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**STRATEGIC FORESIGHT AS DYNAMIC CAPABILITY**  
**A NEW LENS ON KNIGHTIAN UNCERTAINTY**

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## ABSTRACT

This paper proposes to treat strategic foresight as a dynamic capability, providing a new theoretical lens on managerial judgment. Formulating strategy under uncertainty is a central challenge facing the modern firm. Analogy is thought to help managers make sense of novel situations through comparison to past experience. However, from a Knightian perspective, uncertainty precludes analogy because such situations are unique. Even if one relaxes this conclusion, acknowledging “degrees of uniqueness,” analogy remains an unreliable guide because it triggers biases that encourage the adoption of difficult-to-change hypotheses about the future. Nevertheless, analogical reasoning suggests how managers might better respond to uncertainty. This paper argues that, just as we learn from the past by imagining counterfactuals, so too can we learn from the future by simulating experiences—a process that reduces bias and renders us more perceptive, flexible, and adaptable to environmental change. That is the premise of strategic foresight methods like scenario planning, yet such methods have struggled to find theoretical purchase in the general management literature. Noting that the basis of strategic foresight aligns with the microfoundations of dynamic capabilities, this paper integrates research on individual decision-making with firm-level perspectives to suggest a new theoretical approach to managerial judgment under uncertainty.

The fundamental challenge facing managers is how to make strategic decisions given the uncertainty of the future. One managerial response is the use of analogy, which reduces the effect of uncertainty by casting the unfamiliar in light of past experience (Gavetti, Levinthal, & Rivkin, 2005). Scholars have argued that analogy has many salutary effects: it facilitates strategic change by linking the past, present, and future (Kaplan & Orlikowski, 2013); it helps firms attain superior positions by rendering managers mentally flexible enough to see opportunities that are under-competed because they are difficult to perceive (Gavetti, 2012); and it provides the ability “to identify a superior course of action ... and foresee its consequences” (Gavetti & Menon, 2016: 207). In short, uncertainty triggers analogy, thereby enabling superior managerial judgment.

This argument would have seemed backward to Knight (1921), whose seminal distinction between “risk” and “uncertainty” rested on the limits of analogy. Knight argued that, if a thing behaved in a certain way under certain circumstances, then we could expect a similar thing to behave in a similar way under similar circumstances. The key question was: What things were like each other—what classes of things existed? To Knight, “uncertainty” stemmed from the fact that most things in the business world were unlike, thereby preventing the calculation of probabilistic “risk.” Although he acknowledged “degrees of uniqueness,” he wrote that most business decisions are effectively *sui generis* (1921: 231, 247), requiring skilled managers. To Knight, uncertainty signaled a shortage of analogy, thereby *necessitating* superior managerial judgment.

The purpose of this paper is to make a third argument: uncertainty, although it signals an insufficiency of analogy, can *stimulate* superior managerial judgment. To the extent that managers use analogy predictively (e.g., Gavetti et al., 2005: 693; Lovallo, Clarke, & Camerer,

2012: 496), they implicitly accept a conception of the future as singular and knowable—that is, if a past situation resembles a present one, they expect to see a similar outcome. But treating the future as plural and less knowable can, in theory, make managers more sensitive to changes in the present, reduce overconfidence in specific courses of action, and render mental models more flexible, thereby improving adaptability to whatever future does manifest. In other words, managers can profit by leveraging the uncertainty of the future (Schoemaker, 2002), which is epistemologically murky and ontologically plural.

That is the premise of strategic foresight methods like scenario planning (e.g., Schwartz, 1991; van der Heijden, 1996; Wack, 1985a, 1985b), where “strategic foresight” refers *not* to the ability to perceive a particular, beneficial future (cf. Gavetti & Menon, 2016), but rather to a process of thinking about the future so as to better sense, shape, and adapt to emerging events (e.g., Rohrbeck, Battistella, & Huizingh, 2015; Slaughter 1997/2002; Tsoukas & Shepard, 2004a). Despite widespread corporate adoption of tools like scenario planning (Rigby & Bilodeau, 2015), strategic foresight methods have struggled to find purchase in the general management literature (Rohrbeck et al., 2015) and therefore lack an agreed-upon theoretical justification (Bouhaleb & Smida, 2018). As one review noted: “Some attempts to build conceptual foundations can be observed, but in general, we found no single perspective that deserves loyalty on which a coherent theoretical foundation of strategic foresight is built” (Iden, Methlie, & Christensen, 2017: 87).

This gap is puzzling, harmful, and unnecessary. It is puzzling given the importance that scholars have long accorded managerial conceptions of the future (e.g., Fayol, 1916/1949). It is harmful because it impedes an understanding of whether, how, and under what conditions particular foresight methods might work. And it is unnecessary because the assumptions and

purported benefits of strategic foresight dovetail with the assumptions and requirements outlined in the literature on dynamic capabilities (Teece, Pisano, & Shuen, 1997). Like strategic foresight, that work is grounded in a recognition of Knightian uncertainty, and it holds that managers must be forward-looking in their ability to sense change, to seize opportunity, and to reconfigure assets so as to adapt to rapidly changing environments (Teece, 2007).

In this paper, I maintain that we may measure the degree to which strategic foresight aids the formulation of strategy under uncertainty by the extent to which it supports the “microfoundations” of dynamic capabilities (Teece, 2007). Specifically, strategic foresight will bolster sensing, seizing, and reconfiguring to the extent that it prompts managers to consider a range of alternative futures, thereby preventing them from prematurely settling on a focal hypothesis (Koehler, 1991). I draw on the heuristics-and-biases literature regarding judgment under uncertainty (e.g., Kahneman, Slovic, & Tversky, 1982) to develop theory about the workings of strategic foresight, and I draw on the dynamic capabilities literature to establish benchmarks for judging strategic foresight’s utility in making strategy under uncertainty. I therefore address the role of cognition in dynamic capabilities (Helfat & Peteraf, 2015) by linking research in psychology and strategy (Felin, Foss, & Ployhart) and blending individual- and firm-level analysis (Whetten, Felin, & King, 2009) in an attempt not simply to fill a gap in the literature, but to address the fundamental question of how to improve managerial judgment.

## **KNIGHTIAN UNCERTAINTY AND STRATEGIC RESPONSES: A REVIEW**

Even though, in its purest form, a predictable future would render humans mere automatons unwinding in a clockwork universe, humans find the uncertainty posed by the unknowability of the future so unnerving that we go to great lengths to avoid it. As Knight wrote,

“[W]e do strive to reduce uncertainty, even though we should not want it eliminated from our lives” (1921: 238). This section reviews strategies to reduce uncertainty and to show how those efforts, like Knightian uncertainty itself, reflect particular beliefs about the nature of the future.

### **Knightian Uncertainty**

In *Risk, Uncertainty and Profit*, Knight wrote: “The practical difference between the two categories, risk and uncertainty, is that in the former the distribution of the outcomes in a group of instances is known (either through calculation *a priori* or from statistics of past experience), while in the case of uncertainty this is not true” (1921: 233). Understandably, scholars therefore tend to characterize Knightian uncertainty as the inability to assign probabilities to a known set of possible outcomes,<sup>1</sup> as though the concept of Knightian uncertainty were simply a challenge to the neoclassical assumption that people are rational decision-makers with full information—“bounded rationality” (Simon, 1947) *avant la lettre* (Rakow, 2010). Knight certainly did intend to push back against the notion of *homo economicus* (Emmett, 2009), but this characterization neglects the deeper philosophical underpinnings of Knightian uncertainty.

To Knight, uncertainty stemmed from capitalism’s orientation toward the future—the fact that managers have to make bets about tomorrow without full knowledge of it: “At the bottom of the uncertainty problem in economics is the forward-looking nature of the economic process itself” (1921: 237). Because he saw business situations as largely *sui generis*, Knight argued that past experience precluded a clear look at the future, and as a result, managers had to exercise judgment—they had to form an opinion about “the future course of events” (1921: 233).

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<sup>1</sup> Some scholars also define Knightian uncertainty as the inability to imagine all possible outcomes (e.g., Alvarez, Afuah, & Gibson, 2018), but this view is less common among economists. For example, Zeckhauser (2006) has explicitly argued that Knightian uncertainty does not encompass the failure to imagine all future states of the world—a condition he dubs “ignorance.”



Economic competition was therefore a struggle among such opinions, and profit stemmed from the fact that some were more accurate than others.

Embedded in this analysis are beliefs about epistemology (how much we can know about the future), ontology (whether the future is single and predetermined or plural and undetermined), and human agency (the extent to which we can control or even create the future). Knight believed that the universe was fundamentally indeterminate and therefore that the future was opaque (Foss, 1993). This indeterminateness was not only the result of randomness, but a function of human consciousness, which, as Boudreaux and Holcombe put it, “severs any rigid connection between the present and the future” (1989: 145). In other words, free will gave people the ability to shape the future: “Knight emphasized human creativity in an economic universe that is basically open-ended in its possibilities” (Foss, 1993: 270).

Uncertainty was therefore not simply a function of capitalism, it was essential for capitalism to function. Knight argued that, if all outcomes were probabilistically knowable, profits would be competed away because the optimal course of action would be apparent to all. Firms could operate on autopilot: “[I]n a world so built that perfect knowledge was theoretically possible, it seems likely that all organic readjustments would become mechanical, all organisms automata.” With the introduction of uncertainty, however, the chief questions became “what to do and how to do it” (1921: 268).

### **Responses to Uncertainty**

Various approaches to strategy address these questions differently, but all share the objective of reducing uncertainty. Consider the following three strategic approaches to uncertainty—planning, learning, and enacting—and the philosophical assumptions of each.

**Planning.** The planning approach to strategy contends that firms are best served by formalized, rational processes that articulate long-term objectives and the means to achieve them (Ansoff, 1965). As Chandler wrote: “Strategy is the determination of the basic long-term goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals” (1962/2013: 13). The planning approach takes an epistemologically aggressive view of the future, treating it as relatively predictable. After all, if there were no predictability to the future, plans would serve no purpose.

Amid the relative economic stability of the 1950s and 1960s, many firms developed large planning and forecasting units to maximize efficiency and control (Galbraith, 1967)—an effort that jibed with the notion that an organization should operate mechanistically amid relative placidity (Burns & Stalker, 1961/1994). Indeed, the planning approach could be seen as an extension of Taylor’s scientific managerialism (1911), which had resurged after World War II as an outgrowth of operations research, statistical methods the Allies had used successfully to optimize military tactics (Ansoff, 1965). As Barley and Kunda wrote of the rationalist zeitgeist, “Planning, forecasting, and controlling were to be the manager’s watchwords” (1992: 377).

**Learning.** In contrast, advocates of the learning school contended that prediction was a “fallacy” that assumed the world would “hold still while a plan is being developed and then stay on the predicted course while that plan is being implemented” (Mintzberg, 1994: 110)—a criticism that became more salient as environmental turbulence increased in the 1970s (Grant, 2003). Instead, they focused on the present, when the future had made itself known. Their favored strategy was thus one of adaptability through short-term feedback and incremental response. Taken to its logical extreme, such a strategy was no strategy at all, but rather ad hoc improvisation (Mintzberg & McHugh, 1985) or simple serendipity (Pascale, 1984).

The prescriptions of the learning school mesh with the predictions of organizational scholars. Cyert and March emphasized that firms “avoid the requirement that they correctly anticipate events in the distant future by using decision rules emphasizing short-run reactions to short-run feedback rather than anticipation of long-run uncertain events” (1963: 167). Weick (1969) wrote that organizations make decisions “in terms of localized disturbances to which abbreviated analyses will be applied, with short-term recommendations as the result.” Lawrence and Lorsch (1967) noted that if an organization is getting constant feedback from a turbulent environment, it will focus on the short term and its search will be local. In the literature on exploration versus exploitation, which may be read as a contest between future needs and present competencies, exploitation dominates because its “returns are positive, proximate, and predictable,” whereas the wages of exploration are “uncertain, distant, and often negative” (March, 1991: 85).

**Enactment.** The planning and learning approaches to strategy thus differ largely along epistemological lines. What firms do depends on how much they think they can know. Yet future uncertainty is also a matter of ontology. Is there only one future, or are there multiple possible futures? Is the future predetermined, or can firms influence it? To the extent that firms have influence, are they simply choosing among preexisting alternatives, or can they create options? Both the planning and learning schools imply a monistic view of the future, in which firms position themselves in the strategic landscape but have little ability to construct it (Wiltbank, Dew, Read, & Sarasvathy, 2006). This conception leaves no room for entrepreneurship (Felin, Kauffman, Koppl, & Longo, 2014), but, as Schumpeter (1911) argued: “Passively ‘drawing consequences’ is not the only possible economic behaviour. You can also try and change the given circumstances.” Firms, we might say, are not simply “future takers”; they are also “future

makers.” Entrepreneurs create rather than simply discover possibilities (Alvarez & Barney, 2007) and therefore can enact their environment (e.g., Hamel & Prahalad, 1994).

### **Residual Uncertainty**

Firms need not pursue these strategies in pure form—hence Mintzberg and Waters’ argument that strategy should be both “deliberate” and “emergent” (1985)—but each has its flaws. Successful long-term planning requires accurate prediction (Makridakis, 1996), but long-term prediction is difficult in complex domains (Tetlock, 2005), such as business, where the determinants of performance are poorly understood (Rosenzweig, 2006) and the rapid feedback that enables learning (Kahneman & Klein, 2009) is elusive. Adaptation thrusts the firm into a reactive posture (Brown & Eisenhardt, 1998), leaving it vulnerable to “predictable surprises” (Bazerman & Watkins, 2008) and “success traps” (Levinthal & March, 1993), whereby it efficiently produces widgets but is vulnerable (and possibly blind to) the next widget-usurping innovation that comes along. Meanwhile, enactment requires the ability both to predict and to adapt: a firm must accurately forecast its ability to shape the future while preparing to adapt to the parts of the future it cannot or does not try to shape.

Which raises a fundamental problem: no strategy can eliminate uncertainty. Indeed, to the extent that a firm reduces, or avoids, or controls uncertainty, it is not actually addressing Knight’s challenge of how to make strategy under uncertainty. This point might seem to risk tautology—that is, any strategy that successfully manages uncertainty cannot, by definition, be a strategy for dealing with uncertainty—but no matter how successful a firm is in planning, or adapting, or enacting, it will face some amount of residual uncertainty.

We thus return to Knight’s original questions: “what to do and how to do it” (1921: 268). That is, how do firms make strategy under uncertainty given the need for managerial judgment?

These were questions for which Knight himself had no answer. Management, he wrote, was an “art” not a “science,” and given the opacity of the future, strategy was a “delusion” (1923: 24). The sources of good judgment, meanwhile, were hopelessly opaque—“a part of the scientifically unfathomable mystery of life and mind” (1921: 227).

Modern scholars have tried to be more constructive. Foss and Klein, for example, have hypothesized that “judgment is rooted in *skills* for handling uncertainty” (2012: 80-81), noting that “skills are, of course, accumulated through experiential learning” (2012: 94). It is therefore fitting—though ironic, given Knight’s definition of uncertainty—that one of the more robust literatures on cultivating managerial judgment touts the benefits of analogizing from experience.

### **THE PROMISE AND PERIL OF ANALOGIES, REAL AND IMAGINED**

Analogy is often considered the foundation of human cognition, the “fuel and fire of thinking” (Hofstadter & Sander, 2013). The comparison and categorization of experiences is the fundamental way in which we make sense of uncertainty, and Knight himself agreed that “all reasoning rests on the principle of analogy” (1921: 204). Without analogy, every situation would be utterly novel, giving us no sense of what to expect next.

This predictivity is a core function of analogy. As Hume put it, “From causes which appear similar we expect similar effects” (1748). The more precise the analogy, the greater the foresight it ostensibly affords: “There can be no doubt that every resemblance affords some degree of probability, beyond what would otherwise exist, in favour of the conclusion” (Mill, 1843). In theory, then, analogical reasoning is probabilistic—the greater the similarity between two situations, the more likely their outcomes will be the same—which is why scholars of analogy stress the importance of finding analogies with deep structural similarities (e.g., Gentner,

1983). But individuals are not intuitive statisticians (Kahneman & Tversky, 1973), and they tend to use a single analogy to generate a single course of action (Dubin & Lovallo, 2008).

The purpose of this section is to critically examine the use of backward-looking analogies (i.e., those derived from experience) as a tool for improving managerial judgment, while suggesting that forward-looking analogies (i.e., those constructed by imagination) may be useful.

### **Experience as a Source of Judgment**

Analogy has become central to the study of management, both because it is thought to describe how managers actually make decisions and because it is thought to describe how they should make decisions (Gavetti et al., 2005).

From a descriptive standpoint, analogy is how managers make sense of novel and complex situations: “[W]hen faced with a new and complex setting, managers identify the features of the setting that seem most pertinent, think back through their experiences in other settings with similar features, and recall the broad policies that worked well in those settings” (Gavetti et al., 2005: 693). This description has several noteworthy characteristics. First, analogy operates through simplification: managers identify the underlying characteristics of the situation that are most germane, which enables them to bring a complex situation within the bounds of managerial cognition. Second, it is backward-looking: managers comb history—whether their own experiences or those of others—to determine a putatively apt comparison to the present situation. Third, analogy is predictive: if managerial actions taken in the past turned out well, similar actions in the present are expected to do the same.

The normative case for analogy rests on this last point. Simulations have shown that analogies with the greatest fidelity between past and present yield the best performance (Gavetti

et al., 2005: 708). Good analogy not only provides an accurate model of the strategic landscape—thereby improving performance (Gary & Wood, 2011)—but it also renders managers mentally flexible enough to recognize “cognitively distant” opportunities that are under-competed because they are difficult to perceive (Gavetti, 2012: 269). Analogies enable managers to “change their worldview” (Gavetti, 2012: 269) so that they can see superior opportunities—superior opportunities being complex and therefore difficult to deduce via first principles (Rivkin, 2000) but easier to see via associative reasoning. Finally, analogy provides the ability “to identify a superior course of action ... and foresee its consequences” (Gavetti & Menon, 2016: 207). Strategists who can determine why past situations produced success may generate insights that they can apply to a present situation (Gavetti, 2012). Thus, uncertainty prompts analogy, which improves managerial judgment.

From a Knightian perspective, however, analogy cannot be a solution to uncertainty because uncertainty is defined as the absence of analogy. Granted, Knight said that few situations were entirely unique or entirely common: situations of true risk are rare because “entirely homogenous classification of instances is practically never possible,” and conversely instances of true uncertainty are rare because “it probably never happens that there is no basis for comparison” (1921: 227). The distinction between “risk” and “uncertainty” is “a matter of degree only” (1921: 227). Nevertheless, he did not believe that such similarities alone could form the basis for anticipating the future. That demanded judgment.

Even if one sets aside Knight’s particular definition of uncertainty, the nature of managerial problems undercuts arguments in favor of analogy. For example, it is unclear how analogy can serve as a method for understanding “novel” situations, given that something new, by definition, lacks antecedent. Even if we relax our definition of “novel”—and acknowledge

“degrees of uniqueness”—we are left with the problem of “complexity.” Analogy entails simplification, but difficult-to-imitate courses of action are complex (Rivkin, 2000), making it hard to see how analogy can lead to superior strategy. And if the world is becoming ever more volatile, uncertain, complex, and ambiguous (Schoemaker, Heaton, & Teece, 2018; Stiehm, 2002), this problem will only become more salient. Ironically, as the world becomes less like the way it was, we will find ourselves drawing ever more comparisons with the past. Finally, the more turbulent the environment, the more important the ability to switch mental models rapidly in order to keep pace with reality. Analogy is not well-suited to this need: although analogies are characterized as a means to more flexible mental models (Gavetti, 2012), they are, in fact, incredibly sticky, persisting even in the face of disconfirming evidence (Vinokurova, 2012). Analogies may not only be wrong, they may be persistently wrong.

To be fair, proponents of analogy urge caution. For example, Gavetti and Rivkin (2005) write, “Dangers arise when strategists draw an analogy on the basis of superficial similarity, not deep causal traits.” But analogizing on the “right” dimensions of a problem is far more difficult than generally recognized. For one thing, there is too little past experience—that is, history—on which to draw, and our familiarity with it is limited. The more uncertain a situation—that is, the greater the “degrees of uniqueness”—the greater the demand for analogy, but the smaller the supply. As March and colleagues put it, “[T]he paucity of historical events conspires against effective learning” (March, Sproull, & Tamuz, 1991: 1). The difficulty in determining causality further impairs the ability to learn from experience. One cannot re-run past events to test hypotheses under controlled conditions (Shafer, 1980), so we are faced with the “ambiguities of experience” (March, 2010). Finally, history is highly contingent, undergoing sudden phase changes for seemingly minor reasons with surprising results (Ferguson, 2010). In the past there



were multiple possible futures, many of which were separated by the thinnest of circumstantial membranes (Cowley, 2000; Ferguson, 1999). We simply live in the past future—that is, the present—that happened to manifest. To be truly useful, then, an analogy would therefore have to account for the fidelity not only between the past and the present, but between the past’s possible futures and the present’s possible futures (March et al., 1991)—an impossible task.

That said, discarding analogy as a managerial tool would seem both infeasible (humans reason analogically) and undesirable (absent comparison to past experience, every situation would be novel). How, then, can managers leverage analogy’s utility while avoiding its pitfalls?

### **Imagination as a Source of Judgment**

Part of the problem is that executives tend to base their thinking on a single analogy (Gavetti et al., 2005)—a tendency that has been replicated in laboratory studies (Dubin & Lovallo, 2008)—so one solution might be to prioritize a *breadth* of analogies, as opposed to the *depth* of a single analogy. True, if uncertainty is marked by the absence of analogy, then demanding multiple analogies as the solution to the problem with single analogies is nonsensical. But analogies need not come only from experience of past events; they may also come from imagination of future situations. That is, the way to reconcile the problem with analogies may lie not in unearthing better ones but in constructing more of them. As March has noted, in order to learn from “samples of one or fewer” (March et al., 1991), it is “probably necessary to supplement the data of history with the data of virtual experience” (March, 2010: 117).

Admittedly, “supplementing the data of history” requires us to accept that learning can be a function of imagination, and organizational scholars have traditionally seen learning as a function of environmental feedback (e.g., Cyert & March, 1963) or experience (e.g., Levitt &

March, 1988). But much of what we learn from experience is, in fact, a function of imagination—of considering counterfactuals—because only by asking what the world would look like if a certain event had not happened are we able to determine whether it made a difference (Tetlock & Belkin, 1996).

If learning from experience is based on imagination—on the construction of alternative pasts—then it is not unreasonable to think that we may also learn from imagined futures. Indeed, as Seligman and colleagues have written, it may be prospection—the ability to envision alternative futures—that enables wisdom (Seligman, Railton, Baumeister, & Sripada, 2016). Humans routinely engage in “mental time travel,” a process by which we not only consciously recall past events, but also project ourselves into the future (e.g., Suddendorf & Cornballis, 2007). Neuroscientists have found “striking similarities” between the brain’s mechanisms for remembering the past and for imagining the future (Schacter et al., 2012: 677). For example, one study found that subjects with memory loss due to hippocampal damage also had difficulty describing potential futures, suggesting a link between the way the brain processes experience and imagination (Hassabis, Kumaran, Vann, & Maguire, 2007).<sup>2</sup> And children only develop the ability to imagine futures once they have developed the ability to remember experiences (Busby & Suddendorf, 2005).

Just because the brain conceives of the past and the future in similar ways does not necessarily mean that we can learn from an imagined future. But the purpose of thinking about the future is to change motivation and behavior in the present (Suddendorf, 1994). Indeed, from an evolutionary standpoint, the ability to mentally construct futures and adapt accordingly may

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<sup>2</sup> Interestingly, Knight foreshadowed these findings when he wrote, “Prophecy seems to be a good deal like memory itself, on which it is based” (1921: 211). He also noted the similarity between real and imagined experience: “Scientifically, we can analyze the mental content into sense data and imagination data, but the difference hardly exists for consciousness itself, at least in its practical aspects” (1921: 203).

account for human survival and flourishing as a species (Dawkins, 2000). Brain imaging shows that, in constructing visions of the future, humans recombine elements from memories to fashion something new (Schacter, Addis, & Buckner, 2007). We can then “backcast” to ascertain possible causes of that future, based on our existing mental models of how the world works. In doing so, we may change what we see and do in the present. Differences between what we expect to see and what we actually do see—that is, errors in expectation—enable learning (Seligman et al., 2016), which is to say new mental models. The new experiences and the changed mental models in turn enable us to hypothesize different alternative futures, forming a mind-expanding feedback loop (Suddendorf & Busby, 2003).

The idea that we can learn from imagined futures is not alien to management scholars. If we learn, in part, through trial and error, then imagined futures can be considered a sort of “ideational trial and error” (Felin & Zenger, 2009: 133). This is similar to the point Gavetti and Levinthal (2000) make about the strategic value of “cognitive search.” Building on Emirbayer and Mische’s writing about the sources of agency (1998), Kaplan and Orlikowski explain: “[T]he future is not a set of outcomes that can be forecast more or less accurately or that will be revealed over time. Instead, the future is manifest in the multiple imaginings of what might be possible” (2013: 966). Those multiple imaginings, in turn, render us more cognitively agile, able to adapt to the future that does manifest (Weick & Sutcliffe, 2015).

Nor is the notion alien to business. Herman Kahn, a Cold War defense intellectual who noted that the revolutionary nature of nuclear weapons made it difficult to reason by historical analogy, pioneered the use of imagined futures to inform strategy (Kahn, 1960; Kahn, 1965). Kahn’s answer was to create “ersatz experience” (Kahn, 1966/2009) via “strange aids to thought” (Kahn, 1960), like scenarios that could serve “as artificial ‘case histories’ and

‘historical anecdotes’ ... to make up to some degree for the paucity of actual examples” (Kahn, 1966/2009: 195). The use of scenarios then jumped to business (Fosbrook, 2018) in the early 1970s via Kahn’s contact with Pierre Wack, a Royal Dutch/Shell executive, who used scenarios to explore the potential for major changes in the Arab world, a process that ostensibly enabled Shell to survive the 1973 oil price shocks (Kleiner, 2008; Wack, 1985a, 1985b). This marked the birth of scenario planning as a strategic tool for managers.

Despite this lineage, scenario planning—the formalized process of generating and considering scenarios—lacks theoretical grounding. Much like strategic foresight, of which it is an example, scenario planning has received little attention in the general management literature (for reviews, see Chermack, Lynham, & Ruona, 2001; Varnum & Melo, 2010), and some of that attention concerns method not theory (Schoemaker, 1995; Lempert et al., 2006). The few scientific studies of scenario planning disagree markedly about its effects, particularly whether it increases or decreases overconfidence (Kuhn & Sniezek, 1996; Meissner & Wulf, 2013; Phandis, Caplice, Sheffi, & Singh, 2015; Schoemaker, 1993; Tetlock, 2005: Chapter 7). The paucity of theory regarding scenario planning—and strategic foresight generally—makes it difficult to generate testable hypotheses and produce knowledge. Indeed, given its similarity to analogy, there is reason to believe that it might suffer the same flaws. What we need is a theoretical framework by which to judge strategic foresight methods.

## **THEORIZING ABOUT ANALOGY AND STRATEGIC FORESIGHT**

In this paper, I argue that strategic foresight tools will aid the formulation of strategy under uncertainty by the extent to which they support the microfoundations of dynamic capabilities. Specifically, I theorize that they will do so to the extent that they facilitate an open and pluralistic

conception of the future—an ability that can be highlighted via contrast with analogy, which encourages a more closed and monistic conception of the future. In order to make this argument, I must first address why the consideration of multiple futures would be superior to a single future, especially given that a tool, like scenario planning, relies on the same mechanism as analogy—the comparison of like events (real in the case of analogy, and imagined in the case of scenario planning). In this section, I address that puzzle by proposing theory about the weaknesses of analogy and the strengths of strategic foresight.

### **The Psychological Basis of Analogy**

The use of analogy can encourage a mental model that persists in the face of evidence to the contrary (Vinokurova, 2012), and poor mental models undermine effective strategy (e.g., Tripsas & Gavetti, 2000). We can find one explanation for this effect in the work on heuristics and biases (e.g., Kahneman, Slovic, & Tversky, 1982; Kahneman, 2011), which suggests that analogies evoke many biases that degrade judgment (cf. Bazerman & Moore, 2013: 219-221).

Chief among these may be explanation bias (Ross, Lepper, Strack, & Steinmetz, 1977), which holds that, when individuals are asked to explain an outcome, they come to believe it is more likely. Koehler (1991) explains the mechanism behind this phenomenon, arguing that the explanation becomes a “focal hypothesis” that triggers an assumed-to-be-true frame of reference, whereby disconfirmatory evidence is ignored or given less weight than data that supports the hypothesis. I suggest that the process of generating analogy triggers explanation bias in managers because the purpose of comparing the present to the past is to identify and justify a course of action. The analogy thus becomes a focal hypothesis, and overconfidence—a pervasive judgmental bias (Moore & Healy, 2008)—increases as the plausibility of the hypothesized

analogy is backed up by ostensibly confirming evidence that may or may not have diagnostic value (e.g., Wason, 1960). What's more, a decision maker searching for an analogy may rely on ease of recall—that is, it may trigger availability bias (Tversky & Kahneman, 1973). Managers may settle on analogies that are more notable for standing out than they are for holding up, meaning that both the inductive process of analogy-generation and the deductive process of hypothesis-testing are biased.

Another way of looking at analogy would be to say that analogists fall prey to the representativeness heuristic, substituting the judgment that one situation *resembles* another for the judgment that one situation *is like* another—and therefore will behave similarly—even if, in doing so, they privilege dubious evidence or commit statistical sins, such as ignoring base rates (Kahneman & Tversky, 1973; Kahneman & Frederick, 2002; Kahneman, 2011). Indeed, situations of Knightian uncertainty epitomize the law of small numbers (Tversky & Kahneman, 1971). By definition, a unique situation is not representative of a larger population, yet managers often use a single point of comparison in the past to infer the likelihood of a particular future. Similarity is not irrelevant, but analogy degrades judgment insofar as it substitutes an easier question (“Does this business look like a successful business?”) for a harder one (“Will this business succeed?”). As Steinbruner (1974: 115) has argued, analogy is a device by which decision-makers substitute simple comparisons for complex problems.

Analogy to past experience also triggers hindsight bias (Fischhoff & Beyth, 1975) and takes advantage of the human penchant for narrative. Using historical analogy, we infer a detailed story about the future, even though each of those details, while making the story more plausible, makes it less probable because it involves a greater number of factors that must happen in conjunction (Kahneman & Tversky, 1983; Tversky & Kahneman, 1982). “Adding details to a

good story increases plausibility, yet at the same time decreases probability” (Koehler, 1991: 510). Historical analogy magnifies the effect of “outcome knowledge.” As Tetlock and Belkin write, “Once people learn the outcome of an event, they not only perceive that outcome as more likely ex post than they did ex ante...they often fail to remember their ex ante assessment of what was and was not likely to happen” (1996: 15). The past comes to be seen as inevitable (March, 2006: 208), and the future comes to be seen as predictable (Kahneman, 2011: 218).

Some scholars maintain that emphasizing the need for structural similarity in analogies can offset certain cognitive biases, such as availability (Gavetti & Rivkin, 2005). Yet, logically speaking, the better the analogy, the stronger the focal hypothesis and the weaker the search for disconfirmatory evidence. Trying to debias by carefully considering a single analogy may, ironically, exacerbate the problem.

### **Strategic Foresight as Antidote**

I theorize that strategic foresight methods may improve judgment under uncertainty because, by encouraging consideration of multiple futures, they disrupt the tendency to prematurely settle on a focal hypothesis. This is the same logic behind the debiasing effects of “considering an alternative” (Fischhoff, 1982). As Soll, Milkman, and Payne note: “[O]ne of the most successful debiasing techniques for tackling narrow thinking is to instruct people to look at a problem they face in another way”—that is, to “think of the opposite” or to “look at it differently” (2014: 931). This body of research shows that entertaining multiple possibilities can reduce overconfidence and hindsight bias, both of which I have implicated in the problems with analogy. Perhaps most importantly, as Koehler (1991) has argued, considering an alternative breaks the “inertia” prompted by adopting a particular frame of reference, thereby renewing the

search for disconfirmatory information. Per Hirt and Markman, the act of considering an alternative forces individuals to “undo their prior explanation for the event and construct an explanation supporting a different outcome,” opening them to plausible alternatives and to evidence that might support those alternatives (1995: 1071).

There is also research that adds a temporal dimension to the consideration of alternatives—most notably, the work on counterfactuals (for reviews, see Epstein & Roese, 2008; Roese & Olson, 1995). Although Kahneman and Tversky (1982a) considered the simulation heuristic a bias and although research shows that counterfactual thinking can exacerbate certain judgmental errors, such as hindsight bias (Roese & Olson, 1996), other work has found that considering counterfactuals can reduce confirmation bias by making individuals aware of alternatives. Notably, Galinsky and Moskowitz (2000) found that, when asked to judge whether an individual was an extrovert, subjects primed to consider counterfactuals asked more hypothesis-disconfirming questions. Extending this finding, Kray and Galinsky (2003) found that priming counterfactual thinking encouraged the search for disconfirmatory evidence and improved subsequent decision quality in the Carter Racing case (Brittain & Sittkin, 1986), which is based on the Space Shuttle Challenger disaster. Although the literature on considering alternative futures is smaller, it too finds that considering alternatives can improve judgment, by reducing overconfidence (Hirt & Markman, 1995; Hirt, Kardes, & Markman 2004).

A different, but complementary, line of research finds that considering a breadth of analogies improves judgment by encouraging managers to take the “outside view” instead of the “inside view.” Whereas the inside view encourages individuals to treat each situation as unique, the outside view encourages them to consider their situation as an example of a broader class of similar situations (Kahneman & Lovallo, 1993). This more statistically grounded approach



prompts more accurate predictions (e.g., of the time it will take to complete a project) than the inside view, which encourages excessive optimism and overconfidence—a dynamic that extends to strategy-making. In one study, Lovallo and colleagues found that private equity investors who generated a reference class (Kahneman & Tversky, 1982b) of analogous cases (Gilboa & Schmeidler, 1995) were better able to take the outside view and, as a result, generated superior returns (Lovallo et al., 2012). Other research has shown that use of multiple analogies improves predictive accuracy (Green & Armstrong, 2007), and that better forecasters search out analogies that disconfirm as well as confirm their hypotheses (Tetlock, 2005: 92).

### **Constraints on the Future**

Theorizing that any simulation of multiple futures offsets the judgmental biases inherent in analogy would be simplistic. An “anything could happen” approach to the future is neither accurate (there are things that can be predicted, and there are constraints on the possible), nor useful (simply positing that “anything could happen” does nothing to bound uncertainty nor to increase adaptability in the face of residual uncertainty).

In fact, considering an overabundance of futures can backfire. Given the task of generating explanations for hypothetical future events (Hirt & Markman, 1995; Hirt, Kardes, & Markman, 2004), subjects who were asked to generate two alternatives displayed less bias, but those asked to generate eight displayed more. The ease of generating two alternatives implied that there were plausible alternative outcomes, whereas the difficulty of generating eight implied the implausibility of alternatives, thereby reinforcing the focal hypothesis and increasing overconfidence. (A similar biasing effect occurs when subjects are asked to generate many explanations for counterfactual events [Sanna, Schwartz, & Stocker, 2002].) What’s more, Hirt

and Markman found, “Participants asked to explain subjectively plausible alternative outcomes showed debiasing, whereas those asked to explain subjectively implausible alternative outcomes maintained their belief in the focal hypothesis” (1995: 1084). Thus, a theory of strategic foresight requires more granular treatment of how to consider the future.

One idea is that the future may be ontologically open but epistemologically closed—which is to say, there may be many possible futures but they are limited by facts. This idea draws on Searle’s notion of social ontology (1995), whereby meaning has both a subjective and an objective component. For example, although the nature of a \$20 bill is ontologically subjective (i.e., it has value only because people believe it has value), it is an objective fact that it can be traded for goods and services (Searle, 2006). The notion that we can “learn from the future” has a whiff of the fantastical about it. But, contra some popular accounts, scenarios are not useful if they are “crazy” (*The Economist*, 2019). In constructing futures, we must defer to reality.

The notion that the future is simultaneously open and closed can also be found in the “adjacent possible” (Kauffman, 2000), a concept that entrepreneurship scholars have borrowed from biology to illustrate where new ideas come from. Biologists explain novelty in part as a function of random mutations that are selected for their fit with the environment. But, as Felin and colleagues (2014) explain, organisms may evolve characteristics that are not necessary adaptations to the environment but that nonetheless turn out to be useful. For example, the lungfish developed the swim bladder, which helps it maintain buoyancy, because water entering the fish’s lungs prompted a biological response. Importantly, the lungfish did not need the ability to regulate buoyancy; rather, the bladder’s functionality became apparent only *after* its appearance. The key here is that, although the swim bladder’s utility existed a priori, it could not have been anticipated—and that its development was constrained by the nature of the organism

and its environment. It constituted an adjacent possibility, a function of both variation and constraint. Randomness is not unrestricted but rather “highly canalized” (Felin et al., 2014: 277).

One can apply this notion of possibility and constraint to objects, organizations, and—for the purposes of this paper—the future itself. It is obviously not possible to state all potential future states of the world a priori. Yet the present will only evolve—or, given human agency, be pushed—into spaces that are nearby, even if they cannot be identified in advance. As Johnson summarized: “The adjacent possible is a kind of shadow future, hovering on the edges of the present state of things, a map of all the ways in which the present can reinvent itself.... [It] captures both the limits and the creative potential of change and innovation” (2010: 31). Strategic foresight methods are managerial tools for exploring the adjacent possible, with a respect for reality defining the canals that guide thought.

## **STRATEGIC FORESIGHT AS DYNAMIC CAPABILITY**

One theoretical tool for understanding how firms maintain competitive advantage amid rapid change—that is, how they make effective strategy under uncertainty—is the literature on dynamic capabilities (Teece et al., 1997), which maintains that, in high-velocity environments, firm performance does not rest solely on the possession of difficult-to-imitate assets, as maintained by the resource-based view of the firm (Penrose, 1959; Wernerfelt, 1984) but rather the ability to reconfigure those assets (Teece et al., 1997). A dynamically capable firm is both responsive to its current environment (Helfat et al., 2007) and forward-looking (Teece, 2007), investigating the future and attempting to shape it (Teece, Peteraf, & Leih, 2016). Specifically, dynamic capabilities to cope with the emerging future rest on three microfoundations: sensing, seizing, and reconfiguring (Teece, 2007).

Therefore, I argue that we may measure the degree to which strategic foresight tools enable strategy under uncertainty by the extent to which they support the microfoundations of dynamic capabilities. Further, I maintain that such tools will do so by the extent to which they support a pluralistic conception of the future. Contra analogy, which recommends a specific course of action, strategic foresight does not indicate *what* to think but, rather, *how* to think. This distinction echoes the argument that dynamic capabilities do not by themselves constitute firm strategy but that they must be congruent with it (Teece et al., 2016: 18; Schoemaker et al., 2018: 18). Indeed, dynamic capabilities lend themselves to a theoretical framework for strategic foresight both because they, too, are grounded in a recognition of Knightian uncertainty (Teece et al., 2016: 15) and because, in a case of supply meeting demand, the purported benefits of strategic foresight (attuning managers to their environment, reducing overconfidence in specific courses of action, and rendering mental models more flexible) match the needs of dynamic capabilities (sensing, seizing, and reconfiguring).

Taking each microfoundation in turn, in this section I first establish that we can consider strategic foresight a dynamic capability. Because that confluence alone is not a sufficient basis for asserting strategic foresight's utility, I then use the theoretical arguments from the previous section to show how the debiasing effects of considering multiple futures could strengthen the firm's ability to sense, seize, and reconfigure. I also raise potential limits to strategic foresight that become apparent when viewing it as a dynamic capability.

**Sensing.** The first microfoundation of dynamic capabilities is the ability to *sense* opportunities and threats in the environment, requiring “perception” and “attention” (Helfat & Peteraf, 2015: 838), which dovetails with strategic foresight's emphasis on developing “peripheral vision”—the ability to better sense impending change in uncertain environments

(Day & Schoemaker, 2004; Day & Schoemaker, 2005). In fact, Tsoukas and Shepard define strategic foresight largely in terms of sensing: it is “the organizational ability to read the environment—to observe, to perceive—to spot subtle differences” (2004b: 140). And dynamic capabilities scholars themselves have noted: “Scenario planning can aid generative sensing. It can be an important internal tool for managing uncertainty and facilitating rapid response to new exigencies” (Teece et al., 2016: 22).

We may therefore say that strategic foresight aids strategy-making under uncertainty when it improves sensing. And, using insights from the heuristics-and-biases literature, we may theorize that it does so by embracing a pluralistic conception of the future: when managers consider alternative futures, they are more likely to seek out disconfirmatory evidence. Seen another way, considering alternative futures prompts managers to take the outside view, which exposes them to a broader class of events.

At the same time, ontological pluralism might constrain sensing. Considering too many futures can not only encourage reversion to a focal hypothesis as discussed earlier, it can also result in a deluge of information and organizational neurosis (Day & Schoemaker, 2005). There is also evidence that decomposing even two distinct alternative futures—that is, considering the many paths by which one might reach mutually exclusive outcomes—can backfire, as explanation bias over-inflates probability estimates (Tetlock, 2005: Chapter 7). From an organizational point of view, managers may disagree about what constitutes a “plausible future,” and, as Kahneman has said, “The impossible sometimes happens and the inevitable sometimes does not” (as quoted in Tetlock, 2005: 189). Finally, managers cannot watch for things they have not thought of. This is why Neustadt and May wrote: “The future may surprise. It surprises because something in the present, hard to see, weakens the past as a guide” (1986: 261).

Unfortunately, our ability to recognize the future import of current events is limited (Risi et al., 2019). We see many inflection points that do not exist and miss many that do.

**Seizing.** The second microfoundation of dynamic capabilities is *seizing*, the ability of firms to take advantage of nascent opportunities, which requires flexibility in physical plant and organizational structure. Like sensing, seizing is commensurate with the goals of strategic foresight generally and scenario planning specifically. Wack, the Shell scenario planner, wrote that the consideration of scenarios was intended to cultivate an entrepreneurial mind-set and invigorate managerial recognition of “strategic openings” (1985b: 150). Just as Knight argued that uncertainty was a precondition for entrepreneurship, Wack wrote: “Scenario planning aims to rediscover the original entrepreneurial power of foresight in contexts of change, complexity, and uncertainty. It is precisely in these contexts—not in stable times—that the real opportunities lie to gain competitive advantage through strategy” (1985b: 150).

We may say that strategic foresight aids strategy-making under uncertainty to the extent that it encourages seizing, and we may theorize that it does so by making alternative futures more salient, mitigating availability bias and reducing overconfidence in the likely success of any given plan. Additionally, by encouraging them to take the “outside view,” the consideration of multiple futures helps managers avoid the pitfalls of the “planning fallacy,” whereby individuals tend to underestimate the time and cost of projects (Buehler, Griffin, & Ross, 1994).

Companies that have considered an array of futures are less likely to lock themselves into single, possibly difficult-to-reverse, courses of action. Indeed, strategic foresight enables managers to better navigate the nonlinear relationship between the uncertainty of the future and the irreversibility of decisions (Ghemawat, 2016). The challenge of seizing lies in identifying the best course of action. Although strategic foresight can give firms a greater awareness of

possibilities, managers nevertheless need to commit to organizational structures and invest in capabilities. Because strategic foresight does not purport to be predictive, it emphasizes adaptability, but adaptability has its limits, which is why Mintzberg and Waters (1985) noted that strategy must be both “deliberate” and “emergent.” Strategic foresight reduces but does not necessarily resolve the tension of those competing demands and may therefore need to be supplemented with a more concrete approach, such as that presented by real-options theory (for a review, see Trigeorgis & Reuer, 2017).

**Reconfiguring.** *Reconfiguration* is the ability to recombine assets and restructure the organization so as to match the environment (Teece, 2007). As Helfat and colleagues (2007) point out, reconfiguration requires managers to reorganize both the firm’s tangible and intangible resources. Such “asset orchestration,” in turn, can require the ability to persuade managers to change the way they see the world, an effort that may encounter resistance (Helfat and Peteraf, 2015). The ability to shift one’s mental models—and those of others—is another of the purported benefits of scenario planning. As de Geus, a Shell scenario planner, put it: “[T]he companies that succeed will be those that continually nudge their managers towards revising their views of the world” (1988: 74). Wack characterized his early efforts at scenario planning as exercises in changing the managerial “microcosm” (1985b: 140).

We may thus gauge the utility of strategic foresight by its ability to unstick mental models, and we may theorize that it does so by discouraging the premature adoption of a focal hypothesis and the consideration of disconfirmatory evidence—by breaking the “inertia” that Koehler (1991) described via consideration of alternative futures. Indeed, managers who embrace strategic foresight’s fundamental premise—that the future is marked by irreducible

uncertainty—should display less overconfidence in their existing mental models. But that is a proposition that requires further study.

We must also consider the organizational determinants of foresight’s ability to shift mental models. On the one hand, the interactive nature of strategic foresight exercises like scenario planning may facilitate strategic change, providing a social mechanism for doing the “temporal work” that can help resolve differences among organizational actors (Kaplan & Orlikowski, 2013), for resolving the cognitive and political competition among strategic frames that occurs in times of uncertainty (Kaplan, 2008), and for providing the social interaction that can fuel the origination of novel strategies (Felin & Zenger, 2009). On the other hand, managers can conduct foresight exercises in such a way as to reinforce an organizationally predetermined outcome. Ideally, strategic foresight tools serve as “liberating structures” (Torbert, 1991), encouraging low-risk exploration of potential strategies. But strategic foresight can run aground if a particular future is central to an organization’s identity or managerial agenda. Zenko (2015) recounts the U.S. military’s Millennium Challenge exercise, a war game that officials conducted so as to reinforce, rather than challenge, beliefs about the future effectiveness of U.S. forces. Thus, as with sensing and seizing, strategic foresight can fail to deliver on its promises.

## **SUMMARY AND DISCUSSION**

In this paper, I addressed the question of how to cultivate the managerial judgment necessary to make strategy under uncertainty. Whereas some scholars have proposed the use of analogy as an answer, I argue that analogy triggers individual-level biases that degrade judgment, encouraging managers to prematurely adopt a focal hypothesis and reject disconfirmatory evidence. Analogy thus draws on and reinforces a monistic conception of the



future that is inappropriate in rapidly changing environments. By contrast, I maintain that the consideration of alternative futures, which is the hallmark of strategic foresight, suppresses those biases, discouraging adoption of a focal hypothesis and preserving a pluralistic view of the future that attunes managers to their environment, reduces overconfidence in specific courses of action, and renders mental models more flexible. In this, strategic foresight constitutes a dynamic capability, and the literature on dynamic capabilities can in turn provide standards by which to judge the effectiveness of strategic foresight efforts. In this paper, I have responded to a call from researchers who consider the lack of theory undergirding strategic foresight a “lost opportunity” that hinders both scholars and practitioners (Rohrbeck et al., 2015: 2).

My argument rests on certain epistemological and ontological notions, and it is important to question those notions. In particular, it is worth interrogating this paper’s definition of foresight not as the ability to predict the future but rather as a way of considering the future that assumes most of it cannot be predicted. But that is not the way that the field has traditionally defined foresight (e.g., Fayol, 1916/1949; Whitehead, 1933/1967). There is obviously significant organizational advantage to spotting the actual future before it materializes. It is therefore worth considering to what extent foresight *should* be about anticipating the future, which of course is a function of our ability to actually do so. Here, we must take note of research that has been pushing the boundaries of prediction in the service of judgment. Most notably, by participating in a multiyear forecasting tournament run by the Intelligence Advanced Research Projects Activity, a U.S. agency, a team of scholars at the University of Pennsylvania demonstrated that it is possible to improve the accuracy of geopolitical forecasts (Mellers et al., 2014; Tetlock & Gardner, 2015). Given the high degree of uncertainty in international affairs, this suggests that we can, in fact, reduce irreducible uncertainty, challenging more pessimistic epistemologies.

Just as there is reason to question whether prediction can offer so little, it is worth questioning whether foresight can offer so much, because there are few empirical studies on the debiasing effects of considering alternative futures, especially as compared with the abundant research on counterfactuals. Although, as explored earlier, there are neuroscientific reasons to believe that individuals treat the future much as they treat the past, psychology suggests that they treat judgments about the past differently than they treat judgments about the future (e.g., Fischhoff, 1975). Additionally, some studies on alternative futures deal with the future (“what will happen”) while some deal with the future perfect (“what will have happened”)—a distinction that could be important because the former involves aleatory uncertainty and the latter involves epistemic uncertainty, which can affect judgment (Fox & Ülkümen, 2011; Tannenbaum, Fox, & Ülkümen, 2015).

What’s more, the literature on counterfactuals is far from unanimous in finding that counterfactuals debias decision-making. For example, Galinsky and Moskowitz (2000) found that subjects encouraged to think about different possible pasts were better able to consider alternatives in the present, such as solutions to the Duncker candle problem, but that they performed worse on the Wason card task. It is possible that the effect of considering multiple pasts operates along multiple pathways. Much as accountability is a complex construct that can encourage individuals to either hedge or double-down on hypotheses depending on the circumstances (for a review, see Lerner & Tetlock, 1999), the consideration of temporal alternatives may sometimes decrease bias and sometimes increase it.

The decision-making literature is also conflicted about whether people naturally consider multiple futures. Kahneman and Tversky (1982a) maintained that simulation was automatic. But various studies indicate that it is not (Glucksberg & Weisberg, 1966; Snyder & Swann, 1978;

Hirt & Markman, 1995), and the tendency to settle on a focal hypothesis (Koehler, 1991) suggests prediction of a single future. Indeed, Galinsky and Moskowitz (2000) argue that simulation requires stimulation: experimenters must prompt subjects to consider alternatives (Wegner & Bargh, 1998). That said, once primed to consider alternatives, subjects will spontaneously—but consciously—generate alternatives additional to those they were asked to produce (Hirt et al., 2004). The consideration of alternative futures may be like that of counterfactuals—both automatic reflex and controlled process (Roese, Sanna, & Galinsky, 2005). And there may be individual differences in the tendency to consider alternative futures, much as individuals differ in their tendency to consider counterfactuals (Roese & Olson, 1995).

Meanwhile, the literature on prospection (Gilbert & Wilson, 2007), which decision-making scholars seem to ignore, maintains that individuals automatically consider alternative futures. Seligman and colleagues write: “[G]enerating simulations of the future can be conscious, but it is typically an implicit process—not requiring conscious initiation or monitoring, often not accessible to introspection, and apparently occurring spontaneously and continuously” (Seligman et al., 2013: 126). Nevertheless, they argue that prospection enables goal-setting and therefore impacts behavior in the present. Maintaining this ability to conceive and choose among alternate futures constitutes the faculty we think of as free will. By contrast, Fukukura and colleagues note that experimental research, by its very nature, embraces determinism and that prospection and its effects “may happen reflexively and with little awareness.” This raises “the interesting question of what necessary function traditional conscious processes serve as people think about and simulate the future” (Fukukura, Helzer, & Ferguson, 2013: 148). That philosophical question is beyond the scope of this paper, but simulating the future can contribute to management, improving judgment and the formulation of strategy under uncertainty.

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