Inchoate Situations and Extra-Rational Behavior

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> "What will the situation be like in twenty years? Maybe somebody will come along with a more general and powerful theory, which includes rational choice as a special case, and that will have different behavioral implications in some of these intractable areas. I am open-minded about this." Gary Becker, Nobel Laureate in Economics in Swedberg (1990, p. 40)

Social scientists, particularly sociologists and economists, have battled for decades about whether people are rational and what it might mean for people to be rational. In this paper, I take a different approach. Specifically, I argue that for an actor or actors, there are situations where the conditions for rationality, in the strict sense meant by economists, are not met. In such situations, they cannot act rationally, even if people are capable of acting and do act rationally otherwise. Thus, it is the situation, not solely individual psychology, that determines whether individuals act rationally. It is the structure of the situation that makes rationality impossible. I term such situations inchoate. The question then is how do people act in inchoate situations. How do they act *extra-rationally*.[1]

There is a large literature under the heading of "bounded rationality" that has considered situations in which individuals are likely to not act rationally in the strict sense meant by economists—that they do not make the choice that is optimal given their preferences and the constraints they face. In adopting the phrase "bounded rationality," Simon was not pointing to any particular phenomena. Rather, his purpose was to indicate that much of human behavior was not rational in the economist's sense. To quote Simon:

> I have never thought of either bounded rationality or satisficing as precisely defined technical terms but rather as signals to economists that they needed to pay attention to

[1] "Extra" is used here in the same way it is used to modify "terrestrial," as in "extraterrestrial," meaning beyond "terrestrial." By "extra-rational," I do not mean "superrational."

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H. Staubmann, V. Lidz (eds.), *Rationality in the Social Sciences*,
DOI 10.1007/978-3-319-62377-1_16

the reality and a suggestion of some ways in which they might. (Letter to Gerd Gigerenzer reprinted in Gigerenzer 2008, p. 91. Also see interview of Simon at: https://www.youtube.com/watch?v=ErnWbP_Wztk.)

Although the initial literature on bounded rationality considered many types of non-maximizing behavior, in recent years, bounded rationality has come to be associated with System I or fast, generally unconscious, thinking in dual processing models with rationality representing System II or slow thinking (Kahneman 2011). Kahneman did this most explicitly and influentially in his Nobel Prize lecture (Kahneman 2002, also see Kahneman 2003). In sociology, the importance of fast or similarly habitual thinking is often connected to Bourdieu's work (1977) and his analysis of habitual behavior, among others. Also see Gross (2009).[2]

A strong critic of the narrow identification of bounded rationality with System I thinking is the German psychologist Gerd Gigerenzer. In a series of books and papers (e.g., Gigerenzer 2000, 2008; Gigerenzer and Selten 1999; Gigerenzer et al. 1999, 2011), he has argued for the importance of heuristics in human decision-making. In overly simple terms, Gigerenzer contends that humans confront problems in novel situations and then develop simple rules for solving those problems that are then applied in the future in similar situations.

In this paper, I point to a different type of behavior that I call extra-rational behavior that is also not rational in the economist's sense but is quite different from Kahneman's System I thinking or Gigerenzer's heuristics. Specifically, I focus on situations where rationality is not possible because what is optimal is not known or defined. These are situations I label inchoate. Thus, the fact that a situation is inchoate prevents individuals from being rational, not, as often argued, solely individual psychology.

It is important to appreciate that I am not claiming that rational choice theory is wrong. The paper instead is motivated by the fact that there are manifold situations in which the conditions necessary for rational action do not hold and yet people act nonetheless. If, as sociologists, we are concerned primarily with explaining action, an alternative theory is needed to explain action where rational choice does not apply and how people act in such situations.

My position is similar to that of Whitford (2002, p. 325), who argues that "rational choice theory does not deserve paradigmatic privilege," implying that in studying any situation, one should not simply assume that rational choice theory is the appropriate model for analysis. Thus, in studying specific situations, rational choice theory may be quite useful, but this does not imply, by any means, that it is appropriate for the study of all situations (Whitford 2002).

In important respects, my argument also resembles that of Weick (2001) who is interested in situations that "lack sense." Although I consider our respective theories to be complementary, mine is more precise and more general. First, I delineate specifically why rational action is not possible in a particular situation—the failure

[2]Long before Bourdieu, Dewey examined the importance of habits as a mode of behavior (Dewey 1939). For a more extended discussion, see Gross (2009).

of one or more of Gintis's necessary conditions for rationality, what he calls his beliefs, preferences, and constraints or BPC model. Second, I examine the wide array of strategies—in addition to Weick's "sense making"—that are potentially available to individuals in such situations.

In developing my approach, I draw from pragmatist thinking, particularly that of John Dewey.[3] As Whitford (2002) discusses in detail, in a Deweyian and more generally pragmatist account, ends are situation specific, discoverable, and revisable. As such, ends are endogenous and require explanation. A theory of action is much less about simply choosing between a set of options as is fundamental to rational choice theory but is rather about understanding how ends and means (options) are discovered and acted upon in a particular situation. As such, individual behavior can be intentional without being rational in the economist's sense of the term. I discuss this in more detail below.

One goal of this paper is to prevent Simon's notion of bounded rationality from being narrowly defined, as Kahneman's does, simply as System I thinking. Rather, I suggest that individuals can be nonrational in multiple ways. As such, I argue that there are multiple modes of individual thought, not just the economist model of rationality or the psychologist's System I and System II thinking [for a review of different dual processing models in psychology, see Evans (2008)].

To make my argument, I first consider a canonical example of extra-rational behavior—a jigsaw puzzle where neither the form nor the content of the completed puzzle is known. Besides providing an extended illustration of what I mean by extra-rationality, the example demonstrates that behavior can be intentional without being rational. I then propose a rough typology consisting of three types of behavior—rational, subrational (Kahneman's System I), and extra-rational. In a subsequent section, I consider Gintis's beliefs, preferences, and constraints (BPC) model as a way to delineate the conditions needed for rationality in the economist's sense, a second goal of the paper. I then consider situations where one or more of his three conditions are not met. Specifically in terms of his BPC model, I consider where for the individual there is (**B**) incomprehensibility, one's **beliefs** are insufficient to understand one's options; (**P**) incommensurability, one's options are known but can't be compared, that is, one's **preferences** are ill-defined; or (**C**) unspecified attainability, one's options are known but the **constraints** on choosing or acting upon them are unknown. Failure of one or more of Gintis's conditions in his BPC model leads to what I call an **inchoate situation**, inchoate in the sense that the situation is not fully formed or structured. As stated above, my question then is how do individuals behave in inchoate situations, that is, what is the nature of extra-rational behavior?

The central portion of the paper follows and addresses two questions: (1) What are common examples of inchoate situations? (2) What strategies do people use to deal with such situations? Having discussed examples of inchoate situations and

[3] Muller and Winship (2010) discuss Dewey's theory of action in more detail. Joas' *The Creativity of Action* (1996) provides the most thorough analysis (see also Whitford 2002; Stark 2009). AU1

strategies used to navigate them, I discuss another canonical example, that of work and the transition to adulthood pointing out that for some individuals, the transition is automatic, e.g., one does what one's parents did; for others, it is highly strategic, e.g., one enters an apprenticeship in order to enter a guild; and finally for still others, it is a process of discovering what one wants to do and what options one has.

Arguing from a pragmatist perspective, I conclude that what we need is not a single theory of action as advocated by Gintis and others but rather a comprehensive set of *theories* of action. My classification of action into the rational, subrational, and extra-rational constitutes a preliminary effort to do this.

Intentionality Without Rationality: The Jigsaw Puzzle

To establish what I mean by extra-rational behavior and demonstrate when behavior can be intentional without being rational, consider a jigsaw puzzle.

The picture (Fig. 1) depicts what appears to be a very difficult jigsaw puzzle. Make it even harder. First, assume that we have lost the box cover for the puzzle so that we don't have any idea what the picture will look like when it is fully assembled. In fact, we have no reason to even know what shape the final form will be: a rectangle, a circle, a trapezoid, or some highly irregular shape. Second,

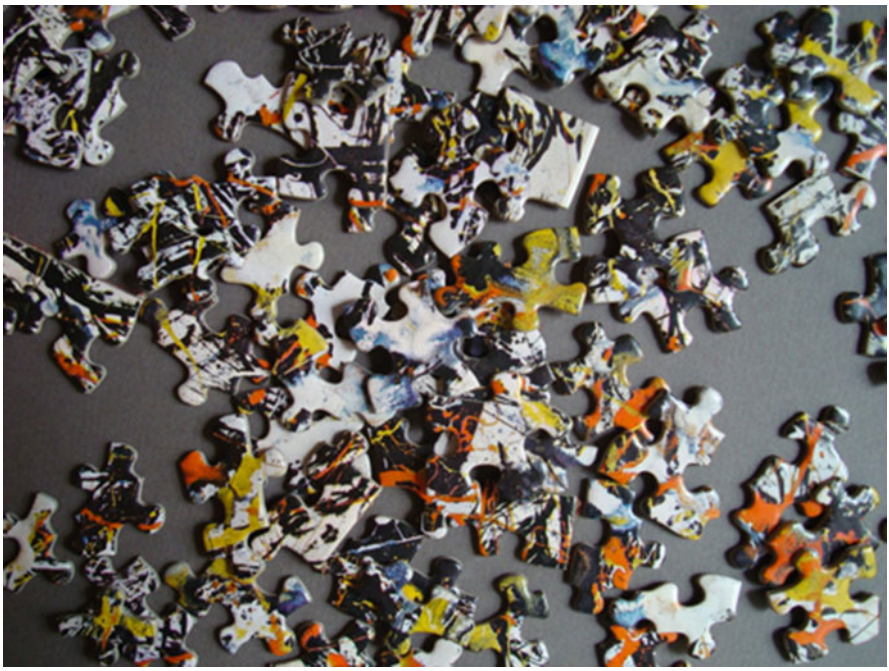

Fig. 1 Jigsaw puzzle (Photograph by Kim Piotrowski; http://www.kimpiotrowski.net/)

assume that it is possible that some pieces are missing and other pieces are extraneous, i.e., they come from other puzzles. Finally, assume that it may be the case that pieces do not uniquely go together and in fact there may be more than one way to complete subcomponents of the puzzle and perhaps the whole puzzle itself.

What I want to suggest is that human action, at least some if not much of the time, is similar to putting a jigsaw puzzle like that above together. In his 2009 book, *The Sense of Dissonance*, David Stark quotes a web designer who describes his work in exactly this way.

> No matter how many new changes come across, for every new change, you can tie up and get your arms around, get a resolution to, and get it implemented; then that actually serves to be a greater step toward the realization than just figuring out how the two pieces you had in the beginning fit together the way that you thought they would, because it's now more like you're getting these undefined pieces and you're able to define them, and that sort of leapfrogs you toward that realization. At some point when you get all of those changes done and a good portion of the rest of it done and at that point, that's usually when I have that realization that Yes! I see what it is that we're doing now. I have a good understanding of the whole thing and what it's going to end up looking like. For me, it usually happens toward the end (Web-designer. Quoted in David Stark, *The Sense of Dissonance*, 2009. p. 100).

Our jigsaw puzzle and situations analogous to it have three important properties. First, the goal is highly general. There is intentional behavior. We want to put the puzzle together. We are not sure what it will look like when finished; we may or may not know when it is complete. Second, there is no obvious (optimal) best strategy. We could hypothesize that the final puzzle forms a rectangle and sort out all the straight pieces. Of course, if the final picture is a circle, this would be a highly unproductive strategy. We might assume that the puzzle contains a picture of the sky and sort all the blue pieces together. Of course, if the puzzle does not have a sky, as is true of the puzzle above, which is a Jackson Pollock painting, this would also be very nonproductive. A third strategy might be to pick a piece at random and see what other pieces fit it. However, if this piece doesn't actually belong to the puzzle, this strategy will be fruitless. There are certainly other possible strategies.[4]

The problem is that because we do not understand *specifically* what we are trying to do, it is impossible to know what strategies are likely to be effective, much less optimal. Finally, because pieces may not uniquely fit together, two different things may happen. First, we may hit a dead end. After assembling pieces in a way that seems to be working, we may find that we can go no further. We may have to undo what we have done. This is common with another type of puzzle, the Rubik's cube. Second, it may be the case that there is more than one solution to the puzzle. This is true of Scrabble.

[4]The use of multiple strategies relates to John Dewey's theory of holism. Richardson (1997) describes Dewey's theory as the recognition and commitment to a strategy that seeks coherence through analysis and evaluation at multiple levels.

What the puzzle metaphor demonstrates is that we can have intentionality without knowing what specifically we are trying to accomplish, without having an idea of what strategies might be effective, much less optimal, or without being confident that the action we have chosen will turn out to be feasible. We can have intentionality in a situation that is inchoate.

An important class of inchoate situations involves actors who have generic as opposed to specific goals. By a generic goal, I mean an end that is insufficiently specified that it is not possible to evaluate what would be the best strategy for achieving it. The discussion above of a difficult jigsaw puzzle constitutes one such example. Other examples of generic goals are easy to come by: "to live a full life," "to have a well-functioning organization," and "to have a good marriage." In each of these cases, it is not precisely clear what it would mean to achieve the goal. The actors may come to know, however, upon obtaining the goal that it has been reached. Since it is not clear ex ante what it would mean to achieve the goal, it is also not possible to know the optimal way to achieve it. It may be clear that some choices almost certainly wouldn't lead to the goal, e.g., moving to the country if one hates rural life and has bad hay fever.

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Modes of Rationality: The Rational, Subrational, and Extra-Rational

For the purpose of distinguishing my concept of extra-rationality from other modes of thought, I propose a rough typology consisting of three types of rationality: the traditional rationality of economics, Kahneman's System I thinking which I label subrationality, and extra-rationality. I make no claim that this typology is fully adequate for understanding different modes of behavior. Rather my goal is just to use it as a means to distinguish extra-rationality from traditional rationality and subrationality, most closely thought of as Kahneman's System I thinking. Below, I focus primarily on the contrast between traditional rationality and extra-rationality.

In my typology, traditional rationality is what economists mean by the term. This is a narrow concept of rationality that understands people as having known options, an understanding of what options are feasible, and an ability to evaluate the desirability of these options. Traditional rationality predicts that individuals will choose that option they most prefer. More generally, traditional rationality encompasses various forms of game theory as well as Gintis's BPC model, to be discussed in detail below, of beliefs (B), preferences (P), and constraints (C).[5]

Subrationality describes situations and choices where traditional rationality is potentially applicable, but individuals rely on simpler mechanisms of choice:

[5]It should be clear that this notion of rationality is quite distinct from Weber's different concepts of rationality (Brubaker 1984) or the more generic common concept of rational meaning reasonable or sensible behavior.

satisficing, heuristics, or habits. Generally, this type of action is considered to be automatic, possibly to take place unconsciously, and as such does not involve the conscious consideration found in the economist's model of rationality. As such, it is meant to include Kahneman's System I. Often these methods can lead to good or near-optimal choices (Gigerenzer et al. 1999, Gigerenzer 2000); other times, they can fail miserably. For example, the assumption that a catastrophic earthquake is highly unlikely to happen is often a very good one, though, as the experience of Japan in 2011 demonstrates, it can also be a very bad one. These methods are attractive, in part, because they often involve less effort.

Subrationality is also the world of cognitive biases—situations where individuals are consistently shown to make choices that are biased in the sense that they are not fully rational. Subrationality, therefore, in part consists of *psychological* deviations from rationality. Individuals could make the rational decision, but for a variety of possible reasons, they don't.

The world of the extra-rational is about situations where traditional rationality is not possible because the situations are inchoate: we cannot understand the situation, we understand it partially but don't know how to evaluate different options, and/or we do not know what options are feasible. An individual might prefer to act rationally (or subrationally) but cannot. To provide a fuller understanding of extra-rationality, we need first to examine the necessary conditions for standard rationality in more detail.

Conditions for Standard (Economic) Rationality: Gintis's BPC Model[6]

In his 2009 book, *The Bounds of Reason: Game Theory and the Unification of the Behavioral Sciences*, Herbert Gintis provides an elegant and at times highly technical presentation of rational choice theory in the context of game theory in its past and recent manifestations. As the subtitle of the book suggests, Gintis believes that game theory—and especially newer variations such as epistemic game theory—provides a singular theory of behavior capable of unifying the social sciences. As noted above, Gintis refers to this as the beliefs, preferences, and constraints (BPC) model of behavior.

Gintis's formulation of rational choice theory is particularly advantageous for my analysis of extra-rationality, because it precisely elaborates the conditions that must obtain if rational action in an economist's sense is to occur. Drawing from Gintis's definition, I discuss what it means within rational choice theory for there to be beliefs, preferences, and constraints. In subsequent sections, I provide various examples of situations where one, many, or all of these conditions are not met.

[6]In an old and infrequently cited paper, James March (1982) provides a very similar typology for what he terms standard theories of choice.

Beliefs In the BPC model, beliefs imply a number of conditions. First is that an individual has a well-defined set of options to choose from. In the context of game theory, this means that there are well-specified moves in the game. An actor may use a probabilistic mechanism to make different choices, but in any one play of the game, he chooses, perhaps randomly, one specific option or alternative. Second is that an individual knows the consequences of these choices. These too can be deterministic or probabilistic, but if probabilistic, the probabilities of different outcomes are known.[7] In other words, an individual can place a bet in a lottery but know what the likelihood of winning is and if they win what they will win.

Preferences Preferences imply that an individual can rank the order of desirability AU3
of different outcomes. For an individual's preferences to be consistent, they must be transitive, i.e., if A is preferred to B and B is preferred to C, then A must be preferred to C.[8] What is key about preferences is that individuals find the choices they are faced with commensurable, that is, they can compare them and are able to decide which choice is preferable.

Constraints A central question in economics is how individuals behave in the context of scarcity. All of us have a finite amount of time and money to allocate. In a famous 1962 paper in the *Journal of Political Economy*, Gary Becker showed that most of the results from consumer demand theory could be derived by simply assuming that individuals lie across an income constraint line where one then analyzed how their behavior would change as the line was moved out or rotated. Thus, key to Becker's analysis is that for individuals to choose among different options, they need to know which options are feasible, that is, the constraints that they face.[9]

Inchoate Situations

If beliefs, preferences, and specified constraints are necessary for rational choice theory, what do situations look like where one or more of these conditions are not satisfied? To convince the reader that this sort of situation is fairly common, I provide a variety of examples below.

[7]Or more precisely, individuals have a Bayesian prior specifying the likelihood of the different outcomes.

[8]An extensive literature in economics and political science has examined how group preferences are not necessarily consistent in the sense of being transitive. This goes back at least as far as Condorcet's paradox (1785) and is at the core of Arrow's impossibility theorem (Arrow 1951).

[9]There is an important subtlety to the rational actor model. When it is pointed out to economists that actual individual behavior often does not appear rational, they will respond that what rational choice theory requires is that individuals act in a way that is consistent with rationality, not that they actually will be rational (Friedman 1953). The argument is that if people are not rational, the market (world) will punish them and their behavior will not be sustainable as actors who act rationally are more successful. Implied in this argument is the assumption that markets are sufficiently tightly coupled that one cannot get away with irrational behavior over the long term.

Below, I first discuss situations that are incomprehensible in that an individual or group may not have an adequate set of beliefs about a situation. This is the case where Gintis's "B" component fails. Subsequently, I discuss situations where there is incommensurability, that is, preferences are not well defined. This is the case where Gintis's "P" component is absent. Finally, I discuss of unspecified attainability, that is, situations, where constraints are unknown. This is the case where Gintis's "C" component is problematic.

Incomprehensible Situations The classic discussion in economics of situations that is incomprehensible is found in Frank Knight's distinction between situations that are risky versus uncertain (Knight 1921). A risky situation is one in which outcomes are determined probabilistically and the probabilities are known or at least believed to be known. It is under these circumstances that economists' well-developed extension of rational choice theory, expected utility theory, as well as epistemic game theory applies. The basic assumption is that rather than maximizing actual utility, individuals will choose, because outcomes are probabilistic, that strategy that maximizes their expected utility (where the expected utility of any particular strategy is the probability weighted average of the utility of the different outcomes that may occur under that strategy).

In contrast, according to Knight, situations are uncertain or, as I term it, incomprehensive, when outcomes are probabilistically determined but the probabilities are unknown to the decision-maker. In this case, where there is no way to calculate the probabilistically weighted average of different outcomes under different strategies, expected utility theory fails to apply. A piece of information necessary for individuals to evaluate the desirability of different choices—the likelihood of different outcomes under alternative strategies—is missing.

Consider a quite different example of incomprehensibility from political science. In the opening chapter to his rightly famous book, *Seeing Like a State*, James Scott describes the challenge faced by the Prussian state in the eighteenth century in trying to estimate the economic value of its forests. Because these were natural forests, they were "untamed." From the state's perspective, the forests, to use Scott's felicitous term, were "illegible." The state had no way of calculating their economic value. In short, the forests are incomprehensible. We will discuss Scott's work further below.

Incommensurability[10] Some situations may be comprehensible, but still not yield to rational choice—one's options are well defined, but the values of different options are not commensurable. One of the most famous examples of incommensurability is Sartre's young man described in his book *Existentialism and Humanism*. The time is World War II. A man's older brother has been killed while fighting in the French Resistance. His mother, meanwhile, is ill and in need of care. The question the young man faces is whether to join the resistance and thereby honor his

[10]For a detailed philosophical treatment of the problem of incommensurability, see the essays of Ruth Chang, *Incommensurability, Incomparability, and Practical Reason* (1997).

brother's commitments or stay home and care for his ailing mother. Sartre's point is that there is no a priori way for the young man to decide or in economist's terms to order his preferences. His two choices are incommensurable. In deciding one way or the other, he will become a particular type of person with preferences consistent with that choice, but there is no reason prior to making the choice he should value one option over the other.

In his trade book, *The Paradox of Choice*, Barry Schwartz discusses a line of experiments in which individuals are asked to choose an item from a set of consumer goods. Typically, this takes place in a supermarket. If individuals are given either too many choices or choices varying across too many dimensions, more often than not, they will refrain from choosing altogether. The result is a straight contradiction of rational choice theory: when there are few choices, the individual prefers the good, call it A, to buying nothing; when he has more choices, he prefers nothing to A.[11] An article in *Newsweek* (Begley 2011) discusses the neurophysiology of such situations. Apparently, when an individual is faced with too many choices, or more generally with too much information, a portion of the prefrontal cortex, the area where rational calculation occurs, ceases functioning. The brain "freezes." It becomes impossible for the person to assess their preferences, and thus, their different choices are incommensurable.

More generally, if we are in any situation where there are competing and contradictory goods in the philosophical sense, incommensurability, a lack of preference ordering, is a problem. A classic example is going to dinner at one's mother and having a bad meal. How does one choose between being frank, i.e., truth telling, and protecting one's mother's feelings? In being frank, one is telling the truth but will hurt her feelings. However, in being diplomatic, one is less than truthful, but her feelings are spared.[12] There is no obvious standard by which to choose between the two options. Certainly, many more examples of incommensurability could be given. The point is that such situations are common (e.g., see Sandel 2010). When options are incommensurable, there is no rational basis for making a choice.

Unspecified Attainability (Unknown Constraints) The rational choice model assumes that in making a choice, one knows how to attain it. Examples violating this assumption abound. In the decision theory literature, there is the problem of multiple local maxima. If a function has multiple maxima, then the only way to discover the global maximum is to try a large number of starting points. With single maxima (or for that matter, various computer algorithms), we know how to find it: go uphill till one finds the top, i.e., the most preferred outcome. If multiple maxima exist, then each hill must be climbed to discover which is the highest. If there are

[11]Technically, this is a violation of the independence of irrelevant alternative assumption.

[12]Some philosophers, most notably Kant, have argued that true moral conflicts are inconceivable. See articles of Christopher Gowan, editor, *Moral Dilemmas* (1987).

many, possibly infinite maxima (hills), attaining the true maxima may well be unattainable.

A similar set of issues exist in what computer scientists call NP-hard computing problems. For this class of problems, it is relatively easy to test whether something is a solution. Finding solutions, however, can be hard. A computing problem is NP-hard if, as the size of the problem grows, the time needed to find a solution grows faster than polynomial time. Intuitively, what this means is that as the size of the problem increases the amount of computer time needed to solve it grows so fast that finding a solution becomes infeasible. Many everyday problems turn out to be NP-hard. For example, finding an overall schedule that provides a solution where all individuals who want to meet separately with each other can do so is an NP-hard.[13] A second example of an NP-hard problem is any (Boolean) truth statement. As the number of terms or conditions involved grows, the amount of computing needed makes finding a solution infeasible. In general, there are entire groups of problems involving storage and retrieval, sequencing and scheduling, and games and puzzles that are NP-hard.[14] In each of the cases, the computational demands may make finding the optimal solution impossible, that is, unattainable.

The problem of unspecified attainability, that is unknown constraints, also occurs in many real-world problems. Consider a couple's decision to have children. Will they be able to conceive naturally? Will one or both of them need fertility treatments? Will it be necessary to use in vitro fertilization? Will adoption be an option? People make many decisions without knowing what constraints they will face. If the likelihood of different constraints being binding can be calculated, then the economic theory of expected utility can be used. One wonders, however, how often individuals have even the vaguest idea of the constraints that may circumscribe their behavior.[15]

More generally, any exploration involves a situation where the explorer may have no idea of what constraints he will face. In Knight's language, there is (complete) uncertainty. In attempting to find a passage to India, Columbus had no idea that his path would be constrained by a large continent and not one but two oceans. As Zerubavel (2003) describes in detail in his book *Terra Cognita*, it took multiple trips before Columbus realized that the New World was not simply a set of islands off the coast of China. Exploration of new lands, new situations, or new times often means having no understanding of the constraints that will appear. As such, one does not even know what options are viable, much less optimal.

[13]For a discussion of scheduling problems, see Winship (2009).

[14]The classic discussion of NP-hard or in their NP-complete problems is Garey and Johnson. 2002. *Computers and Intractability: A Guide to the Theory of NP-Completeness*.

[15]L. A. Paul argues that having a child is such a transformative experience that one cannot possibly know what having a child would be like (Paul 2014). This raises the deep question of what it means to have a preference for some option when one cannot evaluate what it would be like for that option to be realized.

Extra-Rational Behavior Strategies I: Incomprehensible Situations/Unspecified Attainability

The strength of rational choice theory is that it makes specific predictions about how people's behavior will change when the constraints they face change. No such analogous theory exists for extra-rational situations. Examples of how people actually respond to inchoate situations, however, are easy to come by. In what follows, I describe a wide variety of responses, starting with incomprehensible situations and/or situations with unspecified attainability. Strategies in these situations appear to be similar. The first solutions discussed below are variants on a common theme—take action even if you do not know what the consequences of the action will be. The second set of strategies involves assuming or imposing a simplifying structure on the world. A third strategy is avoidance. I then turn to situations characterized by incommensurability. In this case, the solutions apparently are more specialized.

Taking Action: Random Choice Sometimes, individuals may act randomly in a situation. Karl Weick (1979) describes the hunting strategy of the Naskapi Indians. The question the Naskapi face is in what direction to search for a game. They decide by holding a caribou shoulder over a fire. A shaman then decodes the spots that appear and points the hunters in a direction. Weick interprets this procedure as providing a randomized way of determining a direction for the hunt. As Weick understands it, the problem for the Indians was how to adjudicate between two competing principles. On the one hand, if they had found a game in one place, it would make sense to return there. On the other hand, repeatedly returning to the same place would deplete the game in that area. Weick argues that in this context, a random strategy may well be optimal and in so doing treat different alternatives as incomprehensible.

Taking Action: Being Present In his book, *The Sense of Dissonance*, David Stark describes how in the late 1990s a group of web designers working in Silicon Alley in New York had no idea what products they should be producing—their situation was incomprehensible. They realized, however, that in order to compete, they needed to be carrying out designs. As a result, they found themselves creating products the end result of which was only clear near their completion.

In a similar way, the inner-city black ministers I have observed in my research on youth violence decided "to be present" on the streets. After an attempted slaying in a church during the funeral of a gang member, the ministers were unsure about what to do. They couldn't comprehend their current situation. They decided to walk the streets from 10 PM to 2 in the morning and then to meet until dawn to discuss what they had seen and experienced. Asked to describe their decision, they simply stated that God had called on them to be present. In multiple interviews, they have been quite explicit about the fact that they had no specific goal or, perhaps more precisely, the goal was unknown to them (Winship, unpublished).

Taking Action: One Step at a Time In her fascinating book, *Impossible Engineering*, Chandra Mukerji describes the construction in the seventeenth century of the Canal du Midi in Southwestern France. Mukerji points out that the engineering knowledge required to build a canal connecting the Atlantic to the Mediterranean did not exist at that time. As in my other examples, they couldn't comprehend everything that needed to be done. Despite this, engineers and local workers led by a prominent farmer combined abstract and local knowledge and successfully completed the canal. The basic strategy was to figure out what needed to be done one piece or one step at a time.

Taking Action: Keep Trying An important argument in the literature on entrepreneurship is that success may be simply a function of how many different initiatives one tries. In colloquial language, the number of hits one is likely to get is simply a function of how many times one has gone to bat. Recent research on entrepreneurs suggests that they often do not have well-developed plans but rather simply place themselves in a context they hope will be productive (Sutton 2002). As such, they act in a situation which is not fully if at all comprehensible.

More generally, learning can take place through a process of trial and error. The business consultant Jim Manzi has pointed out that in situations where one totally lacks any knowledge, trial and error may be an effective means of acquiring that knowledge. Rather than making assumptions about how the world works, one can try out different strategies and use their success or failure to gain an understanding of one's situation (Manzi 2012).

Simplifying In contrast to strategies that put acting first, another strategy is to assume that a simpler understanding of a situation is correct. Kahneman and Shane (2002) describe this as substitution: one substitutes a simpler and inaccurate understanding of the situation for a more complicated one. Basically, one declares a situation to be comprehensible. They point out that individuals often do this unknowingly. More familiarly, any math modeler should recognize this strategy. An accurate mathematical model is simply too complicated to analyze. In order to make the analysis tractable, a modeler makes simplifying assumptions. The debate then is about whether those assumptions have sufficiently distorted the world to make the conclusions of the analysis invalid (Rodrik 2015).

More drastic than making simplifying assumptions, actors can restructure the world so that it becomes simpler. In the introduction to *Seeing Like a State*, James Scott describes in detail how the seventeenth-century Prussian government reengineered its forests so that they were legible (comprehensible). Scott uses two photos to illustrate the difference between the illegible, untamed forest, and the structured, legible, tamed forest. In one photo, the forest is untamed and chaotic. In the other, trees grow in clean, straight rows.

Of course, a moment's glance around our world of buildings, roads, and information systems reveals how humans over centuries have not only restructured the world to make it more usable but to make it, in Scott's terms, more legible. If some component of the world is not easily comprehended, then one can restructure it so that it is. Obviously, the huge advances of the last several decades in information technology are only the latest examples of this effort.

Fig. 2 Cartoon (printed with permission of *The New Yorker*)

Avoidance I am told by the people at *The New Yorker* that the illustration (Fig. 2) is one of their most popular cartoons of all time. It illustrates the simplest strategy in dealing with an inchoate situation: to simply give up or avoid such situations. As the cartoon indicates, sometimes finding a solution is just too hard. But underlying the cartoon's humor is a deeper point. We often seek to live our lives in worlds that are comprehensible. We may well choose a career, a spouse, or an area to live in because it is "familiar" to us. In the extreme, we choose to live in "civilization" as opposed to the "frontier" because it is "known" territory.

Strategies II: Incommensurability

As noted above, situations that lack commensurability involve different strategies. I discuss three here.

Packaging Wakeham (2012) has studied juvenile sentencing in Massachusetts. AU4
Sentencing in Massachusetts is not decided by a judge but rather by an administrative committee appointed by the court consisting of different types of professionals. In deciding on a juvenile's sentence, many different criteria could be used: state guidelines, therapeutic interests, the safety and rights of the community, and/or the abstract idea of what would be "just." Wakeham finds that these committees rarely argue about what the appropriate criteria should be. Instead,

they work hard to understand the situation and in doing so find a sentence that is simultaneously consistent with all of the above criteria. In contrast to Walzer's (1983) work in *Spheres of Justice* or that of Boltanski and Thévenot (2006) in *On Justification*, the question is not one of deciding which sphere or logic is appropriate but rather of finding an understanding that makes them all appropriate.

Patience In any situation where one is faced with two incommensurable options, most of us would simply like to have both. We would, according to the popular idiom, like to "have our cake and eat it too." In *The Struggle for Water: Politics, Rationality, and Identity in the American Southwest*, Wendy Espeland (1988) describes a multi-year conflict between the US Army Corps of Engineers and the Yavapai Indian Tribe in Arizona. The Corps of Engineers wanted to build a large dam that would provide water for the rapidly growing population in Arizona and Southern California. However, any dam they built would flood the Yavapai's ancestral burial grounds. Over the years, the corps' offers of more and more money for the land were met by the Yavapai's insistence that "one does not sell one's mother." Thus, there appeared to be no way to both build the needed dam and to maintain the Yavapai's burial grounds. The problem was resolved after many years, when a new generation of engineers who believed in small as opposed to large dams joined the corps. By building small dams, it proved possible to provide the water needed without flooding the Yavapai's burial grounds.

Emotions Recent psychological research has focused on the role of emotions in decision-making. An important result in this literature is that emotions may be critical to helping individuals make better decisions in complicated decision contexts. If one is currently at Harvard and trying to decide whether to move to Yale, one could create a long list of the areas in which one institution was superior to the other. Presumably, on some criteria, Harvard would be superior to Yale, and on other, Yale superior to Harvard. If not, the decision is easy. However, unless we know how to aggregate over these criteria, such a list may not be very helpful. We cannot quantitatively decide whether one choice should be preferred to another. We, however, might make the decision that feels right with research showing that making a decision emotionally is likely to result in a better decision (Bechara et al. 1997; Shiv and Fedorikhin 1999).

An Extended Example: Work and the Transition to Adulthood—Three Ideal Types for Work[16]

Above, I have offered a typology of rationality: subrationality in the sense of fast, subconscious, and habitual thinking; the traditional rationality of economists based on optimizing behavior; and the extra-rationality where either because of undefined

[16]I am grateful to Neil Gross for suggesting this example. An earlier draft of this paper used the analogy to being on a "boat": subrationality as being on a pleasure cruise with no need

preferences, a lack of knowledge, or unknown constraints, pursuit of a specific, concrete goal is impossible. In bringing this paper to a close, I briefly discuss the application of this typology to one particular context—the transition into adulthood and work. In doing so, my aim is to illustrate the differences in the three types of rationality within a single broad context. In addition, I demonstrate the potential importance of the typology in analyzing a social phenomenon of broad sociological interest.

For many individuals at different times and places, the available employment options open to them have been essentially fixed and often singularly. Focusing on relatively recent examples, there is the son who follows his father to the coal mines (McIntosh 2000) or the auto-plant (Milkman 1997) and a daughter who becomes a housewife or works as a seamstress as her mother did (Glenn 1991; Shaffer 1980). Conscious rational thought is typically not needed—one starts work in the "job," perhaps even as a child (McIntosh 2000), that is available and expected and in the process takes a step in the transition to adulthood. The mindless nature of this process is famously documented by Willis (1977) in his classic book *Learning to Labor*.[17] Such singular pathways often characterize the working class and the total lack of any opportunity for upward mobility. There are of course important exceptions—the child who inherits his father's business (Gersick 1997) or, in the extreme, the son who succeeds his father as King. Additional historical examples across multiple societies are ubiquitous and don't need to be rehearsed here. Here, preferences are generally irrelevant—there is no choice involved. The process is explicit—one follows in the appropriate manner through a predetermined pathway. The constraints are known and fully binding. The thought that one might do something different may never occur.

More recent times and more typically for the children of middle-class families, career choice can be a fundamental decision point in the transition to adulthood. Here, rationality in the economist's sense may be operative. The choice of college major or program is often explicitly linked to particular occupational choice with the end goal of optimal success. One goes through premed in order to go to medical school, working to get top grades so that one can get into the most selective school possible; one then goes on to an internship and residency, each time hoping to maximize one's career chances (Becker et al. 1961; Freidson 1988). Similarly, one may major in economics and specialize in finance with the hope of landing a job at a top Wall Street firm (Roose 2014). In the working class, this may involve choosing a particular vocational track in high school. In countries such as Germany and Japan, among others, where firms are tightly linked with specific high schools and have formal apprenticeship structures, what one needs to do in order to succeed in a particular career line may be quite explicit (Rosenbaum 2001; Ryan 2001). In these

to optimize, a racing yacht where optimality is critical, and a raft made of flotsam in the open where the hope is to find unsighted land at some point.

[17]Other relevant examples would be Halle's (1984) *America's Working Man* and Desmond's (2008) *On the Fireline*.

cases, there are multiple, distinct pathways leading to different careers that individuals choose from. In addition, within each pathway, individuals typically do their best to succeed in order to achieve an optimal outcome. Here, one's preferences guide one's choices. One knows what one has to do to realize those preferences—e.g., if one wants to become a doctor, one needs to go to medical school—finally, constraints are known or knowable, e.g., one needs to find means to pay for medical school though medical schools may or may not make different options explicit.

In contrast to the subrational situation where choice is not relevant and the rational situation where preferences, processes, and constraints are known and thus rational choice is possible, young adults may find that there are many potential pathways where they have no idea what career or occupation would suit them well, only the vaguest idea of process involved or the constraints involved in any specific choice—on the later point, for example, whether one needs to pay in order to get a Ph.D. in a liberal arts and sciences discipline.

In the current period (2016) in the USA, there has been much anguish about the number of young adults who seem to have no idea what career they should pursue. The popular movie *Failure to Launch* in which Matthew McConaughey is still living with his parents at age 40 typifies this anxiety. There have also been multiple books written describing these young adults as lost or adrift (e.g., Arum and Roksa 2011; Smith 2011). Perhaps, the most dramatic contemporary example as documented by Brinton (2010) is the situation in Japan where changing economic structures and breakdown of traditional linkages between high schools and employers have left a whole generation of noncollege-educated youth not knowing the what or the how of pursuing a career. As a result, they, particularly males, spend endless hours at home playing video games. Here, the situation is sufficiently *inchoate* that they have no idea what to do in order to make the transition into adulthood.

What the above three classes of examples illustrate is the social context that drives the nature of choice. Thus, whether behavior is subrational, rational, or extra-rational is not so much a matter of an individual's psychology but rather the properties of the social context an individual finds themselves in and their relation to it. To be blunt, it is the sociology of the situation, the context, and an individual's relation to it, not an individual's psychology, that determines what type of rationality is possible and what type is needed. At one extreme in the subrational, rational choice may not be needed—one just does what the situation defines as obvious or appropriate. In situations where multiple options are available, traditional rational choice may be operative, but this requires that individuals have defined preferences and understand a situation and the constraints they are faced with. In the absence of these later requirements, individuals may find themselves lost, randomly choosing directions, exploring different options, and making false assumptions about the situation but making decisions based on those assumptions nonetheless. This is the world of extra-rational behavior.

Conclusion

In a pragmatist spirit, this paper suggests that social science needs multiple theories of action. Economists have long used the rational actor as their core concept for understanding human behavior. What happens, however, if the conditions needed for rationality are not present in a specific situation? I suggest that when situations are "inchoate," individual's behavior will be "extra-rational." I use Gintis's beliefs, preferences, and constraints (BPC) model to specify his three conditions for rationality. I have examined a variety of real-world situations that are inchoate, that is, situations in which one or more of these conditions do not hold. I provide a non-exhaustive list of how individuals behave in situations where rationality is not possible. In the case of situations where the conditions for rationality in terms of beliefs and/or constraints are not met, I suggest that there are a variety of possible ways people may respond.

Acknowledgments Neil Gross, Isaac Reed, Van Tran, and Josh Wakeham made useful suggestions based on an earlier version of the paper. Jonathan Imber provided helpful information. Special thanks to Christopher Muller who provided in-depth suggestions on multiple drafts. I also particularly appreciate comments and encouragement Herb Gintis offered. Genevieve Butler provided important editorial advice. Of course, any remaining errors and flaws are the author's responsibility.

References

AU6

Arrow, Kenneth J. 1951. *Social Choice and Individual Values*. New York: Wiley.

Arum, Richard, and Josipa Roksa. 2011. *Academically Adrift: Limited Learning on College Campus*. Chicago: University of Chicago Press.

Bechara, Antoine, Hanna Damasio, Daniel Tranel, and Antonio Damiso. 1997. Deciding advantageously before knowing the advantageous strategy. *Science* 28 (February): 1293–1295.

Becker, Gary. 1962. Irrational behavior and economic theory. *Journal of Political Economy* 70 (1): 1–13.

Becker, Howard S., Blanche Geer, and Everett C. Hughes. 1961. *Boys in White: Student Culture in Medical School*. Chicago: University of Chicago Press.

Begley, Sharon. 2011. The Science of Making Decisions. *Newsweek*, February 27, 2011.

Boltanski, Luc, and Laurent Thévenot. 2006. *On Justification: Economies of Worth*. Princeton: Princeton University Press.

Bourdieu, Pierre. 1977. *Outline of a Theory of Practice*. Vol. 16. Cambridge: Cambridge University Press.

Brinton, Mary. 2010. *Lost in Transition*. Cambridge: Cambridge University Press.

Brubaker, Rogers. 1984. *The Limits of Rationality: An Essay on the Social and Moral Thought of Max Weber*. London: Allen & Unwin.

Chang, Ruth, ed. 1997. *Incommensurability, Incomparability, and Practical Reason*. Cambridge: Harvard University Press.

Condorcet, Marquis de. 1785. *Essai sur l'application de l'analyse à la probabilité des décisions rendues à la pluralité des voix* (*Essay on the Application of Analysis to the Probability of Majority Decisions*)

AU7

Desmond, Matthew. 2008. *On the Fireline: Living and Dying with Wildland Firefighters*. Chicago: University of Chicago Press.
Dewey, John. 1939. Theory of valuation. *International Encyclopedia of Unified Science*.
Espeland, Wendy N. 1988. *The Struggle for Water: Politics, Rationality, and Identity in the American Southwest*. Chicago: University of Chicago Press.
Evans, J.S.B. 2008. Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology* 59: 255–278.
Freidson, Eliot. 1988. *Profession of Medicine: A Study of the Sociology of Applied Knowledge*. Chicago: University of Chicago Press.
Friedman, Milton. 1953. *The Methodology of Positive Economics. Essays in Positive Economics*. Chicago: University of Chicago Press.
Garey, Michael R., and David S. Johnson. 2002. *Computers and Intractability: A Guide to the Theory of NP-Completeness*. Vol. 29. New York: W. H. Freeman.
Gersick, Kelin E., ed. 1997. *Generation to Generation: Life Cycles of the Family Business*. Boston, MA: Harvard Business Press.
Gigerenzer, Gerd. 2000. *Adaptive Thinking: Rationality in the Real World*. Oxford: Oxford University Press.
———. 2008. *Rationality for Mortals: How People Cope with Uncertainty*. Oxford: Oxford University Press.
Gigerenzer, Gerd, and Reinhard Selten, eds. 1999. *Bounded Rationality: The Adaptive Toolbox*. Cambridge: MIT Press.
Gigerenzer, Gerd, Peter M. Todd, and the ABC Research Group. 1999. *Simple Heuristics That Make Us Smart*. Oxford: Oxford University Press.
Gigerenzer, Gerd, Ralph Hertwig and Thorseten Pachur (Eds.) 2011. *Heuristics: The Foundations of Adaptive Behavior.* Oxford University Press Oxford.
Gintis, Herb. 2009. *The Bounds of Reason: Game Theory and the Unification of the Behavioral Sciences*. Princeton: Princeton University Press.
Glenn, Susan A. 1991. *Daughters of the shtetl: Life and labor in the immigrant generation*. Ithaca: Cornell University Press.
Gowan, Christopher, ed. 1987. *Moral Dilemmas*. Oxford: Oxford University Press.
Gross, Neil. 2009. A pragmatist theory of social mechanisms. *American Sociological Review* 74 (3): 358–379.
Hacking, Ian. 1998a. *Rewriting the Soul: Multiple Personality and the Sciences of Memory*. Princeton: Princeton University Press.
———. 1998b. *Mad Travelers: Reflections on the Reality of Transient Mental Illnesses*. Charlottesville: University of Virginia Press.
Halle, David. 1984. *America's Working Man: Work, Home, and Politics Among Blue Collar Property Owners*. Chicago: University of Chicago Press.
Joas, Hans. 1996. *The Creativity of Action*. Chicago: University of Chicago Press.
Kahneman, Daniel. 2002. *Maps of Bounded Rationality: A Perspective on Intuitive Judgment and Choice*. Nobel Prize Lecture, December 8, 2002.
———. 2003. Maps of bounded rationality: Psychology for behavioral economics. *The American Economic Review* 93 (5): 1449–1475.
———. 2011. *Thinking, Fast and Slow*. New York: Macmillan.
Kahneman, Daniel, and Frederick Shane. 2002. Representativeness revisited: Attribute substitution in intuitive judgment. In *Heuristics and Biases: The Psychology of Intuitive Judgment*, ed. Thomas Gilovich, Dale Griffin, and Daniel Kahneman, 49–81. Cambridge: Cambridge University Press.
Knight, Frank H. 1921. *Risk, Uncertainty and Profit*. New York: Hart, Schaffner and Marx.
Manzi, Jim. 2012. *Uncontrolled: The Surprising Payoff of Trial-and-Error for Business, Politics, and Society*. New York: Basic Books.
March, James G. 1982. Theories of choice and making decisions. *Society* 20 (1): 29–39.

McIntosh, Robert. 2000. *Boys in the Pits: Child Labour in Coal Mines*. Montreal: McGill-Queen's Press-MQUP.
Milkman, Ruth. 1997. *Farewell to the Factory: Auto Workers in the Late Twentieth Century*. Berkeley: University of California Press.
Mukerji, Chandra. 2009. *Impossible Engineering: Technology and Territoriality on the Canal du Midi*. Princeton: Princeton University Press.
Muller, Christopher, and Christopher Winship. 2010. John Dewey: The sociology of action. In *Sociological Insights of Great Thinkers: Sociology through Literature, Philosophy, and Science*, ed. Christofer Edling and Jens Rydgren. Santa Barbara, CA: Praeger.
Paul, Laurie A. 2014. *Transformative Experience*. Oxford: Oxford University Press.
Richardson, Henry S. 1997. *Practical Reasoning About Final Ends*. Cambridge: Cambridge University Press.
Rodrik, Dani. 2015. *Economics Rules: The Rights and Wrongs of the Dismal Science*. New York: W. W. Norton.
Roose, Kevin. 2014. *Young Money: Inside the Hidden World of Wall Street's Post-Crash Recruits*. London: Hackette.
Rosenbaum, James. 2001. *Beyond College for All: Career Paths for the Forgotten Half*. New York: Russell Sage Foundation.
Ryan, Paul. 2001. The school-to-work transition: a cross-national perspective. *Journal of Economic Literature* 39: 34–92.
Sandel, Michael J. 2010. *Justice: What's the Right Thing to Do?* New York: Macmillan.
Sartre, Jean-Paul. 1960. *Existentialism and Humanism*. London: Methuen.
Schwartz, Barry. 2004. *The Paradox of Choice*. New York: Harper Collins.
Scott, James. 1998. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press.
Shaffer, John W. 1980. Family, class, and young women: Occupational expectations in nineteenth-century Paris. In *Family and Sexuality in French History*, ed. Robert Wheaton and Tamara K. Hareven, 179–200. Philadelphia: University of Pennsylvania Press.
Shiv, Baba, and Alexander Fedorikhin. 1999. Heart and Mind in Conflict: Interplay of Affect and Cognition in Consumer Decision Making. *Journal of Consumer Research* 26 (December): 278–282.
Simon, Herbert. 1956. Rational choice and the structure of the environment. *Psychological Review* 63 (2): 129–138.
Simon, Herbert A. 1957. *Models of Man: Social and Rational*. New York: Wiley.
Smith, Christian. 2011. *Lost in Transition: The Dark side of Emerging Adulthood*. Oxford: Oxford University Press.
Stark, David. 2009. *The Sense of Dissonance: Accounts of Worth in Economic Life*. Princeton: Princeton University Press.
Sutton, Robert I. 2002. *Weird Ideas That Work: 11 1/2 Practices for Promoting, Managing, and Sustaining Innovation*. New York: Simon and Schuster.
Swedberg, Richard. 1990. *Economics and Sociology: Redefining Their Boundaries: Conversations with Economists and Sociologists*. Princeton: Princeton University Press.
Wakeham, Josh. 2012. *Managing in the Face of Ambiguity and Uncertainty: The Problems of Interpretation and Coordination in Juvenile Justice Organizations*. Ph.D. Dissertation, Harvard University.
Walzer, Michael. 1983. *Spheres of Justice: A Defense of Pluralism and Justice*. New York: Basic Books.
Weick, Karl. 1979. *The Social Psychology of Organizing*. Reading, MA: Addison-Wesley.
Weick, Karl E. 2001. *Making Sense of the Organization*. Oxford: Blackwell.
Whitford, Josh. 2002. Pragmatism and the untenable dualism of means and ends: Why rational choice theory does not deserve paradigmatic privilege. *Theory and Society* 31 (3): 325–363.
Willis, Paul E. 1977. *Learning to Labor: How Working Class Kids Get Working Class Jobs*. New York: Columbia University Press.

Winship, Christopher. 2005. *Between Two Rationalities*. Cambridge: Harvard University. unpublished.

———. 2006. Policy analysis as puzzling. In *Oxford Handbook of Public Policy*, *Oxford Handbooks of Political Science*, ed. Michael Moran, Robert E. Goodin, and Martin Rein, vol. 10, 109–123. Oxford: Oxford University Press. Chapter 5.

———. 2009. Time and scheduling. In *The Oxford Handbook of Analytical Sociology*, ed. Peter Hedstrom and Peter Bearman, 498–520. Oxford: Oxford University Press.

Zerubavel, Eviatar. 2003. *Terra Cognita: The Mental Discovery of America*. New York: Transaction Publishers.

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