CHAPTER 3

Theory
What We Know

> We carve out groups of stars in the heavens, and call them constellations, and the stars patiently suffer us to do so – tho if they knew what we were doing, some of them might feel much surprised at the partners we had given them … What shall we call a thing anyhow? It seems quite arbitrary, for we carve out everything, just as we carve out constellations, to suit our human purposes.
>
> (James, 1907, p. 106)

This chapter develops our second pragmatist proposal that *theories are tools for action*. These tools, instead of mirroring the world, are part of the world. This idea is an alternative to realism on the one hand and relativism on the other. For realists, theories pertain to timeless objective Truths that are independent of human observers and exist behind the buzzing confusion of experience. For relativists, theories are inescapably subjective, bound to human experience and culture. The pragmatist alternative bypasses the subjective–objective dualism and instead focuses on human activity: What does the theory enable us to do?

The term "theory"' is used in various senses (Abend, 2008). Sometimes it is used loosely to refer to the work of great thinkers, to fundamental debates, or to have an observational stance; these are not our focus. We aim to conceptualize narrower theories, that is, theories about a specific phenomenon. People with realist tendencies tend to define such theory in terms of propositions about relationships, often causal, between variables that mirror Reality. People with relativist tendencies tend to define these theories in terms of interpretations, discourses, and ways of seeing. Pragmatism, in contrast, defines theories as semiotic tools crafted (e.g., using common sense, trial and error, or scientific methods) to identify regularities in our interaction with the world that reduce surprise and enable future action.

Pragmatists criticize realism for associating theory entirely with the object, arguing that a theory completely independent of humans would be

incomprehensible and useless. Pragmatists criticize relativism for associating theory entirely with the subject, arguing that this leads to impotent skepticism that fails to take a critical stance on the consequences of knowledge. The pragmatist alternative aims to overcome Descartes' dualism (see Chapter 1) by focusing on the relation between the subject (person) and object (world). From this standpoint, theories are simultaneously consequential and historical; they capture regularities in our relation to the world, but they are also shaped by human interests.

This chapter reviews realist, relativist, and pragmatist approaches to theory. Our focus is on the pragmatist idea that theories are not "mirrors" of the world but tools in the world that empower (or disempower) human activity. We illustrate this pragmatist approach to theory in creativity research to show how various theories open different lines of action (e.g., for individual agency, environmental support, and social evaluation). Overall, we argue that pragmatism focuses on making theories that are useful, constructed through disruptive experiences, and evaluated in terms of their practical and social consequences.

3.1 A Realist Approach to Theory

Plato's allegory of the cave vividly captures the idea that "behind" our infinitely particular, fractal, and continually changing experience of the world are simple, timeless, and absolute Truths (Reeve, 2004). Plato argued that the phenomena we perceive (e.g., horses, tables, and triangles) are akin to mere shadows projected onto a cave wall by a fire. Knowledge, he argued, entails going beyond these shimmering two-dimensional shadows to understand the stable three-dimensional sources. Behind the diversity of horses that one perceives, Plato argued, there is a single Ideal Form of a horse, the essence of a horse, which is valid for all horses and which is the source of all manifest horses. This idea was appealing because it reduced the blooming buzzing confusion of empirical experience to a smaller set of Ideal Forms that were True and timeless and, thus, a seductively solid foundation for knowledge.

> Archimedes, that he might transport the entire globe from the place it occupied to another, demanded only a point that was firm and immovable; so, also, I shall be entitled to entertain the highest expectations, if I am fortunate enough to discover only one thing that is certain and indubitable. (Descartes, 1641, p. 85)

Descartes (1641) found unshakable truth in rationality, logic, and mathematics; geometry was akin to operating with Ideal Forms directly. Descartes speculated that all perceptual experiences are potentially illusionary, such

as when dreaming or hallucinating (Gillespie, 2006a). Imagining an all-powerful daemon manipulating his perceptions, Descartes retreated into thought and famously realized that the only thing he could not doubt was his doubting. This Truth, contained within thought itself, became his immovable point. Rebuilding his knowledge on this foundation led him to privilege rational thought, especially mathematics. For example, the mathematical structure of a triangle (e.g., that all angle sum to 180 degrees) is true independent of any empirical manifestation of a triangle. Indeed, perfect triangles do not exist empirically (each actualization is only an approximation), yet the rational truth is timeless.

In contrast to Descartes' rationalism, empiricism (see Chapter 2) argues that experience is the only reliable source of knowledge and that rational ideas are merely derivative of sensory experience (e.g., the rational idea of a perfect triangle is a generalization of the experience of triangles). In its most extreme variations, empiricism implies that humans are born *tabula rasa*, as "white paper, void of all characters, without any ideas" (Locke, 1847, p. 104). The human mind, reason, and logic develop through experience; thus, rather than being secondary, experience is the sole pathway to Truth. The problem, however, is that experiences can be deceptive (refraction, optical illusions, and hallucinations). Accordingly, the scientific method is a collection of techniques (e.g., for gathering data, testing hypotheses, and making inferences) that aims to separate objective and subjective elements of experience. To this end, Popper (1934) argued, theories need to be falsifiable, that is, stated in ways that observations can contradict. Theories that observations cannot refute, Popper argued, were unfalsifiable and thus not scientific theories.

Limiting theories to falsifiable statements about the world limits the scope of science and potentially fails to take account of underlying mechanisms. Critical realism (Bhaskar, 1975) presents a broader vision of science: It distinguishes between "observations" and the "Real" world beyond observations. The Real exists independently of observations and theories. The problem is that our observations are shaped not only by the Real but also by our expectations. That is to say, only observations, not Reality, are tainted by humanity. Relativism, Bhaskar (1975) argues, makes an epistemic fallacy: Limitations of our epistemology (uncertain observation) are overextended into a limitation of ontology (uncertain Reality). According to critical realism, epistemology is limited, but it does not follow that there is no Real ontology to the world; it just means that we have limited access to it. Critical realism aims to reconstruct the world beyond observations that is independent of humans from the traces it leaves in our observations.

However, critical realism is not just about "realism" but also about being "critical." The problem is that social critique is normative (i.e., cultural, historical). Hammersley (2002) doubts that critical realism can derive what should be based on what is (i.e., deriving "ought" from "is"). There is nothing in Reality that implies social critique; it just is. In contrast, pragmatism can more easily introduce the critical and normative aspect of "ought" because it incorporates human interests from the outset. That is to say, by starting with the impact of knowledge on people and guided by human interests of fairness and liberty, critical judgment follows easily.

Contemporary realists are rarely naïve, in the sense of failing to distinguish their theories from Reality. Few openly state, with complete confidence, that their theories capture timeless and universal Truths. The cautious scientist knows that measures are "constructs" in researchers' minds. The subtle statistician understands that averages, standard deviations, and latent variables are not "behind" the diversity of datapoints but are strategies for researchers to simplify the complexity of empirical observations.

However, in practice, the language of research often slides into naïve realism. Theories are routinely defined in terms of things-in-themselves, not observations. For example, Corley and Gioia (2011, p. 12) define a theory as "a statement of concepts and their interrelationships that shows how and/or why a phenomenon occurs." Thus the "constructs" slide from being relational (between researchers and the world) to being independent of the research process (about the phenomena itself). The researchers, who are sensemaking about their observations and experiments, are effectively erased from the theories they produce. At a statistical level, the averages and latent variables that simplify complex data may not describe anyone in particular, yet they substitute for the phenomenon itself (Fisher et al., 2018). Seduced by the certainty of infallibility and and the completeness of formal unity, cautious claims grounded in contextual observations give way to an imperialistic attitude that overextends itself, is found wanting, and thus weakens science and, ironically, opens the door to relativism (Midgley, 2003).

3.2 A Relativist Approach to Theory

The relativist approach to theory is a radicalization of the skeptical argument against realism. Ancient Greek skeptics argued that all knowledge is inescapably a human product. Pyrrho, probably influenced by Buddhism (Beckwith, 2017), argued that certainty was self-evidently impossible because people disagree about things, things change over time, and all

observations depend upon assumptions shaped by custom. There are six refinements of these classical skeptical arguments.

First, Darwin's (1859) publication of *Origin of Species* bolstered the critique against timeless Truths. While Darwin's contribution is primarily to biology, Dewey (1910b) argues that he also made a fundamental contribution to philosophy. Species were prototypical Ideal Forms, especially humans (e.g., made in the image of God). Darwin demonstrated that species change and evolve. This undermined the idea that each species was "of a type" that was clear and distinct (i.e., if horses were evolving, there could not be an Ideal Form of a horse). Darwin, as read by Dewey, inverted the realist hierarchy. The blooming variability is not noise secondary to Truth, to be stripped out; variability and noise are the truths of evolution.

Second, studies of the history of science also undermine the idea of timeless Truths. Science does not progress uniformly; there are moments of revolution when there is a paradigm shift, and what was once taken for granted becomes questioned (Kuhn, 1962). Gravity was conceptualized by Aristotle as the tendency for objects to return to their origin, Newton as the gravitational force, and Einstein as a bending of spacetime. This historicity is even more evident in the social sciences. Theories about mental illness and criminality have changed hugely, shaped by shifting power relations (Foucault, 1973, 1975). Scientific racism, widespread in the early twentieth century, used ideas from physical anthropology, psychometrics, and genetics to create a hierarchy of discrete races that justified colonialism (Said, 1978). These theories, now debunked (Gould, 1981), reveal the historicity of truths and also the role of human interests and politics in shaping any so-called Truth.

Third, surveys of scientific progress challenge the reductionists' dream of simplicity "behind" complexity. In contrast, the evidence points to a reductionist's nightmare. Behind ostensibly simple observations is irreducible, fractal, and spiraling complexity (Stewart & Cohen, 1997). Although there have been some remarkable successes in finding patterns behind complexity (e.g., Darwin's theory of evolution by natural selection, Einstein's general theory of relativity, and Crick and Watson's description of the double helix), there have also been many domains of escalating complexity. With telescopes and microscopes, the more we zoom in and out, the more complexity we discover. The microscope finds a universe within a drop of pond water. Consider the growth of knowledge in encyclopedias. The *Urra=hubullu*, created in Babylonia in the late first millennium BC, comprised twenty-four clay tablets. Pliny the Elder's *Natural History*, created in Italy in AD 79, synthesized 2,000 works and 20,000 facts into 400,000

pages. The *Encyclopedia Britannica* has about forty million words, and Wikipedia has about four billion words in English. Philosophy spawned moral philosophy and natural philosophy, which spawned a growing list of disciplines with countless subdisciplines (Abbott, 2000). Encyclopedias are not shrinking. Disciplines are not concluding. In short, knowledge is not getting simpler; it is getting ever more complex, subtle, and intricate – especially in the human sciences.

Fourth, theories are necessarily incomplete. There is always a gap between our theories and the world. Imagine the innumerable interactions of a rock rolling down a hill, tumbling on scree, bumping into larger rocks, and brushing tufts of grass. What simplicity could lie behind it? One could try to model the interactions mathematically, but the number of variables and complexity of the interactions would rapidly spiral out of control. While the first few milliseconds of the tumbling rock could be modeled, the rock and the model will diverge over time. Sensitivity to initial conditions makes precise prediction impossible; thus, we rely upon incomplete probabilistic models (Yao & Tong, 1994). Quite likely, the rock rolling down the hill is the most accurate representation of itself; arguably, no simpler but equally accurate version can be made. Extrapolating, it is likely that the most simple and accurate model of the world is the world itself.

Fifth, theories are not the phenomena they describe. Imagine that one did create a perfect model of the rock rolling down the hill – a quantum computer simulation, instantiated in millions of lines of code, with an unmanageable number of unfeasibly precise measurements setting up the initial conditions. This algorithm, however, is quite different from the rock. It would be absurd to suggest that the rock is doing mathematics while rolling down the hill. The rock is just doing its thing; the mathematicians, modeling the rock, are just doing their thing. The description is not the thing (Deacon, 2011). Equally, the description of a distribution (e.g., a mean or standard deviation) is not the population, and to reify the numeric mean above the distribution itself is an unhelpful inversion. The seductive temptation is to view statistical descriptions as akin to Plato's Ideal Forms – the underlying Truth that generate the messy data. But these statistical techniques reduce diversity and risk creating nonexistent phenomena. On average, people drive near the middle of the road, raise 1.25 children, and have one testicle. While these maybe useful simplifications, they are not Reality. The actual mean often does not exist; only context-bound ideographic cases exist (Hayes et al., 2019; Valsiner, 1998). Nevertheless, it is common for researchers to build their models using means and latent variables, created at the level of groups, and assume these

apply to individuals (Fisher et al., 2018). This can lead to theories that work statistically but are disconnected from what is actually going on.

Finally, theories are additions to the world. Not only are theories, or any descriptions, not the phenomena that they describe but they are also new phenomena in the world (that need new descriptions). Instead of describing the world, a new theory is a growth in the world that makes the world more complex. New theories are not mere descriptions; they have consequences and interact with other aspects of the world. Sometimes these consequences are limited to academia (e.g., getting articles published, securing tenure), and other times these consequences impact society (e.g., ideas about feminism, persuasion, nudging). These consequences are independent of the veracity of theories. For example, classifying mental illnesses has proved challenging due to the paucity of pure cases and the bewildering diversity of presentations (Hayes & Hofmann, 2020), leading to ongoing debates about criteria. However, despite the manifest failure to uncover the simplicity behind the symptoms, these criteria have been consequential. These criteria organize who receives what treatments (Rose, 1998). Based on criteria that now seem historically peculiar, people were medicated, incarcerated, and subjected to harmful procedures (Foucault, 1973). Thus, these criteria do not pull back the veil on Reality; rather, they expand upon reality, adding another layer of meanings through which actions are guided.

These six skeptical arguments, among others, have led some researchers toward a relativist stance. This stance focuses on how knowledge is created through social interactions, how knowledge changes over time, the effects of knowledge, and how knowledge can benefit some groups to the detriment of others. These approaches encompass a wide variety of ways of thinking about reality (the everyday truths of practice) and Reality (timeless truths), but they are broadly described as "constructionist" (Hacking, 1999). These approaches do not necessarily reject Reality, but they do bracket it aside as unhelpful when analyzing how knowledge is actually constructed. A degree of relativism, they argue, is useful for critical projects that aim to uncover ideology within what is taken for granted as Real (see the discussion of postmodernism in Chapter 2).

The problem with relativism in general, and postmodernism in particular, is the tendency to go from the epistemological limitation (we encounter the world only through our experience) to the ontological limitation (the epistemic fallacy; Bhaskar, 1975) or even to an epistemological helplessness and skepticism (we cannot know anything about the world). Being unable to know the world as it is does not mean that all knowledge is equally subjective;

it just means that all knowledge is limited. Ignoring this subtlety and adopting an extreme relativist position has two problematic consequences.

First, extreme relativism implies that evaluating the quality of knowledge is impossible. Knowledge only ever expresses something about its producer and can only be valued as such. On the one hand, this renders methodology meaningless. Why attempt to systematize and improve knowledge production if there are no criteria for quality? On the other hand, assessing the quality of research becomes impossible. Without asserting the quality of some research over others, the entire operation of science dissolves; any discomforting finding can be dismissed as mere interpretation. In contrast, from a pragmatist standpoint, the historical record provides data, or facts, that cannot be dismissed and that any theory needs to account for.

Second, extreme relativism can neuter the critique. While it is often ethical and valuable to give voice to marginalized perspectives (e.g., minorities, patients, children), it does not follow that all marginalized voices are equally valid. Should we be tolerant of intolerant views (Verkuyten, 2022)? Sometimes marginal voices want to impose upon others, spread ideology, or rewrite history. Are conspiracy theories (see Chapter 2) about stolen elections, climate change, and the Holocaust as valid as evidence-based views? Relativism not only has trouble countering such views but can even contribute to them (Wight, 2018). In contrast, from a pragmatist standpoint, such conspiracy theories are dangerous and can verifiably lead to undesirable consequences.

Relativism causes problems both within the academy and beyond. Although relativism is often the paradigm of choice for critical researchers, ironically, it can undermine the potential of critique by making it difficult for good research to gain traction and easy for it to be dismissed. Beyond the academy, relativism can be used to undermine coordination on collective issues, such as health, inequality, and climate change (Conway & Oreskes, 2012). It enables dismissing disruptive facts as "fake news" countered with "alternative facts" (Cooke, 2017; Gillespie, 2020b). Even without refuting rigorous knowledge, merely sowing doubt and confusion undermines our capacity to address problems of common concern (Conway & Oreskes, 2012). However, naïvely asserting realism risks exacerbating skepticism because science is fallible and filled with human interests. Theories will fail and be revised, they will become historical, and they may eventually be seen as ideological and thus fodder for post-truth arguments. We need to acknowledge the historicity of science while also retaining the ability to distinguish between the quality of evidence and theories. To this end, pragmatism provides a way forward.

3.3 A Pragmatist Approach to Theory

Descartes (1641; see Chapter 1) created a dualism between the subjective (mind) and the objective (things). This dualism has shaped both realism (i.e., objectivism) and relativism (i.e., subjectivism). Realism focuses on the object, and tries to exclude anything that is subjective. Relativism focuses on the subject, highlighting how it is impossible to escape the human element. In contrast to both these approaches, pragmatism focuses on human activity as the relation between the subject and the object. Realism locates theory "behind" experience, as an explanation for experience. Relativism locates theory entirely in the subjective side of experience. Pragmatism locates theory in the subject–object relationship: Theory is the means through which the subject interacts with the object. For pragmatism, a good theory enables action vis-à-vis the object by reducing unexpected consequences.

James (1907) criticizes the realist position for taking words, which are tools for socially coordinating in relation to objects, and then imputing them behind the object as an explanation of the object. Realism, he writes, entails

> taking the mere name and nature of a fact and clapping it behind the fact as a duplicate entity to make it possible … But this is like saying that cyanide of potassium kills because it is a 'poison,' or that it is so cold to-night because it is 'winter,' or that we have five fingers because we are 'pentadactyls.' These are but names for the facts, taken from the facts, and then treated as previous and explanatory. (James, 1907, p. 263)

The words "poison," "pentadactyl," and "winter" describe observations; thus, they cannot be explanations for those observations. However, this is not to say that these words are all "in the mind." These terms are useful; they enable action, coordinate interaction, and can reduce surprise. For example, the term "winter" is useful in Europe to describe the recurring pattern of cold weather each year. Although this pattern has held in the past, there is no guarantee it will hold in the future (especially with global warming) or that a specific date in winter next year will be cold – it might not. Nonetheless, the term guides us into the future with sensible expectations. It is not cold because it is winter; we put away our sunglasses and take out our thermals because it is winter.

Our theories, just like our words, are saturated in humanity. "The trail of the human serpent," James (1907, p. 64) writes, is "over everything." In this sense, pragmatism agrees with relativism but disagrees with the conclusion of epistemological despair. Some theories are

more effective than others. Some theories advantage certain groups more than others. And, some theories, such as pure relativism, can actively undermine the possibility of group coordination to address issues of common concern. Accordingly, despite the challenges, social researchers have a responsibility to advance theories that have desirable consequences.

The pragmatist critique of naïve realism does not undermine science; it protects science. Calling out the overextension of science, along with challenging fundamentalist ideas about timeless Truths, is scientific; it is removing nonempirical dogma from science. It redirects science away from grand metaphysical dramas and toward what it does best: practical empirically grounded investigations that incrementally extend humans' capacity to act effectively in an unknown future. The world is messy, and science is necessarily complex. Midgley (2003, p. 21) writes that this "complexity is not a scandal." There is no grand unifying theory that unveils simplicity behind complexity. Our theories are context-specific guides to action – proliferating in proportion to the increasing number of contexts we encounter.

From a pragmatist standpoint, theories are "for humans" and anchored in the practical consequences for humans. Theories synthesize previous experiences into guides for future action. When pragmatists talk of "facts," they are referring to what has happened (which cannot change despite potentially diverse interpretations), not what will happen (which is always an expectation). Thus, pragmatism makes a sharp distinction between what is in the past (what has happened, independent of current debates) and what is in the future (fundamentally uncertain and in the process of being created, in part, by humans). The aim of science, and most knowledge creation, is to equip us better to navigate and shape an undetermined future.

> Observations of fact have, therefore, to be accepted as they occur. But observed facts relate exclusively to particular circumstances that happened to exist when they were observed. They do not relate to any future occasions upon which we may be in doubt how we ought to act. They, therefore, do not, in themselves, contain any practical knowledge. Such knowledge must involve additions to the facts observed. (Peirce, 1955, p. 150)

Theories are a type of practical knowledge that are derivative of the facts of prior experience. But, as Peirce writes, these aspects of prior experience do not in themselves provide a guide for action; prior experiences need to be integrated, synthesized, and packaged into usable knowledge. Theories, from a pragmatist standpoint, are this repackaging of past experiences into useful guides for the future.

3.3.1 Theory: A Mirror of Nature?

Metaphors are ubiquitous in scientific theories (Lakoff & Johnson, 1980, 1999). Key metaphors in the natural sciences include the big bang, superstring theory, cells, DNA blueprints, and dark matter. Indeed, many scientific debates entail a clash between metaphors (Holton, 1975), such as whether quanta are "waves" or "particles." In psychology, metaphors are widespread, such as the idea that the mind is like a computer with modularity (e.g., long- and short-term memory systems), limited capacity processing, and culture being semantic software run on biological hardware (Leary, 1990). At a deeper level, even basic psychological terms are grounded in metaphors. Skinner (1989) analyzed the etymology of eighty cognitive terms, and in each case, he argued, the terms originated in everyday human activity. For example, the etymological root of "comprehend" is grasp, "agony" is struggle, and "understand" is to stand under. It seems impossible to create theories entirely independent of "the trail of the human serpent" – even mathematics is grounded in embodied metaphors (Lakoff & Núñez, 2000). This ubiquity of metaphors throughout science reveals that all our theories are peculiarly human creations.

Why do metaphors pervade our theories? Just as a tool must be molded for human hands (e.g., a hammer needs a handle), so theories are molded for the human mind. The domain of the most immediate understanding has variously been called the here-and-now (Schuetz, 1945) and immediate interaction (Lakoff & Johnson, 1980). This domain of concrete interaction does not need a metaphor; it is the wellspring of metaphors. We do not use metaphors to understand opening, eating, or talking; instead, we use these everyday experiences as metaphors to understand more abstract phenomena. Arguably, understanding is anchoring an abstract phenomenon in concrete daily experiences.

To use a computational metaphor, a good metaphor is like a compressed computer file, shrinking the cognitive load but remaining on hand to be unpacked when needed. We are, as the cognitivists say, limited capacity processors (Norman, 1967). Most humans can remember only between five and nine random numbers (Miller, 1956). Yet we have managed to write books, create cities, and fly to the moon. A key question is: How have we leveraged our limited capacity? Metaphors are one method of extending memory. Because of their sensuous quality, they are easier to remember than random numbers (Luria, 1968), but more than this, metaphors can be "unpacked" (or "unzipped") using common sense, to reveal much more than is first apparent. A good metaphor can condense many viable paths of

action around an object into a sensuous image. A good metaphor guides its users to insights latent within the metaphor. But metaphors can also be misleading, blinding us by their simplicity to the world's complexity.

Rorty (1981) provided a powerful critique of the naïve realist paradigm, arguing that it has been seduced and blinded by the metaphor of theory as a "mirror" of nature. He argued that theories are merely words we use to talk about the world and coordinate with one another. A sentence, Rorty argues, may afford a particular action, lead to an anticipated result, and, in hindsight, may be called true. However, none of this implies that the sentence "mirrors" the world in itself. Sentences are as much "for us" as they are "for the world." Theories enable us to coordinate our actions in relation to nature, and they may be effective or ineffective, but they are not mirrors of nature.

Rorty (1998, p. 48) vividly conveys the pragmatist argument by arguing that theories have "no more of a representational relation to an intrinsic nature of things than does the anteater's snout." The anteater's snout is an adaptation to its environment, which mediates between the anteater's desire for ants and the existence of ants in hard-to-reach places. The snout may be effective, but this does not make it a mirror of ants in hard-to-reach places. Equally, human knowledge of horticulture is not a mirror of the timeless Truth of plants; it is a purpose-driven mediator between the human desire for food and the world. Horticulture is evaluated not by whether it "mirrors" Reality but by whether it successfully enables humans to grow food.

The metaphor of theory as a mirror of nature permeates our thinking. It is latent in Plato's allegory of the cave (see Chapter 1), with the Ideal Forms casting pale shadows upon the wall. It is evident in the etymological root of "representation" in "showing" and everyday phrases such as "in the mind," and talk of beliefs "corresponding" to reality. It is also used in arguments: In contrast to one's own "objective" facts, other people have "beliefs" and "opinions" with a dubious correspondence to reality.

The mirror metaphor is useful if one wants a simple way to talk about false beliefs. However, it also creates problems, or anomalies. First, it elevates correspondence as the main criteria of evaluation, downplaying the criteria of both usefulness and ethics. In this sense, it disconnects theories from human values (Putnam, 1995). Thus, research ethics focuses on data collection but is mute on what the research is for, whom it benefits, and whom it might exploit (e.g., research on advertising to children, or microtargeted advertising). Second, it frames the researcher as a detached observer, naïvely suppressing the role of the researcher in creating theory.

It obscures the fact that theories are for humans. For example, it cannot explain why metaphors permeate all theories. Third, it separates the theory from nature, failing to conceptualize how theories are part of the social world and can have real consequences. This creates a problem for how to deal with theories that are true but of potentially unethical consequences (e.g., torture; Bohannon, 2015). So, what metaphor does pragmatism suggest?

3.3.2 *Theory: A Tool, Map, and Model*

The trail of the human serpent is throughout the social sciences, evident in the bricolage of quintessentially human metaphors used. This stubborn fact makes realists recoil and relativists give up. However, pragmatists are unfazed. Pragmatism advocates becoming critical evaluators of the metaphors we choose to use. Do they serve our purposes? Do they empower? Or do they create unethical outcomes or ineffectual surprises?

From a pragmatist standpoint, theories are tools that enable people to grow food, fly planes, and create artificial intelligence. There is a tendency to think of tools as merely serving practical purposes, but, arguably, some of the most powerful tools enable us to act on ourselves (e.g., extending memory, transmitting experience, and empowering social coordination). Our cognitive capacity is boosted by writing, typing, and searching (Gillespie et al., 2012). Our identity is transformed by mirrors, photographs, and social media (Gillespie et al., 2017). Our ability to coordinate is empowered by calendars, to-do lists, and communication devices (Aldewereld et al., 2016). Moreover, the trajectory of society is shaped by our social technologies for collectively imagining a future together (Jovchelovitch & Hawlina, 2018; Wright, 2010; Zittoun & Gillespie, 2015). But, in science, theories have a narrower function: They empower the mind, direct our attention to specific issues, and guide our actions through the many branching paths within a dataset.

> Effects are produced by the means of instruments and aids, which the understanding requires no less than the hand; and as instruments either promote or regulate the motion of the hand, so those that are applied to the mind prompt or protect the understanding. (Bacon, 1620, p. 345)

Scientific knowledge creates theories that empower human thought and action. Theories, in this sense, are simply part of the scientists' toolkit. Lewin (1943, p. 118) describes theory "as a tool for human beings." Similarly, Mead (1936, p. 351) writes: "[W]hen we speak of a scientist's

apparatus we are thinking of the very ideas of which he can make use." Just like the scientist's apparatus, the scientist's theory mediates interaction with nature. In the same way that we cannot say that a scientist's apparatus "mirrors" nature, we should not think of theories as "mirrors" of nature but rather as tools for interacting with nature – like the anteaters' snout.

Tools, however, come in many varieties: What type of tool is a theory? Arguably, theories are like maps. Maps are tools for getting us from one location to another. Theories are tools for getting us from one situation to another, from the present to a desired future. Theories are like maps because they both synthesize many observations, make past experiences accessible to a broader audience, enable human activity, require training to use effectively, and are necessarily incomplete. A perfect map would be as detailed as the terrain and thus useless (see Borges' short story, "On exactitude in science"; 1999). Theories, like maps, simplify to focus attention on a given purpose (Midgley, 2003). There are geological, political, and deprivation maps of the same region, and we do not ask which is the "True" map: "[W]e know that the political world is not a different world from the climatological one, that it is the same world seen from a different angle" (Midgley, 2003, p. 27). Both theories and maps are created by human choices, with trade-offs between accuracy, parsimony, and usability (Toulmin, 1973). Equally, each theory has been created for particular purposes and thus reveals the world from a particular (potentially useful but always incomplete) angle.

Theories are also like maps because, in the face of uncertainty, it is prudent to have multiple, even contradictory, maps. Explorers lost in an unfamiliar land may have several incompatible mental maps of the area. They do not decide which map is infallible and discard the rest.

> Instead, they had better bear them all in mind, looking out for whatever may be useful in all of them. In the field, they can eventually test one suggestion against another, but it need not always turn out that either suggestion is wrong. The river that different earlier maps show in different places may actually be several different rivers. Reality is always turning out to be a great deal more complex than people expect. (Midgley, 2003, p. 27)

All maps are imperfect, made at different times (when the rivers were full or dry) and for different purposes (for navigating by land or sea), and are always deployed in a future context that is necessarily somewhat novel. Equally, theories aim to extend past experiences into partially uncertain futures. And rather than choosing the timelessly True theory and discarding the rest, it is more prudent to view theories as a collection of resources

that may or may not be useful (or true with a small "t") in particular contexts, depending on the problems that arise.

One limitation of the map metaphor is that maps do not respond to our actions; but the world (especially the social world) is, in part, shaped by our actions, which, in turn, are shaped by our theories. We do not simply move through the social world; we contribute to it and, in some small way, shape it. Although theories may provide a map of the social world, the social world is changed by the existence of these maps. There is a looping effect, whereby our descriptions of social phenomena feed forward into the phenomena (Hacking, 1995). For example, the representation of autism changes the consequences of having autism (Heasman & Gillespie, 2017), and simply naming and explaining techniques of persuasion can undermine their efficacy (Gillespie, 2020a). This looping means that theories in social science usually lag behind the future they encounter, because the future encountered can, in part, be a response to the theory.

Another tool metaphor, related to maps, that better captures this looping effect is that theories are "models." Consider an architect's model of a building. Advanced digital models of buildings can simulate the flow of people through an office, the traffic over a bridge, and the effects of wind on a skyscraper. They support architects in imagining the consequences of design choices (e.g., adding a stairwell, reinforcing a span, or substituting materials). The model is not a mirror of the truth of the unbuilt building; rather, it is a dynamic exploration of what the building could be that will feed forward into what the building becomes.

Conceptualizing theory as models that support future-oriented action is consistent with a simulation approach to cognition (Gallese & Goldman, 1998). The idea is that our minds are structured not in terms of formal propositions but in terms of rich embodied simulations. For example, when we think of a bike, we activate the neural circuits for riding a bike – the muscles for balancing, peddling, and steering. This idea that concepts, even abstract concepts, entail mental simulation goes back to phenomenology (Merleau-Ponty, 1945), but now it is backed up by brain study research. For example, the same areas of the human brain are activated in response to the word "pain" as are activated in the direct perception of pain (Lamm et al., 2011). Equally, when we try to understand other people's minds, we do so by simulating, or creating a model of, how we would feel if we were in their situation (Schilbach et al., 2013; Vogeley, 2017). Thus, there is growing evidence that theories might be like simulations – mental models, or maps, for rehearsing, and speculating about, possible interactions with the world.

The idea that social science theories are simulations has some beneficial consequences. It draws attention to how theories enable us to think through if-then scenarios. These models can develop through embodied ethnographic experience or experimental interventions. But the outcome is the same: an intersubjectively shared simulation, or a shared mental model (Van den Bossche et al., 2011), of what will happen and could happen under various circumstances. These models are not timeless mirrors of the world; rather, they are dynamic simulations with multiple possible futures. They enable playing with scenarios, evaluating possible interventions, and guiding consequential actions that will change the course of events. Indeed, the purpose of such models is not to predict what will be but rather to enable people to shape what will be. The model that central banks have of inflation will shape our future inflation; the taxation model that politicians have will shape our future finances; and the model of mental illness that a therapist has will shape his or her intervention. In short, rather than "mirroring" the world (an infinite, directionless, and futile task), models guide humans in "making" the world.

Sometimes a model's main purpose is to avoid a predicted outcome. For example, models of the impact of past, present, and future human activity on global warming are both descriptions of and interventions in human behavior. One hopes, possibly naïvely, that the catastrophic consequences predicted do not materialize because the predictions motivate humans to take corrective action. If global warming is halted, it will not mean that the predictions were false; rather, it will mean that the models successfully altered our actions. In 2020, during the early stages of the Covid pandemic, models of predicted infection and mortality rates led many governments to institute lockdowns, avoiding the worst predicted outcomes. Does this mean that the predictions were wrong? No. It means that in social science, our knowledge does not mirror the future; instead, it contributes to the future (Hacking, 1995). In short, theories are tools, or supports, for human activity.

The metaphor of theory as a model to guide activity is particularly evident in statistical modeling. Driven by the increasing quantities of data available, there is a corresponding increase in the scale and ambition of statistical modeling. This ranges from modeling big datasets to agent-based simulations (Helbing, 2012). Naïve realism embraces these models as Plato's Ideal Forms, revealing the underlying Truth of which all data are a pale reflection. Relativism dismisses these models as one of many alternatives, each with associated histories and interests. In contrast, pragmatism views these models as more or less useful tools for acting, coordinating,

and navigating an uncertain future. "Good" models are thus empowering, enabling us to take responsibility and ensuring that our individual and collective actions are effective and ethical with as few unintended consequences as possible.

3.3.3 Theory Development and Disruptive Data

Theories, from a pragmatist standpoint, develop through encountering disruptive data. Theories synthesize past experiences into expectations for the future, which are often thwarted. Theory development begins in this moment of disruption when action fails.

Consider the example of the door that won't open from Chapter 1. As one approaches, the embodied expectation is that the door will effortlessly open inward to reveal the hallway. However, although the door handle obliges, the door does not. The disruption stimulates the mind to revise the expectation; maybe the door opens outward? But pushing does not work. Double-checking, one alternates between pulling and pushing. Ineffective repetition of this sequence gives way to a deeper reflection: Can the handle go down further? Can the handle be raised? Is the door jammed? Is the door locked? Is there a key? Is there a release button? Is there a knob lock or a deadbolt? Is the latch bolt moving? Is this really a door? Is there a second door? Interspersed are tangential thoughts: What if there is a fire? Where is the bathroom? Is someone playing a practical joke? Expectation has been disrupted; the mind is alive in the reconstructive effort. The stream of thought attempts to revise the map, or schema, on how to exit the room. The initial guidance failed, and a new path of action is needed. The stream of thought alternates between multiple possibilities, but what cannot be ignored is the stubborn fact that the door will not open.

The scientific literature shapes researchers' expectations for research. When these expectations fail, when there is an anomaly, there is the opportunity for a contribution. However, unlike the example of the jammed door, scientific action is rarely definitively blocked. Disruptive results do not stop one from having lunch, and they can always be abandoned in a bottom drawer (Earp & Trafimow, 2015). In most domains, disruptive facts are not as disruptive as a door that will not open or a car that will not start. In most cases, disruptive facts can be circumvented, deferred, or glossed over. This is a problem for science. Good science, with genuine advances, embraces disruptive facts, listens to them, and learns from them.

Scientific revolutions often begin with overlooked disruptive facts. A paradigm shift, Kuhn (1962, pp. 52–53) writes, "commences with the

awareness of anomaly, i.e., with the recognition that nature has somehow violated the paradigm-induced expectations." The defining feature of the anomaly is that it resists explanation in terms of existing theory; instead, it challenges existing theory. In Piaget's (1977) terminology, it requires accommodation, that is, that one's assumptions and expectations need to change in order to accommodate the disruptive fact. Or, in Bateson's (1972) terminology, it requires double-loop learning. In any case, as the new paradigm, or worldview, begins to form, it gives researchers a new conceptual standpoint from which additional anomalies become visible.

Scientific progress is facilitated by embracing anomalies, reminding oneself that all expectations are fallible, and engaging earnestly with alternative theories. This does not mean that all theories are equal; some explain the anomalies better than others. What it means is a continuously inquisitive attitude. "Scientific advance," Mead (1917, p. 178) writes, "implies a willingness to remain on terms of tolerant acceptance of the reality of what cannot be stated in the accepted doctrine of the time, but what must be stated in the form of contradiction with these accepted doctrines."

We distinguish between data in general and disruptive data (what Mead and Peirce termed "facts"). Data are an accumulation of observations in the past that are synthesized, recombined, and extrapolated into guides for the future (Peirce, 1955). Disruptive data are the subset of data that do not conform to expectations – obstinate observations that challenge accepted doctrines. Scientists should appreciate and cultivate disruptive data because they are the seeds of theoretical advances. Disruptive data arise when our interactions with the world break down, reminding us, yet again, that the world is subtler, more abundant, and more intricate than any theory (Feyerabend, 2001). Disruptive data demarcate the limits of current theory and spur future theory to be more useful and yield fewer surprises.

The distinction mirrors Bateson's (1972, p. 453) definition of information as "a difference which makes a difference." Bateson builds on Kant's observation that there are an infinite number of facts about a single piece of chalk: Each molecule within the chalk is different from every other molecule, and the position of each molecule relative to every other molecule could be calculated as differences; and when complete, one could start calculating the position of each molecule relative to every molecule in the universe. These are but a tiny subset of the infinite facts about the chalk. However, despite the veracity of each datum, the net result is not informative. In our terminology, all these measures provide much data but, we expect, little disruption. That is because genuine information, in

a pragmatist sense, is not just a difference (i.e., a measure) but a difference that makes a difference (i.e., is of consequence for a theory or practice). The value of empirical data is not merely in the accumulation of measurements, it is also in the disruptive pushback against expectation. As Deacon (2011, p. 384) argues: "[I]f there is no deviation from expectation, there is no information." That is to say, valuable information, the "gold" within mere data, is disruptive data consequential for theory and practice.

Disruptive data arise within a web of taken-for-granted expectations. "No actual problem [disruptive fact] could conceivably take on the form of a conflict involving the whole world of meaning" (Mead, 1917, p. 219), because theoretical work entails integrating the disruptive fact back into the broader taken-for-granted meanings. Science is a method for world reconstruction, for patching up and repairing the ship of knowledge – while at sea. Science resolves localized problems by aligning them with the bricolage of taken-for-granted meaning. Theories created at time one are taken for granted at time two and potentially problematized at time three. Science is a nonfoundational procedure for finding, interpreting, and accommodating disruptive facts.

It is important not to separate models and disruptive facts completely. An overharsh separation would fall back to a mirror theory of nature, whether the model "mirrors" the facts. For pragmatism, all data are connected to theory (e.g., data are disruptive or not only from the standpoint of a theory) and all scientific theories are connected to data (e.g., the history of their adaptation to disruptive facts). There is a continuum from data (observations, correlations) through definitions and classifications to theory (models, propositions) that is better described in terms of degrees of conceptualization and cognitive processing (Abend, 2008; Alexander, 1982). Specifically, disruptive data, or anomalies, are not self-evident; they require interpretation for their significance to be realized. This is why anomalies often become evident only from the standpoint of a novel emerging paradigm (Kuhn, 1962). Not only do anomalies create new theories, new theories make visible overlooked anomalies.

3.4 Illustration: Theory in Creativity Research

The field of creativity research illustrates realist, relativist, and pragmatist approaches to theory. This field has seen dramatic paradigm shifts, with diverse theories of creativity proposed. It is thus a useful domain to illustrate how pragmatism shifts the question from "which theory is right?" to "what does each theory enable us to do?"

The dominant approach in creativity research is realism, which assumes that creativity is an objective quality of people, objects, or ideas that has an acontextual presence and that researchers can objectively measure this quality. This approach focuses on discovering the causes, correlates, and consequences of creative expression by measuring creativity and examining its causes and consequences (Runco, 2010). The interest here is to reach empirically based, universally valid, and generalizable theories of creativity. The researcher and the research aims are bracketed aside; the focus is on creativity in itself.

Since the 1980s, constructionism has provided an alternative approach. The constructionists argue that creativity cannot be evaluated objectively but necessarily resides "in the eye of the beholder." In the extreme, nothing binds together the artifacts labeled creative, except social agreement and cultural convention. This approach focuses on the variability of what is viewed as creative across time and place. Nothing can be called "creative" in absolute terms except with reference to some point of view, or audience. For example, Csikszentmihalyi (1990) theorized how gatekeepers (e.g., publishers, curators, and art critics) determined what was and was not creative. From a realist standpoint, this systemic approach resembles relativism, and it is challenging to operationalize rigorously.

From a pragmatist standpoint, focusing either on the pure qualities of creativity or on the cultural judgment of what is creative misses the self-evident point that creativity is always enacted (Glăveanu, 2020b). In human action the subjective (interests, motives, belief) and the objective (materiality, situation, context) interact. More than most actions, creative actions are consequential, are future-making, and can leave a long-lasting mark on individuals, groups, and society. Thus, the pragmatist approach directs researchers' attention to the creative act and its consequences: How is creativity done? What are the heuristics? What are the consequences? How can it be supported?

At the level of research, pragmatism directs attention toward what theories and metaphors of creativity have enabled. Glăveanu (2010) has identified three cross-cutting paradigms in the field, each anchored in a different root metaphor: the He-paradigm, the I-paradigm, and the We-paradigm.

The He-paradigm labels highly visible creators and creations as revolutionary and seeks to understand them. This can inspire some people to develop their potential to the fullest, but it can also disempower the majority – if geniuses are the only "real" creators, then most people's actions are generic reflections of authentic creative power. The I-paradigm democratizes creativity by emphasizing that everyone and everyday activities can be creative. This paradigm encourages everyone to cultivate their

creative potential. Yet this potential remains rooted within the person; this means that, should someone fail to achieve creative success, they have only themselves to blame. Finally, the We-paradigm radically reconceptualizes agency and change. These are no longer underpinned solely by personal abilities; they are embedded within society and shaped through joint action. The We-paradigm makes us aware that society is malleable and can be transformed only through coordinated creative action.

How should we evaluate these three paradigms? For the realists the sequence of paradigms is the march of progress. For the constructionists the shifting paradigms is further evidence of the absence of a timeless Truth. For the pragmatist the truth of the paradigms is in their consequences. Each paradigm has generated different paths of action. The He-paradigm is useful if one wants to train geniuses. The I-paradigm is useful for bolstering individual creativity. The We-paradigm is useful for fostering society-wide creativity. There is not one infallible true paradigm lurking within these three options; rather, they provide different maps for getting to different destinations.

Creativity research also illustrates disruptive data. One long-standing debate has been whether people are more creative alone or in groups. Many experiments have been conducted showing that people produce more ideas when alone than when in groups (DeRosa et al., 2007; Mullen et al., 1991). However, there is a disruptive fact: There are countless naturalistic observations of people being creative together (e.g., famous bands, scientist teams, comedy groups, and art collectives). One attempt to reconcile these disruptive observations is the idea that ideas produced alone and in groups have a different quality. Specifically, Glăveanu and colleagues (2019) showed that ideas produced in groups are more communicable and practical, while ideas produced by individuals are more idiosyncratic. In this case, the disruptive observation, the anomaly, creates a tension that can easily be overlooked (i.e., experimentalists ignoring creativity practitioners and vice versa). But exploring the tension prompts the abductive insight that creativity is not simply "more" or "less" but also different in type (i.e., peculiar vs. communicable). Thus, the question shifts toward how different social configurations shape not the quantity but the content of creative outputs.

3.5 The Consequences of a Pragmatist Approach to Theory

Pragmatism evaluates theories in terms of their consequences. Accordingly, what are the consequences of conceptualizing theory as a tool or a map? Does this pragmatist approach to theory add any value?

First, a pragmatist approach to theory enables critical evaluation of the interests served by a theory without becoming relativist. Theories, as sociohistorical tools, are always born of a context and always answer to some human interests (see Chapter 8). No theory is completely neutral or detached, and some theories clearly privilege some groups over others. This does not, however, mean that all theory is equally and irreducibly biased. Some theories are useful for obtaining publications, grants, and tenure. Other theories are used by corporations to increase engagement, market share, and sales. Yet other theories are distributed freely, for example, to empower people in daily life (e.g., principles for decision-making, cooking heuristics), to enable parents to raise their children (e.g., techniques to help babies sleep, to encourage exploration), to help people to cope with illness (e.g., support groups, assistive technologies), and to improve social coordination (e.g., wikis, *Roberts Rules of Order*). A critical analysis of the interests being served by theory does not imply relativism. Indeed, it is precisely because theories are consequential for daily living that critique is necessary. Moreover, these same consequences are the nonrelativist fact that enables a pragmatist critique to analyze who benefits from a given theory.

Second, a pragmatist approach to theory sensitizes researchers to the emergence of new problems and anomalies. Theories, despite being potentially useful, are grounded in peculiar social and historical contexts. Contexts change, old problems cease to be relevant, and new problems arise. Each year brings new social problems for social science to address (e.g., the Covid pandemic, the cost-of-living crisis, generative artificial intelligence, and remote working). A pragmatist approach to theory expects these shifting contexts and problems to lead to revisions and replacements of theory. Pragmatism never complacently assumes that Reality has been unveiled; instead, it keeps researchers alert to the need to adapt theory to emerging problems and contexts. Moreover, it sensitizes researchers to anomalies. By not reifying theory (i.e., confusing our theories with the phenomena they describe), it keeps our critical faculties alive to the potential for anomalies. A pragmatist approach to theory is not threatened by anomalies, edge cases, and disruptive data; it tolerates them and sees in them the seed of scientific progress.

Third, a pragmatist approach focuses attention on the usability of theory. Concealing the role of humans in constructing theories, trying to pass theories off as mirrors of nature, overlooks the importance of making theories communicable and accessible to a wide range of potential users (Cornish, 2020). Theory-building in social research is usually

object-facing: sampling, measurement design, validity tests, and so on. Conceptualizing theory as a tool reminds us that there is also a subject-facing side to theory. A hammer has both a head (orienting to the object, or nail) and a handle (orienting to the subject, or user). The user-facing side of theory, the handle of the hammer, pushes toward theories that are parsimonious, memorable, and accessible to a wide range of people. Communicable and accessible theories benefit social science because they enable researchers to integrate theories from diverse domains. But, more significantly, it reconnects social science with laypeople. As discussed earlier, Kant's bit of chalk has an infinite number of truths, but most of them are not worth studying. "Truth" and "rigor" cannot be the only criteria for social science – there are an infinite set of useless truths that can be rigorously studied. If social science wants to have an impact and be part of social life, it needs to enshrine usefulness as a criterion for selecting and pursuing research questions.

Fourth, a pragmatist approach argues against null hypothesis testing and favors model-building. The metaphor of the mirror of nature dovetails with null hypothesis testing. One creates a falsifiable hypothesis to do a one-shot test about the correspondence between the theory and observations. The focus is on the probability that the observations could have occurred if the hypothesis was incorrect. Null hypothesis testing has been the subject of much recent critique because it puts too much emphasis on a true/false binary decision, which is open to many distortions (Masson, 2011; Trafimow, 2022). The alternative is to shift toward model-building. Instead of testing hypotheses about the world, one tries to build a model to describe the cumulating data on a phenomenon. This approach usually results in the construction of several models of the data, models that may even be logically incompatible. These models are evaluated not in terms of being true/false but in terms of the degree of fit with existing data, new data, and their overall utility.

Fifth, a pragmatist approach to theory reveals there can be no end to theorizing. With the advent of big data, it has been argued that the end of theory is near (Anderson, 2008). The idea is that with enough data, computers will create models based on incomprehensible volumes of data, making our attempts to theorize with limited data obsolete. Theory, it is argued, will be replaced by brute prediction based on ever-growing datasets. There is little doubt that these models will be powerful. Humans, at a group level and over time, are quite predictable. But in what sense will these models contribute to human understanding? Or might they just empower some at the expense of others? Big data models will challenge

our definitions of theory and understanding (Boyd & Crawford, 2012). Does a prediction, created by an algorithm, constitute understanding? No. Theory is not just for prediction – that is only a narrow technocratic interest. Theories are also for providing insight and empowering human activity (see Chapter 9). Understanding must be "for humans." Human understanding requires vivid metaphors and mental simulations anchored in the taken-for-granted activities of daily life.

Finally, because social theories do not merely describe the world but are also part of the world (having social consequences), research is necessarily entwined in ethics (see Chapter 8). From a pragmatist standpoint, it is artificial to separate knowledge from values (Brinkmann, 2010, 2013; Putnam, 1995). Theory enables acting on the world, on others, and on one oneself (e.g., predicting, nudging, influencing, rewarding, judging). To create a social science theory that is ethical, Cornish (2020) advocates the acid test of being able to present the theory to the people on the receiving end of it and to ensure that they do not feel undermined, objectified, or otherwise disempowered by the theory. One way to ensure that theories orient to a broad range of interests is to ensure broad participation in the creation and/or evaluation of the theory. Indeed, because theories of social behavior do not "mirror" the world and instead are enabling/disabling tools in the world, they are more likely to be successful if they have buy-in from those impacted by them.

3.6 Impoverishing versus Enriching Theory

All theories are incomplete. Theorizing any phenomenon necessarily entails simplification. The world is infinitely rich; from the macroscopic to the microscopic, from the natural world to the human domain, there is fractal complexity (Abbott, 2000; Kauffman, 1996). Theory entails a "conquest of abundance" (Feyerabend, 2001), namely, pressing the infinite richness of the world through the procrustean bed of human understanding. Chairs are talked about in general terms, but there is no such chair; each chair is particular. Eggs are interchangeable and come in boxes of six, but each egg is unique. Each falling rock and gathering crowd is unique. Theories, from gravity to crowd psychology, are conceptualized in ideal terms, but the ideal is a nonexistent simplification. Privileging abstract simplifications over the social world's blooming complexity is impoverishing. Pragmatism is enriching because it embraces particularity, contextualism, and open-endedness.

From a realist standpoint, the incompleteness and impoverishment of theories vis-à-vis the abundance of human experience is a disheartening

anomaly. However, from a pragmatist standpoint, this is unproblematic because theories (like words and numbers) are not meant to "mirror" nature; rather, they are tools for human action. Perfect correspondence between our models and the world would entail models as rich, abundant, and complex as the world itself, providing no aid to human action. Models enable human action precisely because they simplify. Words, numbers, and theories abstract regularities in our interactions with the world, providing a necessarily imperfect but an increasingly good enough model for guiding humans by taming, to some extent, the uncertainties of the future.

Although theories simplify the world in terms of description, they enrich it in terms of practice. Rejecting the separation between description (words, numbers, theories) and the world, between the map and the terrain, pragmatism conceptualizes the theory as a new growth within the terrain. Good theories genuinely create new possibilities within the world. "May not our descriptions," James (1907, p. 256) writes, "be themselves important additions to reality?" The key insight is that theories "loop" back into the world, are part of the world, and change the world (Hacking, 1995). Theories in natural science rarely change the phenomena they describe, but they do change the world by enabling, for example, nuclear reactions. Theories in the social sciences have the added potential to interact with the phenomena they describe, such as when people are made aware of a particular bias and thus alter their behavior (Nasie et al., 2014).

To conceptualize social research as the mere pursuit of Truth is impoverishing because it fails to appreciate the role of social research in contributing to the truths of tomorrow (Gergen, 1973, 2015). Stimulus–response theories created institutions based on reward and punishment. Utility maximizing theories appeal to and cultivate self-interest. Theories that emphasize our limited capacity processing support the techniques of nudging. Theories that focus on collaborative creativity yield new techniques for working together. Each of these theories have been used to create institutions and practices within which lives are lived. Do these theories make the most of human potential? Are we making theories that enable people to help each other, show gratitude, build social connections, and find meaning in life? A pragmatist approach requires taking responsibility for the theories we create (see Chapters 8 and 9). "The world," James (1907, p. 257) writes, "stands really malleable, waiting to receive its final touches at our hands." Thus, a pragmatist approach to social research shifts the question away from what people and society *are* and toward what they could become.