when there are no probabilities to measure. We have described probabilistic orders with a certain, basic symmetry: what statistics learns is not different from what theory or experience learns; none is less objective than the others. Expectations, statistics, a description of initial conditions as propensities or potentials: these are all descriptions of the same thing. The only distinction to be made is how they allow us to learn about *Chance*.

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[931] Edmund Husserl, *Experience and Judgment* (Evanston, IL: Northwestern University Press, 1973/1948), 52-53. See also Martin Jay, *Songs of Experience: Modern American and European Variations on a Universal Theme* (Berkeley: University of California Press, 2005), 10.

There is, however, a comparative method that we should not pass over. Probabilistic orders come in many specific varieties in the social world. They exist at multiple scales in time and space, from capitalism to Argentinian waiting rooms, from the job search in the US to a boxing match, from the roulette table to a marriage. Regardless of how empirically specific or encompassing they are, how much duration and spatial range they have, we can model their constructive principles as they select and retain the same features despite all the particularities that are not repeated between each probability order. Importantly, these are not subjective constructs, though they are interpretively rich from an analytic point of view. They demonstrate loops into different objective probabilities that are structurally analogous. What we describe and model here are different general potentials of the social world.

We refer to these models as *apparatus*, *field,* and *game of chance*. We can initially distinguish between them as different probability structures by how they involve adequate causation, or how, in forbidding chance mechanisms, they allow only certain factors to *be* causal, thus controlling (more or less) the probability of initial conditions and the probability distribution over outcomes. The tension between chance mechanisms and adequate causes is the domain of "luck" in single-case probabilities, which can be nearly indistinguishable from typical events in a game of chance, but are the site of heightened concern and regulation in fields where they can be distinguished by expectations of what *should* matter.[932] To identify luck requires a prior expectation against which it appears as an error in influencing what has been constructed to be an outcome, so it is not just a question of stability in single-case probabilities. In distinguishing luck, we can see how initial conditions are not, by themselves, enough to construct a social order. We maintain expected outcomes, within a range, allowing for only initial conditions to precede those outcomes. We also assign meanings to those outcomes, but we should not expect that interpretations, of this sort, can change them.

For an *apparatus*, probabilities do not emerge from initial conditions in the same way that they do with a game of chance; still, the nearly complete control on chance mechanisms can make even architecture or a camera on a roof an adequate cause because it translates objective probability into subjective expectation. Even if the entire set up is a mirage or a fake, the hold on our expectations is strong and nearly impossible to overcome. Often, an apparatus bypasses consciousness and appeals to the recognition of possibility by other parts of the body instead; thus, our body can betray us. But should we become capable, *our* role as an adequate cause in the apparatus becomes apparent and potentially transformative (or might serve as cruel confirmation for what we suspected all along).

For a *field*, adequate causation takes the form of a distinct kind of invested *striving* after what is a stake in the field: probabilities emerge out of the dynamic of action, even if, with capital in a field, we can predict based on initial conditions. Chance causation is prevented in fields because of tests, or situations of open objective potential, which ultimately close with only a small range of what was possible now rendered actual. While tests can be clearly specified and publicized, this is unnecessary; more often, they are known but not official, and perhaps only made public in complaints about their unfairness. Most notably, all fields feature species of capital that act as a control on the future in these probability orders, which means that capital, regardless of what it specifically is, only exists in relation to a field. And to make a given thing *into* capital requires a testing mechanism that specifies it as an absorber of uncertainty. A field only allows some things to be adequate causes, or some things to determine the results of tests, which leads to the expectation that these (and only these) things will matter for the test. When that does not seem to be the case, the spell is broken, and we perceive injustice. Thus, when probabilities mismatch with our expectations, this challenges our investment in the field as fueled by hope and security of achievement, as defined by the field's record of our action.

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[932] Thus only in probabilistic orders with the characteristics of fields does the following definition of luck apply: "... a lucky event or occurrence as one that involves chance, is consequential (either beneficial or harmful), and is at least partially outside the control of the person or people affected by it." Michael Sauder, "A Sociology of Luck," *Sociological Theory* 38, no 3 (2020): 193-216, quotation is on p. 195. See also Bernard Williams, "Moral Luck," in *Moral Luck: Philosophical Papers, 1973-1980* (Cambridge: Cambridge University Press, 1981), 20-40.

Finally, in a *game of chance*, adequate causes are defined by the rules of the game: probabilities do not seem to emerge from action, but from initial conditions, which makes our subjective expectations quite secure in terms of what we can expect to happen and why. Yet, those expectations have little purchase on objective probabilities in this kind of probabilistic order. Our action does not seem to matter, and our expectations carry little weight in these spaces, which is part of their appeal (because they can seem entirely open and therefore draw enormous hope) but also their limitation (no moral force). Generally, games of chance have tests too, and often it is evident what the tests are. Yet, capital does not control the future here, as there is no history in a game of chance. Strict independence applies from test to test, which are joined only by sharing the same rules. There is no record of our action in a game of chance, only that once, perhaps, we won, regardless of how many times we lost.

Apparatus

The classic theory of apparatus comes from Foucault's analysis of the panopticon, the prison design proposed by Jeremy Bentham in the early 19th century.[933] The specifications were clear: with a guard tower in the middle of a circular structure at a right height and angle that those in the cell surrounding the central tower cannot tell if a guard watches them or not. Because this is unpredictable, the prisoners are left in limbo, and so the risk of being seen is always apparent to them. The surveillance implications of this are clear, but more than this, what an apparatus is, beyond its material design and architecture, is a careful manipulation of probability. This revolves around a singular test, in which everything *could* be a kind preparation or criteria; anything could result in failure. The rules are therefore clear but also ambiguous. The prisoner forms expectations, but as in the case of the panopticon, objective probabilities can only be suspected, never entirely settled or certain.

An apparatus applies when a test is singular, allowing for an actually small range of possibility, and while we can *expect* what it involves—at the very least we can expect our action will matter for the outcome, even if this may only serve to mediate probabilities of initial conditions that can fully predict those of outcomes—we may also never be entirely certain. Unlike a field, an apparatus does not depend on an accumulated history; rather it has the effect of creating one, particularly accumulations of history we associate with social structures and systems of long duration (racial and gender structures, capitalism, for example). While we can learn from the past, only some of it will be relevant for what makes this history parametrically analogous or comparable (able to be "colligated" by analysts).[934] Even an educational test, in which what a test will *test* can be made explicit, will still be marked by uncertainty—not enough to indicate that anything could happen, that any action could mediate any actual outcome, as in a game of chance, but just enough not to be sure. The only way to completely reduce uncertainty in an apparatus which has not been rendered explicitly into a test, is through trial and error, flows of action and reaction, where "the long run" does not add up to a full range or statistical pattern, but rather the history that the underlying test creates and how you relate to it. This consists of finally arriving at a very small (perhaps singular) range of links between initial conditions and outcomes that are anything but chaotic.

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[933] Michel Foucault, *Discipline and Punish: The Birth of the Prison* (New York: Vintage, 1977), 201.

In the case of Bentham's panopticon, an apparatus is found in architecture, but we must be careful not to confuse apparatus with architecture, or with any other specific material arrangement.[935] The focus, rather, is on a distinct kind of probabilistic order and its construction, rooted in an augmentation of objective probability and a subjective looping in. As others have noted, the panoptic effect is observable in surveillance methods that lack many of the aspects and features that we see in the prison arrangement. These different panoptic forms are relatable, however, on the grounds of probabilistic orders, specifically that despite the different arrangements of objects and material parts, they construct objective probability the same way, which means that between the tests, we can draw analogies.

On these grounds, much as what Bentham envisioned in the prison design and which Foucault registered as relations of power, apparatus make it possible to make *predictions*. But we can take this point even further. What Foucault (and others after him) diagnosed as the "investment of power" in the apparatus, and which according to some exemplifies Foucault's fuzzy understanding of what power is (and where it is), does not appear to give power a precise position or to a definite possessor, but instead shrouds it in ambivalence.[936] Probabilism can make sense of this. Given the comparative certainty of the return on acting within an apparatus, we should expect to find the strongest sense of subjectivity here in comparison with a field's probable but essentially unpredictable distribution of chances and the open-ended games of chance. If you can lose your status and identity when the chances turn against you, or when you stand little chance to begin with, firm identities and roles arise from sites with the *least* unpredictability.

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[934] See especially Lyn Spillman, "Causal Reasoning, Historical Logic, and Sociological Explanation," in *Self, Social Structure, and Beliefs: Explorations in the Sociological Thought of Neil J. Smelser*, edited by Jeffrey Alexander, Gary Marx and Christine Williams (Berkeley: University of California Press, 2004), 216-234.

[935] Giorgio Agamben, "What is an Apparatus?" in *What is an Apparatus? and Other Essays* (Stanford: Stanford University Press, 2009), 1-25.

We find power, in Foucault's sense, in the loop between expectation and chance configured when chance is *objectively closed,* so that it can seem like all we orient to are necessities, or things that we can seem to transparently guess causes and effects (equivalent to guessing what would happen if we try to walk through the wall of a prison cell). Like an apparatus-power in whatever specific form, the effect registers as predictability. The loop of expectation and chance can have a conformist or even resigning effect, but it does not have to be entirely deterministic or totalitarian. What it needs is a configuration of probability in such a way that while we *could* act against our expectations in relation to these chances, we must overcome our certainty about those chances.[937] The tendency is to act in surprising conformity with what, from an outside perspective, might be observable as a house of cards. What we are *completely* sure about can make us a prisoner of our expectations. Only in exceptional cases can we act against them, in which we might see that the entire arrangement was a mirage to begin with. Though we could only witness that after having taken a great risk and acted contrary to what the apparatus leads us to expect.

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[936] This is the argument of Judith Butler who, drawing on sources like Foucault's Panopticon, Hegel's "master-slave dialectic" and Nietzsche's genealogy of morality, arrives at the paradoxical conclusion that the more power operates as a predictable, "dependable" source, the stronger the sense of subjectivity we should expect to find in relation to it. The imagery here evokes a loop: "The form this power takes is relentlessly marked by a *figure of turning*, a turning back upon oneself or even a turning *on* oneself … [T]he turn appears to function as a tropological inauguration of the subject, a founding moment … ." Butler, *The Psychic Life of Power,* 3-4 (emphasis added).

[937] Foucault (*Discipline and Punish*, 201, emphasis added) adds the following insight about the Panopticon: "So to arrange things that the surveillance is permanent in its effects, even if it is discontinuous in its action; that the perfection of power should tend to render its actual exercise unnecessary; that this architectural apparatus should be a machine for creating and sustaining a power relation independent of the person who exercises it; in short, that the inmates should be caught up in a power situation of which they are themselves the bearers. To achieve this, it is at once *too much and too little* that the prisoner should be constantly observed by an inspector: too little, for what matters is that he knows himself to be observed; too much, because he has no need in fact of being so. In view of this, Bentham laid down the principle that power should be visible and unverifiable. Visible: the inmate will constantly have before his eyes the tall outline of the central tower from which he is spied upon. Unverifiable: the inmate must never know whether he is being looked at at any one moment; but he must be sure that he may always be so … [in] order to make *the presence or absence of the inspector unverifiable* …"

From test to test, differences would arise if there were no apparatus (or any probabilistic order for that matter). Instead of difference, then, we observe analogies and repetitions that link test to test and make them comparable. This range of possibility allows for the measurement and calculation of predictability, which Foucault registers in his distinctive theory of power.[938] We can speak generally about apparatus; it becomes a "general concept" because of its probabilistic properties. Like all probabilistic structures, apparatus have duration through their persistence between tests. They forbid differences from appearing, which in this case is what remains particular and therefore unpredictable. For those who engage with the orders so arranged, the same results can be observed should they "test" them repeatedly, which means that we can predict the outcomes of those tests. We can predict, in other words, what will happen should we put a prisoner into a panopticon, which exerts power by making that prisoner predictable. Should they expect that a guard is not in the guard tower, they might test this probabilistic order—and it just might work on this *particular* occasion. A guard might *not* be in the tower and the prisoner might escape. But this is exceptional. Generally, the prisoner does not have that expectation. We do not find a guard absent from the tower.[939]

Fields

In a field, objective chances are more open than in an apparatus, and this is for the main reason that rules remain relatively thin by comparison. A given actor can expect to change the rules, for instance, which leaves fields more fluid and dynamic than apparatus, allowing relatively more space for difference to appear and for the general order that is the field to lend itself to particular applications, new trials, thus adapting it to a range of projects beyond the project for which, generally speaking, it finds its most probable application. A field, unlike an apparatus but like a game of chance, must provide a space for hope and opportunity, which in probabilistic terms means a space for difference and unpredictability relative to other social spaces. What is predictable and general (repetitive) outside the field can become unpredictable (difference-making) in a field. Participation in a field can change a particular life that might have otherwise been destined toward a given fate.

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[938] Michel Foucault, "Governmentality," *Ideology & Consciousness* 6 (1979): 5-21.

[939] Consider, for instance, the rigidly-policed gender distinctions and firmly bounded sense of possibilities among the working-class youth that Paul Willis studied. In a similar sense, the "lads" lived in a fully enclosed world when they could fully expect everything; there were no surprises in store, and thus nothing to hope for or, by contrast, to ever fear losing. Thus, when surprises (factory closures, broken relationships, school success) did happen, the shock waves assumed various emotional, social and political forms. Paul Willis, *Learning to Labor: How Working Class Kids Get Working Class Jobs* (Aldershot, UK: Ashgate, 1977). See also Simon Charlesworth, *A Phenomenology of Working-Class Experience* (Cambridge: University of Cambridge Press, 1999).

But this should not imply that fields constitute an entirely open type of social space. They are burdened by history, and while fields can be appropriated for different projects, history constricts the range of possibility.[940] Some things are, strictly speaking, *impossible* in fields. Fields are the sites of striving, or modes of trying in which the stakes involved are potentially transformative, in which we can expect something equivalent to winning or losing, because the consequences are less unclear than in both games of chance and apparatus. History provides a degree of certainty in fields, of how players might be transformed by the modes of trying that mark the field: more specifically what they stand to lose or gain. They cannot gain just anything; *everything* cannot be rendered different by a field as it can in a game of chance. From test to test there is not a strict independence held together only by rules. In a field, actors are bound by their histories, and while nothing in the fields' range of possibility is not open to them, they are bound by its objective probabilities, or what they can expect *will* happen if they pursue some of these possibilities rather than others.

Thus, fields are subject to a different power dynamic than apparatus. *Capital* appears only in conjunction with fields as a distinctive means with which to eliminate difference and with it unpredictability, and to control the future within the space of a given game. Capital has the effect of homogeneity. Those who have it are subject to less risk in their striving because capital reduces the chance that circumstances will disrupt and interfere with that striving. Thus, capital acts as a *control on the future* in a social space where, objectively, the future remains improbable and indefinite, though capital skews this by making the future *less* improbable for some. There is nothing comparable to this in an apparatus or a game of chance in which outcomes are fixed.

Capital arises in history, through an accumulation of what can serve as a control on the future under the right circumstances, which we can understand probabilistically as circumstances that allow for difference, that are not strictly reproductive and repetitive, or highly predictable. Capital does not encourage a static context, even though it acts as a control on the future. Rather, the maintenance or accumulation of capital becomes the focus of action in a field, which could mean changing what counts as capital, but typically means changing the mode of trying or striving that is capable of accumulating capital. Not all fields are equally shaped by capital, which means they have less history. There is *more* independence between tests, and regardless of what we might suspect to be capital, it does not make the space predictable in a way that we can calculate, at least until it settles again.

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[940] Pierre Bourdieu, *The Rules of Art,* 309ff. As alluded to in chapter 8 above, a probabilist approach to fields deviates from a more schematic (or architectonic) reading of the same. The difference rests in the more gradualist and fluid association with existence of fields for a probabilist, which extends from the basic point that fields are merely objective probabilities in action. A field depends on the *chance* that action can be oriented by it as a range of possibility. Anything structural about fields is our analytic model of this basic process, but fields themselves are not structures. See Philip Gorski, "Bourdieusian Theory and Historical Analysis: Maps, Mechanisms, and Methods," in *Bourdieu and Historical Analysis,* edited by Philip Gorski (Durham, NC: Duke University Press, 2014), 327-367.

In a field, objective probabilities feature more chance (or difference) than in an apparatus, but less than in a game of chance. But within fields, this is a source of variability, and it varies with the presence of capital. Because capital decides the stakes in a field, probabilistic expectations can be remarkably homogeneous even without evident learning mechanisms like proximate observation or explicit teaching. We can explain expectations within an apparatus due to its configuration, which allows for so little variability. The same is not true for fields, which appear more open and unpredictable by comparison, allowing for more difference and particularity. Yet, capital, as a way of controlling the future, can extend a kind of "criss-crossing censorship" that becomes observable in fields and demonstrates a different mechanism for this uniformity, as it rests on an orientation to capital and the durable expectations that capital, as a control on the future, creates.[941] This is also why we can speak of fields in general terms, with coherence and predictability, even though what makes a specific field is (unlike a game of chance) not as strictly definable by whatever formal rules might be present, and there may not be any of these rules.

Thus, fields are sources of expectations that remain less reliable than those formed by apparatus, but more reliable than a game of chance. We can calculate objective probabilities in fields, as the tests repeat and modes of striving remain comparable, with it being possible to anticipate what will be effective from test to test and what the consequences of the tests will be. This also means that actors can themselves anticipate and make judgments akin to finding possibilities not open to all but either for or *not* for "the likes of us." There is a more discriminating and segmented way of looping into possibilities, making classes apparent in a distribution of chances. With apparatus, classes are peripheral: a division between guards and prisoners, for example, about whom uncertainty is reduced to such an extent that action does not appear as trial or test when all seems predetermined. Actors fade into the background of the arrangement when the control of probability makes them interchangeable. In fields this can be true, but only to an extent, as objective probability cannot be *entirely* controlled, regardless of the material objects and arrangements that might be part of the field. It is possible, however, particularly as Foucault's account suggests, for a material arrangement (e.g., architecture), by itself, to *create* an apparatus.

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[941] Pierre Bourdieu, "The Peculiar History of Scientific Reason," *Sociological Forum* 6, no. 1 (1994): 3-26.

Because of capital, fields create classes, as the distribution of chances remains persistent between tests with uniform and predictable outcomes. Looping into a field creates classes because of subjective expectations that mirror these probabilities, and how they are shaped by capital. With classes, fields are *not* sites of equal opportunity.[942] Possession or dispossession via capital has the effect of creating advantages and disadvantages, both of which become apparent (or contextual) in field-specific tests, where in principle all chances are equal and open, and the distribution of chances have a predictable, recurrent, and repeating quality. In all cases, the relative degree of uncertainty also introduces time, and like Du Bois and Bourdieu, this would recommend that sociologists drop the "mechanics of the model," which could work only in reference to a state of absolute certainty and treat models as indicators of processes characterized by rhythm, orientation, irreversibility and the concrete fact that relative unpredictability is integral to all social action.

Games of chance

Rules alone hold games of chance together and allow us to speak about them in general terms. If we refer to roulette, poker, or blackjack, we refer to collections of rules that dictate a range of possibility; but beyond those rules, at least in principle, nothing else matters for the patterns that we observe or the distributions that become actual—not even our own action. Most fundamentally, this means a strict independence between tests, which are clearly marked out engagements with chance in which, each time, *everything is equally probable* that is allowable by the rules of the game.

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[942] That a probabilistic order with the structural architecture of a field is simultaneously a moral order is suggested by the philosopher Maurice Merleau-Ponty as follows: "Unless there are cycles of behavior, open situations requiring a certain completion and capable of constituting a background to either a confirmatory or transformitory decision, we never experience freedom … If *freedom* is to have room in which to move, if it is to be desirable as freedom, there must be something to hold it away from its objectives; it must have a *field*, which means that there must be for it special possibilities or realities which tend to cling to being." *Phenomenology of Perception* (New York: Routledge, 2012/1945), 549 (emphasis added).

Thus, in quite the opposite sense from apparatus, games of chance demonstrate the most open-ended structure and distribution of chances, about which the *least* reliable predictions can be made. This holds even though the range of outcomes can be known from the initial conditions (which includes the rules), though knowing these as possibilities does not lead us to expect as more or less probable in each single case. This means, in turn, that games of chance can fuel the highest hopes; by eliminating a link from test to test other than by rules, games of chance eliminate history, and forbid the past from controlling the present.[943] Everything can be transformed in an instant, though even if this is possible in principle, it is also unreliable.

Nothing can prepare an actor to increase their chances of success in a game of chance; they forbid all forms of capital. There is, therefore, no mechanism for the genesis of classes or groups: all individuals confront the rules equally and try their luck. Nothing, meanwhile, can create the kind of predetermination that characterizes an apparatus, and which would otherwise have the effect of forbidding all hope. There is therefore an equality of opportunity in games of chance; but if equality of opportunity applies formally to them, which indicates mostly how initial conditions relate to outcomes, games of chance also forbid the fairness of justice, outside of the application of the rules. In a game of chance, we cannot expect that anything *should* happen next. We cannot deserve anything or be owed anything, aside from being equally subject to the rules, which makes us all the same players of the game, with nothing particular about us. Unfairness and injustice appear from games of chance by allowing particularities to be "singled-out" by the game, making one player's experience different from others, making it seem like something outside the rules is adequate to create certain outcomes when nothing should be. Even in games of chance that are not actually designed as games of chance, for the purposes of gambling, this same rule holds.[944]

Thus, while recognition is possible in a field, as it is possible to be the embodiment of capital and therefore "justified in existing" (though only because of the absence of arbitrariness), in a game of chance, the opposite is the case, as randomness makes a similar durability impossible. This also makes the kind of firm sense of subjectivity, akin to identity, within an apparatus impossible when a probabilistic order more resembles a game of chance. If we do not have a sense of subjectivity in a game of chance, this is largely because our action seems to make no difference. We flip the coin or roll the dice. Events unfold that, outside of occurring within a set of rules, could otherwise appear unrelated each time we or anyone else does it. There is no apparent repetition, and so even while we initiate the events, they have no predictable link to our action.

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[943] "[Action] is found when a series can be created by consecutive winning turns, such that each further turn adds the same additional probability of terminating the series while adding more than the previous turn's value to the series as a whole." Erving Goffman, "Where the Action Is," 205.

[944] Bourdieu's early research among peasants in Algeria, whose world had been displaced by "colonial structures," exemplifies a condition where, for this group, such a rapid and ruthless change of objective chance meant that expectations appeared entirely "hysteretical" in the loop. Thus, while a peasant might be unemployed in an objective sense, they did not believe themselves to be unemployed because that would presuppose a connection of cause and effect, which is impossible to distinguish in a game of chance. Like gambling, this condition also fueled grand ambitions (though with no plan forward) and deep despair (without being able to specify why). See Pierre Bourdieu, "The Disenchantment of the World" in *Algeria 1960* (Cambridge: Cambridge University Press, 1972/1963), 56-57.

Nevertheless, games of chance are not chaotic: initial conditions do link to outcomes rather than being unpredictable. But this is only because of the rules of the game, that exercise a control here unlike rules in fields or apparatus. For a game of chance, rules make them identifiable as including the same events, and giving games duration, making it possible to expect anything (e.g., this is poker and that is Go Fish). It is usually not possible to change those rules, as even the smallest augmentation will create a new game.[945] Like any game, this also means that rules disambiguate the results of tests, or plays, by making them clear and, like the tests of fields, prevent interference with the results. The clarity of rules prevents a questioning of results, like why they happened and were they fair. This also means that the results can be recorded and written down: there is a listing of what happened, even if this should not allow for any predictability upon analysis. If it is clear *how* one can win, it can also be clear what one stands to win (and lose). If this is the case, we are no longer engaging with a game of chance, as we begin to assess our odds. In a game of chance, by contrast, the stakes are clear, and we know what the outcomes could be even if we can't predict how to reach them. An actor can expect what will happen should they "win" the test, but they have no expectation about how to get there other than what the rules tell them are allowable actions.[946] The same combination of certainty and uncertainty observable here is not typical of fields or apparatus. While we expect certain things will happen depending on how we fare on a field-specific test, we cannot be *entirely* certain and there is ample room for surprise. In an apparatus, we can know exactly what to expect, and we do not expect to be surprised; though we might be entirely in the dark about how large or small our range of possibility actually is.

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[945] See C. Thi Nguyen, *Games: Agency as Art* (New York: Oxford University Press, 2020), 65ff; Benjamin DiCicco-Bloom and David Gibson, "More than a Game: Sociological Theory from the Theories of Games," *Sociological Theory* 28, no. 3 (2010): 247-271. The same cannot be said of changing the rules of baseball, football or basketball: they will remain (and have remained) the same games even with rule changes, though some outcomes become more objectively probable.

[946] Goffman, "Where the Action Is," 203.

Because of these characteristics, certain kinds of actors might be more inclined to play games of chance than others, just as we might expect that certain kinds of actors might be inclined toward fields, and more specifically toward fields marked by certain kinds of probability, where we can reasonably expect certain things. A game of chance is *potentially* transformative, even if it cannot be fair.[947] In a single instant, everything can be different. A game of chance not only does not take history into account, in this regard, it can even *erase* history, if by this we mean past conditions that accumulate and limit what is possible for actors in the present. Still, this transformative potential is tempered by the fact that there can be no certainty about a game of chance, at least as it stands without manipulation; one cannot play it to add certainty to the future. Simply put, we cannot *count* on games of chance, though to an extent unlike any other probabilistic order, they can change fates more durably established within other types of probability structures.

Thus, it seems a reasonable hypothesis to make that those who seek to change everything (or who perhaps seek change for its own sake) gravitate toward games of chance.[948] Other routes for making their lives different are closed to them, while this one will always remain open. Those who play games of chance do not seek justice in the world, as justice corresponds with fields and tests, focused on the distributions that these tests create, exactly *what* they test and whether it should have worth. Neither are they seeking rights. An apparatus encourages a morality focused on rights, based on its strict arrangement of probability and whether what it determines takes away what *should* be guaranteed without any uncertainty. Games of chance might be attractive to those who wish to avoid morality entirely, as beyond the minimal expectation of fair treatment under the rules no one can expect anything further. Should one player roll the dice a thousand times and lose every time, while another rolls once and wins, this cannot be unjust or a violation of rights, according to what we can reasonably expect of a probabilistic order structured as a game of chance.

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[947] Nguyen, *Games: Agency as Art,* 89.

[948] Jens Beckert and Mark Lutter, "Why the Poor Play the Lottery: Sociological Approaches to Explaining Class-Based Lottery Play," *Sociology* 47, no. 6 (2013): 1152-1170.

Typological Comparisons and Typical Trends

The analysis here is not meant to be comprehensive or exhaustive. In true Weberian style, it serves as a typology, ideal types arrayed for comparative purposes based on analytic distinctions. Yet, as we have argued, there is more to ideal types than is conventionally assumed; more than strictly analytic constructs, they attempt to loop into typical expectations found among actors in whatever they serve to describe or model. The case is no different here: if you are engaging with, or in other words acting and reacting in relation to, a probabilistic order that more closely mimics the features of an apparatus, a field or a game of chance, its traits are what you can (and will) expect; they will shape the expectations you have. A given actor might loop into these orders via an interpretation or description loop, in the sense mentioned earlier, but ultimately their involvement is contingent upon a probability loop. It is as objective probabilities, or *Spielraum*, that these orders exist and are reflected in subjective expectation.

The discussion thus suggests a certain symmetry between these orders, that they can replace each other in specific cases; more generally that it is possible to loop into one probabilistic order as if it were more like another, to play the game of a field as if it were a game of chance. A given actor can describe or interpret their engagement on different terms than apply in a probability loop. Yet the premise here is that, particularly in a subpersonal sense, the kind of engagement we make and the action we pursue will tend to reflect the characteristics typical to each order, as these indicate what a given type of probabilistic order, whatever it might specifically involve, needs to be probabilistically coherent. Anything else will serve as a chance mechanism, at least in a relative sense, by introducing chance ("inviting it in") as opposed to encouraging an orientation to an order's distinctive *Chance* ("taming it"). We only need to imagine how quickly an actor would likely be forced out of a field if they did not recognize what its history makes possible and its capital makes probable, and instead gambled anew in every action, as if they were playing a game of chance; or if they played a game of chance as if they were in a field, expecting that the history of their play would somehow matter for the present roll of the dice, as if they deserved to win.

If the discussion implies the relative prominence of fields over games of chance and apparatus, this is because in a normative sense if not numerical there is validity to that statement. The tendency toward bureaucratization, as Weber documented, serves to replace destructive *fortuna* with socially constructive *Chance*. As a probabilistic sociological claim this would involve a shift in prevailing probabilistic order: the relative displacement of games of chance and apparatus by fields in giving an overall shape to social space, if not numerically than certainly normatively. This allows social justice to obtain a principal significance, as reflected in expectations of what should apply to both initial conditions and outcomes in each test, thus indicating an orientation to fields as the type of probabilistic order that *should* displace others less like them. Games of chance are not forbidden in this scenario but are comparatively marginal; the morality we can draw from them is not popularly acceptable outside of a narrow range. Apparatus is, in most cases, considered entirely antithetical, and dismantling or abolishing them becomes the explicit focus of social movements and political projects; not, however, to be replaced by nothing (or be replaced by *fortuna* in the ancient sense) but by a field to configure the probabilities they once did.

The Objectively Probable State

Yet, in this kind of contest, there is one factor more consequential than all others, and which can exercise the most influence over the probabilistic orders that populate a given society. This is the *state*, which in a probabilistic sense is defined as the primary (though far from the only) source of the predictability of social life. This is largely because the state consists, fundamentally, of control over the most effective means of creating and maintaining orientations to *Chance*: law-making, legal sanction, the potential of destitution, and most prominent of all, legitimate violence. If, for example, what is probable about a new intimate partner relationship is open and filled with surprise, with innuendo marked by partial signs and unpredictability, it gains objective probability should state-based legal recognition occur, like officially designating the relationship a "marriage." We can make projects into the future because of this (vertical) sanction. The same is true for a labor contract, particularly as opposed to a casual, non-contractual arrangement, like day labor (or gig work). Only the former can configure the order of succession that marks a career or give it the relatively secure expectations that can serve as grounds to protest their violation, something that those who write the contracts can themselves predict.

As Weber points out, laws are a, and likely *the,* major source of social predictability.[949] Such legal recognition therefore contains an important lesson: "the state" refers to the objective probability that social action of widely varied kinds, from economic, scientific, domestic, and even intimate, located within a given territory, is predicated upon. Described this way, “the state” conveys something more than an “idea”[950] but also less than a “cage.”[951] If “the state effect” assumes cage-like characteristics or takes the form of an idea, these describe specific orientations, with attendant expectations, to the objective probability that *is* the state and what it means for social action. Probabilistic sociology emphasizes that such orientations are not “subjective” if by this we mean chosen or decided by the actor who has them. For Weber, orientations to the state do not have to be identical among all actors all the time for the state to maintain its coherence and integrity.[952] Some actors might be oriented toward the state according to “subjective meaning,” while others are oriented to law, convention, or the tools of the state’s claim on legitimate violence (like police and other carceral agents). The same actor can shift between these orientations many times during the same day. Regardless of how actors are oriented to the state, their action remains predicated upon certain expectations they act to fulfill as they fulfill other, more specific expectations.

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[949] Weber, *Economy and Society: A New Translation*, 223.

When we try to define “the state,” then, we do not need to associate it with fixed properties, because they are merely the predictive qualities that we (the analysts) associate with the state, leading to suspicions that it might exist in name only. Sociologists can investigate the state as the most general objective probability toward which those in a given territory are oriented, with the potential to reconfigure all other pockets of predictability found in that territory. There are many probabilities to which actors *can* be oriented when the state is present, but to act in ways that maintain those probabilities, by reducing or accommodating the errors that would otherwise disintegrate them, cannot be performed in a completely autonomous manner. In most cases, this action must *simultaneously* reduce the error that maintains the integrity of the (present) state.

The expectations that arise in conjunction with probabilistic orders, particularly fields, are accompanied by morality, as it becomes clear that the distributions created by tests are asymmetrical or bimodal. Even finding a basic correlation between an outcome of interest and a variable can indicate the absence of egalitarianism. Thus, there can be an “egalitarian bias” in sociology that is not observable in a probabilistic analysis in physics. A strict independence of variables could be evidence of egalitarianism; in the same breath, to find regularity or the lack thereof when the "social truth" of expectations conveys the opposite, will not be received convincingly.

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[950] Timothy Mitchell, “Society, Economy and the State Effect,” in *State/Culture: State-Formation After the Cultural Turn*, edited by George Steinmetz (Ithaca, NY: Cornell University Press, 1999), 76-97.

[951] Michael Mann, *The Sources of Social Power, Volume 1: A History of Power from the Beginning to AD 1760* (Cambridge: Cambridge University Press, 1986).

[952] Weber, *Economy and Society: A New Translation*, 89.

The state ultimately dictates the distribution of fields, apparatus, and games of chance, as it stands as final arbiter and certifier of the factors that create probabilistic orders. The state itself can be modeled as a field, when it serves as the means for certifying probabilistic orders and for handling the disputes of justice that emerge from them. A state can be an apparatus, in which case it still serves as the judge of judges, though its judgmental outcomes are not themselves the product of tests and the possession of capital but rather more like the decisionism of *Kadi*-justice, the singular pronouncement of an powerful Leviathan as the only non-arbitrary figure in the world.[953] When chance mechanisms appear in spaces that should not have them, the ultimate arbiter sanctioning their elimination, within a given territory, is the state.

The sheer presence of rules and laws imposes a continuous, immanent temporality by defining what *should* be probable. Social structures and social identities signal probabilistic distributions that are consistent enough to enable stable guessing, allowing anticipations that maintain the integrity of these formations. Given the brain's incessant prediction, when the probabilistic states we encounter consist of such a landscape, expectations will tend to match objective chances spontaneously. Social action will be "regular" and "ordered" as actors perceive less, and sociologists will be able to speak of tendencies, find correlations, warn of troubling patterns, and even make predictions. To the extent that the world can be predicted, then, it will be experienced in its full continuity.

Probabilism attempts, then, to refocus sociology and social knowledge on *the study of objective probability.* Lessons about the nature of social groups as continuous probability distributions over anticipated classifications and appropriations of cultural and social goods at any one point in time can be extended, without loss, to a continuist way of conceptualizing the main groups, fields, and ecologies more generally as they continuously reproduce themselves *through* time. But this is also tied to the orientations that actors can have at a given time, and how this itself is distributed. Probabilistic sociology maintains that a probabilistic statistical correlation in the aggregate is produced by social action that is no less probabilistic. Quantitative measures attach an explicated meaning to a probabilistic order without telling us much about the conditions that decide what those probabilities are, how actors make predictions and form expectations according to them, how those actors orient themselves to probability, and how this is maintained in social action. This is the most general question, and perplexity, of probabilistic sociology because it integrates an entirely different approach to probability, and with it prediction, into the heart of social knowledge. Sociologists do not have to be limited in their understanding of probability or be saddled with the assumption that any engagement with it that is not statistical or data-driven is not empirically valid.

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[953] See Pierre Bourdieu, *Principles of Vision: General Sociology, Volume 4: Lectures at the Collège de France, 1984-85*, edited by Patrick Champagne and Julien Duval, translated by Peter Collier (London: Polity, 2022/1984-85), 178ff. "Kadi-justice" is a reference to Max Weber's use of the phrase to refer to "informal judgments rendered in terms of concrete ethical and other practical valuations … *Kadi*-justice knows no rational 'rules of decision.'" The prototypical example, in Weber's view is "'Solomonian' judgment as it was practiced by the hero of that legend—and by Sancho Panza when he happened to be governor." In all cases, *Kadi*-justice is contrasted with "rational" justice, as the product of social distance and expert interpretation and "empirical" justice, as associated with tradition. Elsewhere, Weber mentions that *Kadi*-justice ensures the "predictability of decisions .. is at a minimum." See Max Weber, *Economy and Society, Volume 2* (Berkeley: University of California Press, 1978), 1001, 954; see also Pierre Bourdieu, *Forms of Capital: General Sociology, Volume 3: Lectures at the Collège de France, 1983-84,* edited by Patrick Champagne and Julien Duval, translated by Peter Collier (London: Polity, 2021/1983-84), 210.

Epilogue - Theory versus Machines

> *All attachments are optimistic. When we talk about an object of desire, we are really talking about a cluster of promises we want someone or something to make to us and make possible for us. This cluster of promises could seem embedded in a person, a thing, an institution, a text, a norm, a bunch of cells, smells, a good idea—whatever. To phrase "the object of desire" as a cluster of promises is to allow us to encounter what's incoherent or enigmatic in our attachments, not as confirmation of our irrationality but as an explanation of our* endurance in the object … *Being drawn to return to the scene where the object hovers in its potentialities is the operation of optimism.*
>
> ~ Lauren Berlant, *Cruel Optimism*

We can learn a lot by studying a promise. To be *oriented* is not unlike being the subject of a promise. As with a promise, we feel like something *ought* to happen, that there is potential in store for the future. Our forward momentum, our investment, comes not from being oriented toward what is certain to come next, but by what *probably* will—kind of like a promise, giving a sense for what *should* happen, what *could* happen, a "hovering potential" with no guarantees. To be oriented is to have an expectation, and the capacity to *expect* so resembles the capacity to make and receive promises that Nietzsche wondered if there are any real differences.[954] Because we can make and receive promises we can also shape and have expectations. To have expectations does not suggest an *ex nihilo* source we can never know, but instead a way they world has been configured, and perhaps we have configured it, around things now objectively probable in the world, which we can loop into and take onboard on our own terms, as a hope, a fear, a project for the future. A promise is an intervention into the world of chance that makes a difference, creating and constructing durable probabilities that might never come to be, which in the strictest sense might not even be real, but which maintain a fixed gaze nonetheless.

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[954] "To breed an animal with the prerogative to promise – is that not precisely the paradoxical task which nature has set herself with regard to humankind? is it not the real problem *of* humankind?" Friedrich Nietzsche, *On the Genealogy of Morality,* translated by Carol Diethe (Cambridge: Cambridge University Press, 2006/1887), 35. Nietzsche poses promise-making against forgetfulness, or what "shuts the doors and windows of consciousness for a while." To explain the distinction further, he introduces concepts that echo a probabilistic style of reasoning worth quoting *en extenso*: "… a world of strange new things, circumstances and even acts of will may be placed quite safely in between the original 'I will', 'I shall do' and the actual discharge of the will, its *act,* without breaking this long chain of the will. But what a lot of preconditions there are for this! In order to have that degree of control over the future, man must first have learnt to distinguish between what happens by accident and what by design, to think causally, to view the future as the present and anticipate it, to grasp with certainty what is end and what is means, in all, to be able to calculate, compute – and before he can do this, man himself will really have to become *reliable*, *regular*, *necessary*, even in his own self-image, so that he, as someone making a promise is, is answerable for his own *future*!" Ibid, 36 (emphasis original).

Presumably a promise can remain just that—a *promise*, promissory—a potential never realized, a bubbling thought that never comes to form perhaps, or a dream deferred. Nietzsche fails to mention the optimism that must accompany such an orientation. As we loop into the world, we can do so under the auspices of hope, no matter how despairing a situation might otherwise be, driven forward by expected (error-free) states, driven by a form of "intuitive faith."[955] This hope (and potential tragedy) becomes clear via predictive processing, the vanguard of probabilistic reasoning today, which suggests how the separation of probability and interpretation makes the disenchanting effects of scientific rationality only that much more consequential. We cannot understand our capacity to make promises nor our optimism or our faith in constructed orders without drawing in error minimization, or if we try to do this then we overlook what we must imply should we offer these arguments as interpretive attempts to grasp our action (and ultimately, our humanity). They are that, but to be that they must give us expectations, and like anything else that gives us expectations, interpretations must themselves loop into the world of chance.

These points assume a heightened significance in the present, as the looping effect we observe via machine interfaces can only be comprehended in probabilistic terms. For us, the language of optimism, faith, and promises is important, but the referents for these words must admit something that works below the level of consciousness that does not have to leave us in a suspicious, reductive, or disenchanting mood. Pascal would remind us that we are *already* in a game or games, and we only move forward on the strength of our optimism. We embody better states of being. Even if those states may never occur, even if the odds are stacked against us—regardless, we remain oriented to them. Yet, demonstrably, the process can be manipulated. As Weber understood, loops are sites of power and domination. It is because of our cognitive susceptibility to loops, evidenced by the inevitability of having expectations, that the technical capacities of information storage, retrieval and "modulation" become consequential.[956] Machine learning can create optimism; algorithms can make promises. They operate as a control on both expectation and chance, keeping us within a loop, and thus reliable, regular, necessary—in a word, *predictable*, but as part of machines, which for a probabilist is incommensurate with being a subject, or having a subjectivity, at least as this word is typically defined.

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[955] Dustin S. Stoltz and Omar Lizardo. "Deliberate Trust and Intuitive Faith: A Dual-Process Model of Reliance." *Journal for the Theory of Social Behaviour* 48, no. 2 (2018): 230-250.

On Theory

The origination of theory, as Jurgen Habermas tells the story in 1965, involves a way of likening the body and soul to the "ordered motion of the cosmos."[957] It thereby entered into the "conduct of life." Habermas recounts the break with this traditional view of theory in the occurrence of critique and crisis: the articulation of critical theory by those like Max Horkheimer and the concern addressed about science by those like Husserl in the forbidding 1930s.[958] For Husserl, science could provide no answers to the questions that, because they have gone *unanswered* as a result of science's triumph, will only contribute to the emerging horrors. In its pursuit of theory, science has rendered itself from the "problems of life." For Horkheimer, theory in this "traditional" mold was bankrupt because it had turned its back on theory's calling, rightly conceived: to provide an enriched account of the world and look past the facts constructed by empirical methods into what their possibilities are—what they *could* make possible, indeed, what they *will* make possible.

At the time, Habermas sought a redemption of theory, and he pursued a course (in part, based on his reading of pragmatism) that would attempt to reground it in the fulfillment of interests: technical control, meaning, and emancipation. While many tools could be used with appeal to these interests, theory itself makes a unique contribution, in Habermas' view, particularly to the grandest human interest of them all: liberation from an otherwise fated existence, arbitrarily defined and determined.

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[956] For a discussion of "modulation" as a looping effect, see Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (1992): 3-7; Gilles Deleuze and Felix Guattari, *A Thousand Plateaus*, translated by Brian Massumi (Minneapolis: University of Minnesota Press, 1987/1980), 456-473.

[957] Jurgen Habermas, *Knowledge and Human Interests,* translated by Jeremy Shapiro (Boston: Beacon Press, 1968/1971), 302.

[958] Max Horkheimer, "Traditional and Critical Theory," in *Critical Theory: Selected Essays*, translated by Matthew O'Connell(New York: Continuum, 1972/1937), 188-244. Edmund Husserl, *The Crisis of the European Sciences and Transcendental Philosophy,* translated by David Carr (Evanston, IL: Northwestern University Press, 1970/1936).

When the philosopher Friedrich Schelling gave his famous lectures in 1802 during the summer semester at Jena, it was full of confidence that he could state "only Ideas can lend point and ethical significance to action."[959] These were bold words at the time. They justified and invited the manufacture of "Ideas" (capitalized) with at least the presumption that whatever consequences came (political change, religious skepticism, moral upheaval) did not matter. All institutions were to present the Idea that informed them, or else. Perhaps boldest of all, Schelling's ambitions would justify the existence of universities, at the time widely perceived to be antiquated and medieval, useless and corrupt to the core, as the institutional home of a prototypical modern activity: professional *philosophizing*.[960] For Schelling, theory itself was of a minor status, because philosophy stood entirely "unconditional" (for its own sake). It was therefore only through philosophy that "whole" or the "absolute" could possibly appear at all. Schelling also praises "pure science" for similar reasons, insofar as it finds little obligation to meet things where they are or remain consistent with the maxims of action; it, too, could find a pristine space.[961] Theory, by contrast to both philosophy and science, is of limited possibility, as it can only teach us practical lessons. In Schelling's view, theory differs from experience only in being able to describe it "apart from accidental conditions."[962]

Habermas' effort at redemption finds its lineage here. Theory is disregarded by Schelling for its worldly interests, and Habermas simply turns the tables. But something different is at stake here. For his part, Weber describes the appearance of the "concept" in Ancient Greece as heralding a similar revolution: "here, for the first time, there seemed to be an instrument with which you could grip someone in a logical vice so that he could not escape without admitting either that he knew nothing, or that this and nothing else was the truth, the *eternal* truth that was unperishable…" On these grounds, it "seemed to follow that if you could just find the right concept of beauty, goodness, perhaps of courage, or of the soul … then you could also grasp its true essence; and that, in its turn, seemed to show the way toward knowing and teaching how to act rightly in life."[963] In their Platonic definition, concepts did lead to power, as famously portrayed in the "Allegory of the Cave."

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[959] Friedrich Schelling, *On University Studies,* translated by E. S. Morgan, edited by Norbert Guterman (Athens, Ohio: Ohio University Press, 1966), 72.

[960] See Terry Pinkard, *German Philosophy, 1760-1860: The Legacy of Idealism* (Cambridge: Cambridge University Press, 2002), 88ff.

[961] Schelling, *On University Studies*, 50.

[962] Ibid, 14-15.

The ambition evident here shares the Idealist ambition, but notably, as Weber continues, if concepts, or *Ideas* for Schelling, make the absolute and ultimate (the unconditioned) possible, they thereby make concealed authority and rationalization possible. Pure science, meanwhile, is what Husserl would speak so fearingly of a little over a decade after Weber's lecture as what happens when "science loses meaning for life" and becomes fully objectivist (positivist). For Habermas, accompanying this trend is a resistant interpretivist, hermeneutic tradition. Yet it, too, is plagued by an "objectivist self-understanding … [defending] sterilized knowledge against the reflected appropriation of active tradition and [locking] up history in a museum."[964] Thus, Schelling's ambitions, at the very heart of the research university and its modern charisma, seemed to have failed by the early 20th century. Habermas arrives in the aftermath of World War II, his expectations and hopes for theory looped into its destructiveness and oblivion as a sign, just as for Adorno.[965] For Habermas, the problems ultimately stem from severing "the connection of knowledge and interest." We offer a different suggestion.

The problem is one of severance and division, but not from human interest (or from the "negative" in Adorno's case). If concepts seem remote or result in philosophy and science as twin forms of authoritative knowledge, they are severed from probability, which is the antithesis of authority, the fully predictable absolute, with that predictability being the potential of power. The exploration of *Chance* as opposed to *Ideas* finds in action an orientation to possibilities beyond the observable. Ignoring this, we *will* get a "state philosophy" sooner or later, as various attempts at authoritatively grasping the world come forward with a frame or theoretical system that, as non-probabilistic through and through, asks or demands to be maintained in action.[966] Unlike Adorno's despair at their incapacity to not simply *identify*, and thereby become mythical, concepts can provide "substance in cognition"—but only probabilistically.[967]

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[963] Max Weber, "Science as a Profession and Vocation," in *Max Weber: Collected Methodological Writings,* edited by Hans Henrik Bruun and Sam Whimster, translated by Hans Henrik Bruun (New York: Routledge, 2012/1919), 343.

[964] Habermas, *Knowledge and Human Interests*, 316.

[965] Theodor Adorno, *Negative Dialectics,* translated by E.B. Ashton (New York: Continuum, 1983/1966), 361ff.

[966] See Gilles Deleuze, *Difference and Repetition*, translated by Paul Patton (New York: Columbia University Press, 1994/1968), 60-61; Brian Massumi, *A User's Guide to Capitalism and Schizophrenia* (Cambridge: MIT Press, 1992), 4-5.

Habermas is right about the "methodological prohibitions" that restrict theory, but it is a restriction that applies by forbidding theory to play any but a secondary role in probabilistic reasoning. The *hope* of theory, particularly among those who find hope in critique, is lost when the prohibition on theory as probabilistic concedes the ground to method and data, and now to data science. The idealist revolution would be surpassed by natural science: technology became the conceit of liberation.[968] What remains unchanged, as we have stressed, is that regardless of the mode of engagement, the point of study, specifically what *is* studied: it is objective possibilities all the way down.

Despite all the changes to the space of high theory over the last several decades, theorists only superficially engage in probability without the expertise of methodologists—as with them, rests the kernel of social-scientific truth. Words are a secondary aid to the numbers game. Yet probability is not simply our accounting tool. We can find its concretization in the flows, rhythms, and distributions that mark social life, in the construction of new objective possibilities, and in the finer shades of expectation revealing the production of subjects. To figure out the social effects of probability requires an interpretive social science, but it is one for which the spatial imagination surpasses the hermeneutic. A probabilist finds no equivalent of "social action as text," for example, nor do they transpose themselves into horizons or landscapes that do not take form as *expectations* and *anticipations*, loops into the real but unknowable.[969] What they find are people oriented by beacons linking past and future, moving forward on paths that focus attention and create motivation via optimism. Promises, however endangered, find *confidence* in better states of being that, once lived, can be lived again.

There is nothing closely comparable in this framework to the idealist tradition that shapes the heritage of theory. Perhaps, like Habermas but for different reasons, we should not treat this lack of connection, and the departure we propose, as a significant loss. After all, the idealist turn that began full of possibility would culminate, perhaps inevitably, in paternalistic authority. The founding of the University of Berlin in 1809 would have as its goal, the "spiritual and moral training of the individual," to be achieved "by deriving everything from an original principle," thus "relating everything to an ideal" and "unifying this principle and this ideal in a single idea." The end product of such an institution would be "a fully legitimated subject of knowledge and society."[970] Whatever else this is, it is a story of fixing certain possibilities in place, constructing a range—"the single Idea" (the state) at its head—with the very definition of authoritative knowledge found in the impossible legitimacy of anything else.

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[967] Here we refer to Adorno's famous insight, which, read as probabilistic reasoning, shows a shocking alignment with PP's brain-based insight: ""Mythical is that which never changes, ultimately diluted to a formal legality of thought. To want substance in cognition is to want a utopia. It is this consciousness of possibility that sticks to the concrete, the undisfigured. Utopia is blocked off by possibility, never by immediate reality; this is why it seems abstract in the midst of extant things." Adorno*, Negative Dialectics*, 56. See also, Adorno, "The Experiential Content of Hegel's Philosophy," in *Hegel: Three Studies*, translated by Shierry Weber Nicholson (Cambridge: MIT Press, 1993/1963,1971), 80ff.

[968] Pinkard, *German Philosophy*, 356ff.

[969] Paul Ricoeur, "The Model of the Text: Meaningful Action Considered as Text," *Social Research* 38 (1971): 529-55; Isaac Reed, *Interpretation and Social Knowledge: On the Uses of Theory in the Human Sciences* (Chicago: University of Chicago Press, 2011), 92.

Interpretivists worry about authoritative knowledge, particularly as they find it hidden in critical theory's imputations of interests and capabilities, which removes variability from the dappled world and theorists' capacity to bring recognition to it. But the nomadic trait of probabilistic reasoning introduces more symmetry into this analysis. Whether an interpretation fixes possibilities, or whether it is an idea associated with universality and accompanying authority—all of these are attempts to loop into chance. The idealist, for their part, acknowledges that "lawless will is no will at all,"[971] and, probabilistically understood, law is among the most effective ways of constructing objective possibilities because of the assurance they appear to lend to a subjective looping in. Yet any law begs the question of its *own* objective possibility (its own "Chance" in Du Bois' terms), specifically the possibility of giving and asking for reasons, and how this could rely on anything other than itself for normative authority. In the self-legislating effects of giving reasons, what is reconstructed is the collectivity itself: the "we" involved in self-legislation and participation.[972]

This, we would want to say, is law (or rule) probabilistically understood. What possibilities does it contain? And what else does such a question contain but a *test*?[973] Law, like interpretation, is a way of specifying *Chance,* even if only as a disguised and hidden repetition. To neglect this as the objective creation of possibility is to assume the authority of interpretation or of lawgiving as linked to no outcomes other than those available from the theorists' own definition of them as initial conditions. Action does not, then, matter, in this perspective, as nothing new can appear from it. Theory removed from probability appears like a coin toss in that respect, with not even two possibilities as its distributed range. Yet in this critique, and in its unique way of selecting and affirming as opposed to negating, we can find hints of a new turn in contemporary social theory.

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[970] Wilhelm von Humboldt, "On Germany's Educational System," in *The Rise of the Research University: A Sourcebook,* edited by Louis Menand, Paul Reitter and Chad Wellmon (Chicago: University of Chicago Press, 2017/1809), 105-122, quotations are on p. 118-119.

[971] Leszek Kolakowski, *Modernity on Endless Trial* (Chicago: University of Chicago Press, 1990), chap. 4.

[972] See Ernst Cassirer, *Rousseau, Kant and Goethe* (New York: Harper, 1963), 34-35.

[973] Our inspiration here is, again, Peirce, particularly his famous pragmatic maxim: "Consider what effects, which might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object." The maxim is well-known. Less well-known is what Peirce suggests next: "Let us illustrate this rule by some examples; and, to begin with the simplest one possible, let us ask what we mean by calling a thing *hard*. Evidently that it will not be scratched by many other substances. The whole conception of this quality, as of every other, lies in its conceived effects. There is absolutely no difference between a hard thing and a soft thing so long as they are not brought to the test." Hardness, in this case, is every possibility objectively capable of it, but which can only be revealed via tests. See Charles Sanders Peirce, "How to Make Our Ideas Clear," in *Chance, Love and Logic: Philosophical Essays*, edited by Morris Cohen (New York: Harcourt, Brace and Company, 1923/1878), 45-46. This is a different pragmatist

On Machines

The "new data frontier" is, according to some, poised to upend received knowledge practices and forms of inference with new analytic approaches. However, data science is not radically new in the *longue durée* of philosophical discourse on probability: It marks a methodological engagement with the chance world that, with an assist from computing technology, has managed to surpass limits of statistical practice. Outside the relatively controlled sphere of "structured" data, data science promises to tabulate single events without making them examples of classes. The science of the past was data-poor by comparison, and what counts as methods can now be appreciated as deriving largely from ways of coping with a condition of data-poverty, maximizing the limited times and places when data could flow (relatively) freely and abundantly. For some, the new condition of data-wealth heralds a "transformation of contemporary economy and society…a much wider shift that makes everydayness qua data imprints an intrinsic component of organizational and institutional life."[974] Yet, beyond the technological prowess to accumulate instants as data points, achieving a *continuity* like "everydayness" or structural mimicry like "form-searching," data science remains a brand of frequentism that, in a manner not fundamentally different from Poisson or Cournot, can render action probabilistic only by first transforming it into a data vector.[975]

Whether data science makes for better social science can only be answered if we are prepared

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inspiration for social theory than its link to human interests and deviates, as we have argued, from the present "new pragmatist sociology."

[974] Ioanna Constantiou and James Kallinikos, "New Games, New Rules: Big Data and the Changing Context of Strategy," *Journal of Information Technology* 30, no. 1 (2015): 44-57, quotation is on p. 48.

[975] Mario Carpo, *The Second Digital Turn: Design Beyond Intelligence* (Cambridge: MIT Press, 2017), 40ff; Peter Denning and Matti Tedre, *Computational Thinking* (Cambridge: MIT Press, 2019), 155-56.

to ask whether action can (and should) be "datafied" as recordable, digital traces while forgetting completely about interpretation. If data science can outflank sociology, as some fear (or hope), this is mainly because sociologists' current conception of action, completely disconnected from probability, cannot put up any resistance. Those who remain unconvinced that theorists will ever find an adequate analytic definition of action recommend that sociologists focus on policy-relevant data analysis instead, using our pedagogy and research to equip ourselves with toolkits now necessary to provide access to the objective dimensions of the social world.[976] If probability is entirely external to action, so this argument goes, then turning to probability is *per force* a turn away from action.

Yet data science could not guarantee such an analytic breakthrough if it did not already feature a theory of action. In this theory, "data extraction," or the datafication of action, comes before the kind of predictive behavioral modification in which what we might call, after Weber, objective possibilities are quite literally presented to actors as an algorithmically modulated expectation or prediction. In the case of credit scores, objective possibilities consist of possible futures classified by risk potential. Algorithmic digital capitalism can make "good matches" between people and products, news stories, or social media posts, entirely on the basis of information flows "appear[ing] to come from within—from cues about ourselves that we volunteered, or erratically left behind, or that were extracted from us in various parts of the digital infrastructure."[977]

A probabilistic sociology identifies definite arrangements in relation to *ranges* of possibility. It is on these grounds that we pursue novel comparisons and analogical theorizing.[978] The generalizability of prediction, more specifically, allows novel comparisons of the presence or absence of objective probability in different times and places, specifying historically emergent factors creating pockets of predictability, and the different orientations that can loop into these formations, shaping expectations and anticipations. If social formations of all sorts consist of possibilities repetitively made into definite arrangements, then sociologists can abstract from this interface and such forms in specific examples, analogizing between otherwise distant cases. The challenge, then, is to theorize social constructions as a mode of prediction in action.

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[976] Duncan Watts, "Common Sense and Sociological Explanations," *American Journal of Sociology* 120, no. 2 (2014): 313-351.

[977] Marion Fourcade and Kieran Healy, "Seeing Like a Market," *Socio-Economic Review* 15, no. 1 (2017): 9-29, quotation is on p. 17.

[978] Diane Vaughn, "Theorizing Disaster: Analogy, Historical Ethnography, and the *Challenger* Disaster," *Ethnography* 5, no. 3 (2004); 315-347.

Consider first that "anticipation of classification," as we have described it, works in a not dissimilar manner as prediction using "behavioral data" and machine learning's own attempt to make our action horizontally continuous rather than veering off-course. For instance, among the most familiar encounters with digital infrastructure comes when we interface with a digital thing found to have rich predictive signals. Consequently, algorithms generate a classification that, likewise, works according to anticipation by guessing based on a history of traces left behind about us—in particular, this one specific taste—to track and lead us toward certain products. As a data vector, our interface with this particular thing requires that artificial intelligence modulate the equivalent of an avatar, reassembling it according to what are now singled out as "key attributes."[979]

To put this in probabilistic terms, the process requires an expropriation using digital control. Because actors *already* predict, predictive analytics can hijack this capability; if human actors did not already predict, we should not assume the profit potential of "human futures" to be so vast and remarkable. The predictions of data science, to hijack a Schutzian turn-of-phrase, are "second order" predictions that piggyback on the "first order" predictions actors produce as they make their way through the world.[980] Presumably, then, if we understand the predictive capability that we already exercise as actors, this can provide a basis from which to resist a digital architecture that targets this capability and works to expropriate the *means of prediction*.

The power of prediction becomes observable here as a power over a classificatory *pattern-recognition* and over basic action as predictive *pattern-completion*. Power in this form eludes many contemporary accounts, as it seems to operate not via the well-worn structuration formula of "constraint and enablement" but via *repetition and control* instead, based on the possibilities of data to create what approximates what we might refer to as a *singular cognitive authority*.[981] Some scholars have described this as a potential return to the kind of information asymmetries seen in the pre-Gutenberg era when cognitive authority had not yet diffused because of print and literacy.[982] The effect is a channeling or canalizing of action that would not otherwise occur if prediction were allowed to happen "in the wild" rather than through an algorithmic modulation. Thus, to replace the objective chances that an agent confronts, loops into, and starts using for action appears as a novel form of power. The anticipations made *by* actors, in this case, compete with the predictions made *about* them through algorithms that work on agglomerated data. The goal? To breach the data/action barrier and narrow the predictability divide between people and their data-derived "avatars."[983]

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[979] Alberto Cevolino and Elena Esposito, "From Pool to Profile: Social Consequences of Algorithmic Prediction in Insurance," *Big Data & Society* 7, no. 2 (2020): 1-22.

[980] Alfred Schutz, *The Problem of Social Reality: Collected Papers I*, edited by Maurice Natanson (The Hague: Nijhoff, 1962).

[981] The sociologist of science Barry Barnes describes an ideal-typical case of a "society wherein a specific form of cognitive authority is allocated entirely to a single individual, acting in a recognized role. Such an individual may instantiate a term by fiat. He may be entitled to pronounce any entity an S, or any entity of kind A an S, and thereby make it an S" (p. 526). Such a society is an extreme case, in which knowledge can be "intensely self-referential and completely self-validating" (ibid). This knowledge is self-validating, meaning that it involves patterns named earlier as specific designations, with every new learner acting as a "confirming instance" of the knowledge. The "sole distributor" need not

Accordingly, much is at stake in the struggle over and around prediction. As control over the *future*, prediction can be used to exercise power over the *present* based on the patterns that it finds in the *past*. On these grounds, we find different uses of prediction: for-profit prediction, social policy prediction, epistemic prediction, and a host of others, about us and our planetary future, all of which, we *predict*, will only become even more consequential. Probabilistic sociology makes visible a missing variety of prediction-in-action, one overlooked or explicitly dismissed by scholars since the early 20th century. Uncovering prediction in action at the heart of these other varieties helps us understand the full scale of their implications. But this demands, in turn, that power be understood as operating on this front rather than those that are more familiar. What, then, does power look like when it works through what appears like our own "good matches" rather than an exogenous disciplinary standard or in overt violence?

If we update these insights to the present, the redemption of theory by Habermas, among others, tried has failed. The designer and theorist Benjamin Bratton remarks, in his study of software "sovereignty" *The Stack*, that he noticed his design students took a strong shift away from theory

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have a connection to pattern-recognition on any other terms than ones she defines. On the other extreme, "there is no clear concentration of cognitive authority." Knowledge will still "retain a self-referring character," yet in circumstances without a cognitive authority, the "simple self-reference," as Barnes (ibid) calls it, is "replaced by spaghetti junction." Knowledge may still have local validity, and may even involve reference to assertions or applications of that knowledge; but lacking the weight of cognitive authority, knowledge is vulnerable to a "parallel stream of judgments" (ibid). More specifically, habituated patterned-recognition overcomes any claim to "privileged" pattern-recognition. See Barry Barnes, "Social Life as Bootstrapped Induction," *Sociology* 17, no. 4 (1983): 524-545.

[982] Shoshana Zuboff, "Big Other: Surveillance Capitalism and the Prospects of an Information Civilization," *Journal of Information Technology* 30, no. 1 (2015): 75-89.

[983] David Lyon, "Surveillance, Snowden and Big Data: Capacities, Consequences, Critique," *Big Data & Society* 1, no. 2 (2014): 1-13.

sometime in the late 1990s, replacing this interest, and all of its accompanying *human* interests if we believe Habermas, with an interest in software as their primary "tool for thought."[984] They have never returned. Questions that required theory to answer or even to ask and envision can now, according to some, be answered without any mention of it; learning *via* machine, suitably programmed, its user with the right aptitude, can provide for both question and answer. Bratton observes that as technical "analysis" has replaced conceptual "synthesis," a certain uniformity seems to have coincided. The contingencies of the design process have been subsumed in no small part by the number of options available in the market for software and its degree of consolidation. "Small problems" have assumed center stage; a sense of the whole and an all-too-human interest in grasping what it might be has faded.

On Fate and Fatedness

The contingency of human existence is not a new idea and the range of inferences we can make here are far from limited by the narrow terms with which we have presented them.[985] To conclude, we can use an example far more widely ranging, as it deals with contingent existence, and more specifically *fate*, using techniques of probabilism. In 523 CE, the Roman statesman Anicius Manilus Severinus Boethius wrote a book from his prison cell, awaiting what would eventually be his execution based on a false accusation. *The Consolation of Philosophy* would become a widely read text of the European Middle Ages, and for good reason it seems. Written as a dialogue between Boethius and another whom he calls "Lady Philosophy," the *Consolation* unfolds as a richly stylized treatise on a heavy subject: namely, *chance* or *fortuna* and the very possibility of the accidental and unexpected event. Boethius should know: he has been wrongly imprisoned and knows that a safe resolution to his predicament is unlikely. He writes as a man condemned to a fate. He is not interested in how this happened (he knows the causes all too well). He is interested in how it could have *possibly* happened. His interlocutor, Lady Philosophy, teaches him that while his imprisonment and impending doom may appear as a misfortune, it is simply the manifestation of an ever-changing fortune, the spinning *rota*

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[984] Benjamin Bratton, *The Stack: On Software and Sovereignty* (Cambridge: MIT Press, 2015), xvii-xviii.

[985] Boethius, *The Consolation of Philosophy,* translated by David Slavitt (Cambridge: Harvard University Press, 2010).

di fortuna (wheel of fortune) to be exact, which continues on and on.

His new companion tries to convince Boethius that his fate distresses him only because he does not understand it:

> You should have recognized that it was never in your control and that the visit of the unreliable goddess is a sure sign of misery to come. You should never confine your attention to what is before your eyes at the moment but consider too what the future is likely to bring. You knew the mutability of Fortune and you should have inured yourself against her constant threats of betrayal that too often inspire fear and flattery from those she has momentarily graced. If you submit your neck to her yoke, you cannot then complain about what happens to you or how the mistress you have yourself chosen is treating you badly. You can no longer bargain with her, tell her what is fair, or how long she should stay, or under what circumstances she may depart from you. If you spread your sails before the wind, then you must go where the wind takes you and not where you might wish to go. You want to try farming and sow your seeds on the earth, then you must expect barren years as well as years of abundance. If you worship her, then you are her slave and cannot question her. Would you presume to stop that wheel of hers from turning? If you could do that, it would no longer be the wheel of Fortune (*rota di Fortuna*), would it?[986]

The wheel of fortune attempts to grasp a providential structure where our usual notions of time and sequence do not signify. For Boethius, even if we figure out causal sequences, this leaves out a divine knowledge that seems to foretell events.[987] What Boethius faintly glimpses here is not essentially different from the highest ambitions of data science. There, too, we find the hope of discerning a system that creates the appearance of inevitability in time; though, as Boethius himself realizes, inevitability is merely one way of *orienting to chance*.

Yet, there is insight in simply linking what rapidly takes shape as a higher formal unity through digital loops to this sort of eternal question. As Boethius learns in his own engagement with fate and the harsh outcome constructed for him, eternity is non-time, and everything there is "One" or self-identical. There are no differences, just as there are no instants that contain twists of fate. Words like "eternity" and the "One" are simply cheap imitations of the inexpressible; for we do not know them intimately. What we know is movement, action and time, or the finite and profane opposites of what exists absolutely (unity, quiescence, immobility, eternity). Finite beings cannot truly "be," as each eruptive instant, each contingency and unexpected consequence, forbids a true identity. Yet, lives of contingency and accident, such as we are all fated to live, can still serve a purpose, as they lead to self-understanding. Boethius comes to the realization, in contemplation of his harsh fate, that our finite world of non-eternity, in which time exists, in which we must act, and which confronts us constantly by things external to us ("objects"), is a world that *must be*, as only through the experience of chance can the soul, which is all that persists across *these* tests, have its needed odyssey. Only from what is conditional can we reach what is absolute or necessary.

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[986] Ibid, 29-30.

[987] Ibid*,* 146-48.

The *rota di fortuna* is an almost perfect demonstration of what Cassirer calls "mythical thought."[988] This is a style of reasoning that cannot admit chance. It instead gives everything a purpose. But, as Cassirer suggests, any strict separation of mythical thought from "theoretical thinking" should not be assumed so easily; it is possible, too, for the "theoretical science of nature" to encounter chance. Here, a chance event is what happens that is derivable from a "form of general lawfulness" or predictability.[989] Like Boethius, we could come up with causes for this event, but that would not mean we would know the event in question as *possible* for what just occurred *to* have occurred. For our purposes, this introduces a different task to science.

Boethius does not understand his fate because it seems to be completely disconnected, out of the ordinary, coming out of nowhere, from what he is familiar with and accustomed to. He comes to understand it by making it *continuous,* by seeing how it *could* be expected once he accounts for the eternally rotating wheel of fortune (which, as Cassirer and "mythical thought" would suggest, can account for anything by making it possible). Equivalents to wheels of fortune always do the same; they make events come *next* in a continuous sense, as extensions of a range of possibilities. The events in question do not *necessarily* follow, but this does not mean they are *contingent*; they are instead a real *potential*. Explanations of this sort could be called the *Boethian*.

The tragedy is that in digital loops, the models of realization might seem varied but are in fact isomorphic. This is something very different from Boethius' tribulations. The symmetry with data science, and more specifically in its proprietary uses as a means of creating the future, shows that the only real difference between a digital and non-digital looping is how possibilities are selected and affirmed. The power that comes from controlling the loop is its covertness and concealability. As Bourdieu attended to, above all, the doxic blinders that keep things peripheral and invisible just to attend to what is possible or, even more apparently, *probable,* can only be destroyed practically, when a loop breaks, when expectations and chances mismatch and what we have remained blind to forces itself abruptly into our attention space.[990] In probabilist terms, we can finally see the range of possibility responsible for what we expect as probable or even necessary, and it is only at this time, when the spell is broken and we lose the perceptual and cognitive fluencies we once had, that we can engage in creative, and potentially democratic, social action, subjecting a range of possibility to tests of inclusion, participation, and justice.

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[988] Ernst Cassirer, *The Philosophy of Symbolic Forms, Volume 2: Mythical Thought* (London: Routledge, 2020/1923).

[989] Ibid, 59.

To lock into a data-driven loop involves a capture of possibilities that we can infer from the source, because it derives from *us* or more specifically our past "volunteering" of data in our actions. We are driven forward by an optimism found in our past engagements, and in the loop we embody the promises of more. The better states that we embody find this specific recognition: the absence of a particular content is what we seek to rectify. The task is not fundamentally different from the idealist task and the purpose of theory. Theory, too, can be a source of hope found in states of better being, making what appears before us misrecognized and misfigured. We loop into a transcendental sphere, in this case, fully clarified (for the idealist) only in thought. *Who* formed the law, or more accurately, how did the range of possibility come to be constructed? We can ask this question of anything that, in probabilistic terms, attempts to understand vertical capture and how this makes social action as the horizontal movement through time adequately caused by something other than consciously chosen beliefs and desires. Such a framework presents us, as passionate and living beings, who are also constructed through engagements with chance, with an urgent question of fate.

We remain subjects in relation to the law because we can break it. As Weber emphasizes, we can probabilistically judge when it is *possible* to break the law without the typical consequence. Are we also a subject in a digital loop? For this loop, we are neither consumers nor users; rather, we are its component parts. *Our* action, as our engagement with chance, transforms into *its* data, as a machine engagement with the same, in an exchange of information. We cannot probabilistically judge when the loop applies, or when our action is *only* action and not also data. We cannot tell the difference between what we exchange and what we are given. The better states that we embody are what we seek after as we correct errors that draw our attention and fulfill our expectations. In the data stream, "content" defines our range of possibility and demonstrates a progressive increase in the proportion of a *constant* capital.[991] It acts as a control on the future by ensuring our continuous engagement in the loop.

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[990] Pierre Bourdieu, *Outline of a Theory of Practice* (Cambridge: Cambridge University Press, 1972/1977), 168-69.

This implies that we do not really roll the dice, as there can be no outcomes in the digital loop. The tests that create analogies and similarities are united by us, though they do not promise self-understanding, as does the Boethian odyssey and its vale of tears. In the data stream, it can seem as if we pass through a similar world of time, a world without eternity, a world of constant change, yet we will find no culmination at the end. The loop cannot, seemingly, be broken, as we cannot locate ourselves in a probabilistic order and question its unity. It cannot seem exterior to us, as in a vertical capture. When the means of prediction have been fully expropriated from us, when the loops we are in are entirely digital constructs, we bear fates or destinies that tell us nothing about ourselves, in which we cannot find our own reflection. Just think of the opaque fate and merit-lessness of "going viral."

In the "The Social Psychology of the World Religions" and "Religious Rejections of the World and Their Directions," two essays that Weber published after his 1913 *Logos* essay, we find a proposal for a probabilistic core of religion in what Weber describes as the "incongruity between destiny and merit."[992] He takes it as a point of focus for the comparative study of religion. Destiny implies courses of events that are impersonal and irrational in a subjective sense, yet also something that cannot be avoided: for example, the certainty of death. Merit can be defined only in relation to destiny. It finds a connection to a right, legitimate, or meaningful destiny: a life in which "meritorious actions and intentions correspond to the way in which the world is 'really' ordered."[993] If a destiny is "merited," then no other outcome *should* have been possible; it remains subjectively adequate.

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[991] Kate Eichorn, *Content* (Cambridge: MIT Press, 2022), 85-88.

[992] "The metaphysical conception of God and of the world, which the ineradicable demand for a theodicy called forth, could produce only a few systems of idea on the whole—as we shall see, only three. These three gave rationally satisfactory answers to the questioning of the incongruity between destiny and merit: the Indian doctrine of Kharma, Zoroastrian dualism, and the predestination decree of *deus absconditus*." Max Weber, "The Social Psychology of the World Religions," in *From Max Weber: Essays in Sociology,* edited and translated by Hans Gerth and C. Wright Mills (Oxford: Oxford University Press, 1946/1915), 267-302, quotation is on p. 275. This essay and "Religious Rejections of the World and Their Directions" were both published in the *Archiv für Sozialforschung* and later collected after Weber's death in the first volume of the *Gesammelte aufsätze zur religionssoziologie* (Tubingen: J.C.B. Mohr, 1922). Notably, the "incongruity" [Inkongruenz zwischen Schichksal und Verdienst], comes as part of Weber's critique of Nietzsche's theory of *ressentiment,* which he introduces by citing the different "*Lebenschancen*" of the disadvantaged. Gerth and Mills translate this as "life-fate." Despite the apparent centrality of the "incongruity" for Weber's sociology of religion, it has received comparatively little scholarly attention. A notable exception is Gershon Shafir, "The Incongruity between Destiny and Merit: Max Weber on Meaningful Existence and Modernity," *British Journal of Sociology* 36, no. 4 (1985): 516-30. See also Ann Swidler, "Foreword," in *Sociology of Religion* (Boston: Beacon Press, 1993), xvi.

If Boethius tells us of chance as divine knowledge, this has bearing on the incongruity, as divine knowledge stands in relation to our experience of chance as *deus absconditus* (e.g., "the hidden God") which, according to Weber, serves as the most effective means ever invented for resolving the incongruity by attributing an unknowable divinity at work in the mismatched destinies, ones that can find no merit. Yet the historical breaking of this "religious totality" ruptures with any reliance on "unknowable" divine processes at work in chance mechanisms. In the wake, politics can appear as a solvent, as capable of directing destiny in line with doctrine that promises order and mobilizes through a political cause or project. In bureaucracy, an overlap of destiny and merit becomes achievable, as the bureaucrat has the capacity to adjust their inner convictions to whatever destiny might choose. They can make order regardless of the directions they are given, which is why, so often in modernity, social justice must ultimately pass through bureaucracy's state of exception.[994] This is one the reasons why Weber found bureaucracy so alienating, but seemingly indestructible: bureaucrats are the most successful order-making creatures in their encounters with chance. Bureaucracy can do this without reconciling merit and destiny in society at large. More generally, politics tries to suffice in place of an unknowable divine while confronting chance mechanisms, say, on the battlefield by making death in that site a destiny *independent* of meaning. A soldier can believe she dies for a cause as a destiny created by the polity, but that destiny must remain unquestioned—a perfect demonstration of order-making effects of the polity.

Transcending the limits of bureaucracy, "charisma" appears in the gap of merit and destiny that remains in spite of politics. It is uniquely capable, in Weber's assessment, of shifting orientations entirely, by creating new merits directed at new destinies. But charismatic flashes in the pan, by and large, cannot last long in the face of overwhelming incongruity. If those situated closer to rationalizing centers ("intellectuals") search for consistency in the face of destinies that come like fate, those more distant from such centers ("the masses") tend to desire just compensation for what has been done to them, which also conflicts with the formalism of rule-following demonstrated by those less peripheral to a rationalizing center, oriented by rules not concepts.

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[993] Shafir, "The Incongruity between Destiny and Merit," 519.

[994] Bourdieu's influential analysis of modern education systems finds its focal critique, in a sense, in its demonstration that education systems are almost by design functioning as hosts and propagators of self-perpetuating loops removed of merit, destinies made perfectly contingent as the inheritance of birth.

For Weber, science cannot be a replacement for the collapse of divine knowledge and its reconciliation of merit and destiny. Still, Weber himself preferred "science as a vocation" under the circumstances, because science alone could "force an individual to give an account of the ultimate meaning of his own conduct." It could, in other words, pose the very question of the incongruity of destiny and merit, represent an approaching destiny, reveal how a "merited" order really isn't, and to inspire accounts of this incongruity with none of the conciliation of *deus absconditus* or its *rota di fortuna*.

The fragmentation of a religious totality results in a dappled world, a proliferation of independent probabilistic orders propelled "towards making conscious [their] internal and lawful autonomy." In each of these, an overlap of merit and destiny becomes relatively possible. Outside of distinctive pockets of predictability, we encounter a passage of time without sequence, instants without durations, and outcomes that come like fate with no account of meaningful order. Yet within a probabilistic order, a fate *could* be merited and destiny made explicable by what the all-too-human concepts of adequate cause and outcome *can* signify. Weber found the probabilistic dynamics of the "erotic sphere" to be particularly noteworthy as an exception that proves this rule: "no erotic communion will know itself to be founded in any other way than through the mysterious destination for one another: *fate*, in the highest sense of the word."[995] Even if a partner appears entirely unexpectedly, as a result of obscure chance machinations impossible to rationalize (e.g., "among the many, suddenly this one?"), for eroticism (in Weber's understanding) this is not incongruous but the very source of the (sacred) meaning of the bond itself. Merit, however, cannot be admitted for this to be the case: "Rarely does life grant such value in pure form. He to whom it is given may speak of fate's fortune and grace—not of his own 'merit.'"[996]

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[995] Weber, "Religious Rejections," 348.

[996] Ibid, 350.

In a fully digital world, there will also be no opportunities for merit, though this is not exactly because we will be forbidden from ever having a chance. On the contrary, it can seem like we have every chance; the range of possibilities can seem limitless. Yet Boethius' fraught path will no longer be available, as there will be no engagement with chance and therefore with fate.[997] And why would there be? To invite it in would result in the opposite of a fully "modulated," predictable subjectivity.[998]

Merit and destiny incongruities cannot be interpreted independently of subjective expectations that loop into objective probabilities. The significance of erotic partnership is directly connected to the subjective expectation of an improbability, not by a causal sequence that we could diagnose, but by reference to the same real but unknowable realm for which Boethius' *rota di fortuna* has its application, called upon in times of need. Destiny, more generally, attempts to signify that realm, and the intervention of merit is equivalent, here, to the causal sequences that our concepts *can* signify. Weber's larger point gives attention to *Chance* (in his case) as what has been constructed from Boethius's mysterious space of divine machination, which has a determinative effect without being subsumable to what we could ever diagnose as a causal sequence. *Sans* ideas, it remains a source of meaning in the world.

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[997] Kries argued that mechanical systems were most remarkable because they produced closely analogous *Spielraum*, however we divide them into outcomes and whoever is the source of expectation. The comparison to machine interface and digital looping suggests a similar point: individuals become closely analogous *Spielraum* with fewer individual anomalies. This is just another way of saying they become more predictable as they are less individual, less subjective, so powerful can be a machine-based verticality. See, Johannes von Kries, *Principien der Wahrscheinlichkeitsrechnung. Eine Logische Untersuchung* (Freiburg: JCB Mohr, 1886), 61-68.

[998] John Cheyney-Lippold, "A New Algorithmic Identity: Soft Biopolitics and the Modulation of Control," *Theory, Culture & Society* 28, no. 6 (2011): 164-181; Gilles Deleuze, "Postscript on Societies of Control," *October* 59 (1992): 3-7.

Glossary

Action – any engagement with the world that assumes the form of a forward-feeding trial and reaction of learning and looping. We engage as *parte subjecti*, of expectations and habits, within a real but unknowable world, or *parte objecti* with its potential and probabilities. Action generates sensory inputs through which we can learn these probabilistic environments. Action within a loop can make objective possibilities actual within a given range (and observable/measurable) and mediate between the initial conditions and outcomes of probabilistic orders, maintaining them through repetition. In action, we find an orientation to *Chance.*

Active Inference – the basic cognitive mechanism that maintains a loop into *Chance*. The neural tendency to form generative models allows for a predictive interface with incoming sense data. Thereby, the generative model partially configures a probabilistic environment, allowing for meaningful interfaces that are also characterized by diminished perception.

Adequate Cause – relations of initial conditions and outcomes that occur in ways conducive to expectations. This indicates they are adequately connected within a relatively coherent *Spielraum* rather than relating only through chance causation.

Chance – objective probability as subject to a judgment in action. This is the most direct interface with constituent features of the world. Combined with expectation, this is also the most direct indicator of objective probability.

Chance Mechanisms – events unmarked by expectation or objective probability. They might be objectively possible, but to this point have remained unknown. Because they are unordered, they are the source of chance causation that can be threatening to the coherence of probabilistic order.

Chaos – when there is extreme sensitivity to small variations in initial conditions linked to outcomes, and expectations cannot form. A chaotic order is surprising (and is expected to be) because we cannot judge single-case probability; we cannot loop in.

Expectation – judgment of probability that yields perception of *Chance.* Action as guided by expectation shows evidence of loops. Expectations are not arbitrary or subjective. They show evidence of the past that feeds into the future and create perceptions in the present. Expectations are only possible relative to objective probability. Otherwise the forward feeding in action is more akin to a perpetual guess.

Horizontality – action as it moves through time. In a pure sense, this would be composed of unrelated instants. Yet because of vertical capture and the dispositional formation of habits through learning, instants of time are bound together, in a repeating connection, allowing for order to be generated and maintained through action.

Horizontal Project – a forecasting of action, either individual or collective, that must find subpersonal mechanisms to be maintained, as it counts primarily on perception. This is because any such project can only move forward in time through error minimization.

Initial Conditions – analytically defined, temporally prior phenomena that, in a line of action or in a statistical analysis, find a persistent link to some outcomes, thus binding time and allowing for expectations and/or analytically devised correlations or predictions. A probability distribution applies to initial conditions even outside of frequency counts, as it can designate aspects of a *Spielraum*.

Interpretation – what can stabilize a chaotic order through an intervention in initial conditions that lend a contingent (e.g. symmetrical to other possible interpretations, with no adequate relation to what it interprets) meaning and significance to them.

Looping – a persistent and repeating connection between *Chance* and expectation, such that orders can be constructed as predictable and action becomes less like a test to form expectations. Previously formed expectations can be relied upon. All loops are probabilistic in this sense, though some may rely on descriptions or interpretations to form expectations.

Objective Possibility – the real but unknowable constituent potentials of the world. These exist in time and space as durations and ranges. We learn objective possibility by testing it, which can take the form of action-reaction flows that take the form of expectations, and in statistical methods based on frequency counts. Neither of these create (complete) knowledge of objective possibility; they only asymptotically approach it. Also known as "potential" (or *dunamis*, ability/capacity) in an Aristotelian tradition.

Objective Probability – what objective possibility looks like as we try to know it. Takes the form of repeating, durational patterns, sequences, correlations and rhythms. These are actually existing tendencies that we loop into via expectations. Also known as *Spielraum* and probabilistic orders.

Outcomes – analytically defined, temporally subsequent phenomena that, in a line of action or in a statistical analysis, find a persistent link to some initial conditions, thus binding time and allowing for expectations and/or analytically devised correlations or predictions. A probability distribution applies to outcomes even outside of frequency counts, as it can designate aspects of a *Spielraum*.

The Personal – a level of analysis characterized by semantically accessible beliefs and desires, explicitly stated projects, consisting of goals. An explanation that remains entirely at this level is autonomous, or self-contained, yet it allows for no chance for belief and desire, instead presuming their presence, suggesting a purely nominalistic ("in name only") significance.

Probabilistic Order – constructed of loops between expectations and *Chance*, the repeating connection of which yields relatively coherent spaces of social action. A typology (fields, apparatus, games of chance) can apply to compare and analogize between probabilistic orders. Probabilistic orders differ according to how much they leave to chance ("invite it in") and how much they control it ("tame chance"). Probabilistic orders, whether by design or not, allow for adequate causation.

Prediction Error – sense information that a generative model cannot predict and which is the basic information content of perception. We perceive what we cannot predict, in other words.

Single-Case Probability – probability learned without ("in the long run") frequency counts, often through knowledge of what can be analytically defined as initial conditions. It can reveal certain tendencies in a *Spielraum*. As opposed to contingent, these probabilities can be the source of expectations.

Social Action – any engagement with a probabilistic social order as an orientation to *Chance,* Social action is marked, most of all, by expectations formed *via* the expectations of other actors.

The State – the most fundamental source of objective probability in a modern probabilistic order. This is in large part because the state can authorize interpretations capable of fixing the meaning and significance of initial conditions and outcomes.

The Subpersonal – a level of analysis characterized by semantic inaccessibility. This can contribute to an autonomous explanation focused purely on physiological or cognitive mechanisms, with no apparency in perceptions. Yet, continuism suggests linkages to the personal that allows its terms to be more than nominal (but by no means individual).

Trials/Tests – action that engages with objective possibility and allows for learning (particularly by finding persisting links of initial conditions and outcomes) through reaction to it, thus absorbing its uncertainty. This process can also be designed and administered for the purpose of creating controlled spaces of adequate causation, in which case we find *tests* which channel engagement with an objective potential, limiting the distribution of possible outcomes. Trials and tests mimic statistical testing rooted in frequency counts by allowing for a modeling of real but unknowable probabilistic environments.

Vertical Capture – when expectation generating capabilities are captured by higher level order than a single individual, orienting action toward certain *Chances*. Action thus fulfills, at the levels of groups and institutions, the same maintenance of a probabilistic order through correction of related prediction errors.