

BEHAVIORAL STRATEGY

THOMAS C. POWELL,^{1,*} DAN LOVALLO,² and CRAIG R. FOX³

¹ Said Business School, University of Oxford and St. Hugh's College, Oxford, U.K.

² International Business, University of Sydney, Sydney, Australia

³ Anderson School of Management, University of California, Los Angeles, Los Angeles, California, U.S.A.

Behavioral strategy merges cognitive and social psychology with strategic management theory and practice. Despite much progress, the aims and boundaries of behavioral strategy remain unclear. In this paper we define behavioral strategy and identify the main unsolved problems. We propose a unifying conceptual framework for behavioral strategy and conclude by introducing the papers of the Special Issue on the Psychological Foundations of Strategic Management.
Copyright © 2011 John Wiley & Sons, Ltd.

INTRODUCTION

Behavioral strategy applies cognitive and social psychology to strategic management theory and practice. It aims to strengthen the empirical integrity and practical usefulness of strategy theory by grounding strategic management in realistic assumptions about human cognition, emotion, and social interaction.

Of course, this is not a new idea. Psychology influenced the early development of business policy and strategy and continues to influence strategic management through many streams of research: behavioral decision research (Kahneman

and Lovallo, 1993; Schwenk, 1984; Moore, Oesch, and Zietsma, 2007); the behavioral theory of the firm (Cyert and March, 1963; Bromiley, 2005; Gavetti, Levinthal, and Ocasio, 2007); cognitive schema, maps, sensemaking, and cognitive rivalry (Porac and Thomas, 1990; Reger and Huff, 1993; Lant and Baum, 1995; Weick, 1995); and topics such as escalation (Staw, 1981), aspirations (Greve, 1998), attribution (Salancik and Meindl, 1984), attention (Ocasio, 1997), emotions (Nickerson and Zenger, 2008), CEO pathology (Kets de Vries and Miller, 1984), hubris (Bollaert and Petit, 2010), and top management teams (Hambrick and Mason, 1984). Papers on dominant logic (Prahalad and Bettis, 1986) and the myopia of learning (Levinthal and March, 1993) received the *SMJ* Best Paper Prize.

We believe the time has come for new beginnings in behavioral strategy, for three reasons. First, strategic management has not kept pace with

Keywords: behavioral strategy; psychology; cognition; judgment; decision making

*Correspondence to: Thomas C. Powell, University of Oxford, Said Business School, Park End Street, Oxford OX1 1HP U.K.
E-mail: thomas.powell@sbs.ox.ac.uk

behavioral movements in economics and finance. This is surprising, since strategy research has fewer inhibiting assumptions about decision rationality. Nonetheless, behavioral economics and behavioral finance have led the way in generating new ideas and research methods and in building intellectual bridges with psychology and neuroscience. We believe behavioral strategy can do the same in strategic management.

Second, strategic management theory lacks adequate psychological grounding. Strategy theory has converged on a view that the crucial problem in strategic management is firm heterogeneity—why firms adopt different strategies and structures, why heterogeneity persists, and why competitors perform differently. Given these aims, existing theories are surprisingly parochial, explaining heterogeneity as Bainian market power protected by monopoly barriers, Penrosian resource advantages protected by factor scarcity, and Schumpeterian innovation driven by entrepreneurship and technology. These are the three pillars of strategic management theory.¹

Do these theories really explain firm heterogeneity? Recent performance shocks of companies like Lehman Brothers, Bear Stearns, and BP, and failed mergers such as AOL/Time-Warner and HP/Compaq, evidently do not stem from monopoly rents, factor scarcity, or entrepreneurship. The facts overwhelmingly implicate poor executive judgment, or larger macro-cultures of poor judgment. Conversely, sound executive judgment, and contextual architectures that promote sound judgment, can enhance firm performance. Until strategy theory builds stronger foundations in psychology, it will struggle to explain the facts of firm performance. To achieve empirical fidelity, we believe the field needs a robust subfield of behavioral strategy to serve as the fourth pillar of strategic management theory.

Third, recent developments provide new opportunities for merging psychology and strategy. Advances in cognitive neuroscience make it possible to examine brain activity in strategic decisions, and these technologies have spread quickly in economics, politics, marketing, and other social sciences. In experimental psychology, researchers are increasingly turning to multimethod research

designs, for example combining mathematical modelling, simulation, behavioral experiments, field interviews, and brain scans to gain multiple perspectives on the same phenomenon. These developments are nascent, but as strategic management matures as a field, psychology offers a rich source of insights in theory and method.

Behavioral strategy has the luxury of building on past research in cognition, behavioral decision theory, organizational behavior, and strategy. But much work remains to be done. Behavioral strategy is a patchwork of theories and findings, and cognitive psychology has not captured the hearts and minds of strategy researchers. In business schools, strategy departments routinely hire economists and sociologists, but seldom psychologists. Indeed, despite a large volume of output, experimental psychology has done little to address the problems of strategy theory and practice. Many strategy researchers regard the core unit of analysis in strategy as the firm or business unit rather than the individual, and there is skepticism about the scaling of psychological concepts to firms and industries. Strategy practitioners are, if anything, more skeptical than researchers, doubting whether the field can go beyond cognitive biases to produce useful frameworks that integrate psychology and strategy practice.

To some degree, the problem comes down to inadequate paradigm development in behavioral strategy. The term ‘behavioral strategy’ is not widely used and means different things to different people. Behavioral strategy does not have an agreed statement of purpose, definition of boundaries, conceptual framework, core research problems, methodological standards, communities of scholarship, or supporting institutions (such as an interest group in the Strategic Management Society). Despite more than 30 years of research, the output as a whole lacks integration and is too detached from central concerns in the field. A recent review of interdisciplinary influences on strategic management included economics, sociology, and marketing, but not psychology (Nag, Hambrick, and Chen, 2007). Quoting Mintzberg, Ahlstrand, and Lampel’s (1998: 172) review of the ‘cognitive school’ of strategy: ‘this school is characterized more by its potential than by its contributions. The central idea is valid...but strategic management has yet to gain sufficiently from cognitive psychology. Or, perhaps more accurately, cognitive psychology has yet to address

¹ This is not to minimize other key influences, such as institutional theories (Meyer and Rowan, 1977; Oliver, 1997) and the bargaining view (Lippman and Rumelt, 2003).

adequately the questions of prime interest to strategic management.'

On the positive side, there are signs that strategy scholars recognize these problems. Symposia in behavioral strategy have become a mainstay in recent Academy of Management meetings, supported by the Academy's Management and Organizational Cognition Division and with increasing submissions and attendance. Journal editors report an increasing number of submissions linking strategy and psychology, and more are being published. The *SMJ* Special Issue on the Psychological Foundations of Strategic Management received an unprecedented number of submissions, and the range and quality of the papers were impressive. On the whole, there are reasons for optimism in behavioral strategy.

The remainder of this paper sketches, in broad outline, a vision for the future of behavioral strategy. The next section defines the field, gives a typology of existing research, and proposes four core research problems in behavioral strategy. The subsequent section presents an integrated conceptual view of the field, and the concluding section introduces the papers in the Special Issue. We do not presume to have all the answers, but we are convinced that behavioral strategy has much to contribute to strategic management and that scholars can take positive steps to make it happen.

DEFINING BEHAVIORAL STRATEGY

We define behavioral strategy as follows:

Behavioral strategy merges cognitive and social psychology with strategic management theory and practice. Behavioral strategy aims to bring realistic assumptions about human cognition, emotions, and social behavior to the strategic management of organizations and, thereby, to enrich strategy theory, empirical research, and real-world practice.

This definition is based on two assumptions. First, we assume that behavioral strategy needs theoretical grounding in cognitive and social psychology. The definition allows many research topics and methods, but we intend it to exclude work that lacks rigorous theoretical grounding in psychology. At the same time, we intend it

to encourage a wide range of psychology perspectives, and our definition of 'cognitive and social psychology' is probably broader than most; for example, we do not exclude nonexperimental methods, and we believe that behavioral strategy is best supported by multiple methods and measures.

Second, we assume that the crucial problem in behavioral strategy is not a shortage of good research, but a lack of conceptual unity. The field does not need more psychology research *per se*, but more integration of appropriate psychology into strategic management theory. We do not promote psychology for its own sake, but for achieving two specific aims—bringing strategy theory closer to the empirical facts and integrating strategy research with strategy practice.

With these caveats in mind, our definition embraces topics in the existing core of behavioral strategy (such as decision biases and cognitive schema), while encouraging innovations that go beyond the status quo (which we will discuss). Research methodologies may include experiments, mathematical modelling, simulations, brain imaging, field studies, ethnography, and textual analysis, always with a preference for multimethod studies. We believe methodological diversity will prove essential for improving our understanding of individual and social behavior in organizations.

Behavioral strategy encompasses a mind-boggling diversity of topics and methods. As shown in previous reviews, conceptual unity has been hard to achieve and the domain of possible research is, to say the least, varied (see, for example, Hodgkinson and Healey, 2008; Hodgkinson, 2008; Walsh, 1995; Eisenhardt and Zbaracki, 1992).

On the other hand, the diversity of behavioral strategy research mirrors, to a large degree, actual diversity in the empirical domain. This is shown more clearly in Table 1, which categorizes existing research into three schools of thought, which we call the Reductionist, Pluralist, and Contextualist schools (see Tetlock, 1990, 2000).

Reductionist research relies on positivist, realist, and objectivist philosophies of science and favors quantitative hypothesis testing using methods such as mathematical modelling, simulation, and laboratory decision experiments. The Reductionist school is influenced by theoretical work in behavioral decision research (Edwards, 1954, 1961; Tversky and Kahneman, 1974; Kahneman and Tversky, 1979; Nisbett and Ross, 1980) and

Table 1. Three schools of behavioral strategy

	REDUCTIONIST	PLURALIST	CONTEXTUALIST
Philosophical foundations	Positivism, objectivism, materialism, scientific realism, verificationism	Nominalism, pragmatism, evolutionism	Phenomenology, existentialism, critical theory, postmodernism, symbolic interactionism, contextualism, social construction of reality
Core processes of interest	Individual decision making, intragroup decision making	Intergroup bargaining, problem solving, politics, conflict resolution, organizational learning, resource allocation	Sensemaking, perception, enactment, action generation
Key psychological concepts	Bounded rationality, prospect theory, heuristics and biases, dynamic inconsistency	Reference groups, social cognition, social identity theory, self-categorization	Cognitive schema, language, meaning, signs, ideology, action rationality, culture
Methodologies	Hypothesis testing, decision experiments, simulation, mathematical and computational modelling, neural methods	Field studies, event studies, multivariate statistics, cases, mixed methods	Interpretive histories, ethnography, grounded theorizing, hermeneutics, textual analysis, discourse analysis, semiotics, cases
Assumptions about firms	Firms' decisions are made by top executives, entrepreneurs, and top management teams; decisions are subject to cognitive biases	Firms consist of subgroups with conflicting goals and perspectives; firms resolve strategy problems via conflict resolution and intergroup bargaining	Firms and environments are socially constructed; firms are ideological; decisions and actions are decoupled; actions are emergent, externally influenced
Contributions to strategic management	Cognitive biases in strategic decisions (e.g., competitive blind spots, competition neglect, winner's curse, hubris, escalation of commitment); dynamic inconsistency	Behavioral theory of the firm, group identification, aspirations, maladaptive learning, organizational neuroses	Action rationality, cognitive schema, cognitive maps, cognitive rivalry, dominant logic, sensemaking, misperception, enactment, mindfulness, critical theory
Some contributors past and present	Selten, Edwards, Simon, Von Neumann-Morgenstern, Luce-Raiffa, Tversky-Kahneman, Schelling, Akerlof, Smith, Thaler-Shefrin, Elster, Bazerman, Loewenstein, Camerer, Hogarth, Nisbett-Ross, Moore, Fox, Lovallo	March, Cyert, Simon, Lawrence-Lorsch, Tajfel, Turner, Fiske-Taylor, Bower, Miller, Kets de Vries, Hambrick, Levinthal, Denrell, Bromiley, Rumelt, Winter, Feigenbaum-Hart-Schendel	Weick, Starbuck, Pettigrew, Brunsson, March, Staw, Smircich, Hardy, Mintzberg, Thomas, Van Maanan, Abrahamson, Reger, Huff, Fiol, Porac, Dutton, Mezias, Lant, Milliken, Hodgkinson, Thomas, Bettis, Mitroff

Table 1. (Continued)

	REDUCTIONIST	PLURALIST	CONTEXTUALIST
Linkages to traditional schools of psychology	Structuralism, behaviorism, cognitive psychology, experimental social psychology, neuroscience	Functionalism, functionalist social psychology, gestaltism, evolutionary psychology	Existentialism, humanism, critical schools, feminist psychology, postmodern psychology
Historical influences in psychology and social science	Wundt, Titchener, Pavlov, Ebbinghaus, Watson, Thorndike, Tolman, Skinner, F. Allport, Neisser	James, Stumpf, Dewey, Darwin, Mead, Wertheimer, Koffka, Kohler, Merton, Lewin, Asch, Heider, Festinger	Merleau-Ponty, Blumer, Glazer-Strauss, Giddens, Berger-Luckmann, Fromm
Historical influences in ontology and epistemology	Aristotle, Bacon, Comte, Carnap, Nagel, Vienna Circle, Popper, Ayer, early Wittgenstein	Plato, Berkeley, Hume, Kant, Mach, James, Dewey	Hegel, Kierkegaard, Brentano, Husserl, Schutz, Peirce, Sartre, Horkheimer, Adorno, later Wittgenstein, Rorty, Foucault

has made important contributions in strategic decision making, cognitive biases, risk perception, and intertemporal choice. Examples of the Reductionist influence in strategy include Duhaime and Schwenk (1985) on cognitive errors in acquisition and divestment, Camerer and Lovallo (1999) on overconfidence and market entry, March and Shapira (1987) on managerial risk preferences, and Bromiley (2009) on prospect theory and resource allocation. Much of the recent progress in behavioral game theory and neuroeconomics derives from Reductionist assumptions (Camerer, 2003; Camerer, Loewenstein, and Prelec, 2005).

Pluralist research is so named because it draws on multiple theoretical traditions and uses methods ranging from case studies and simulations to large sample field research. The Pluralist school is grounded in positivist, nominalist, pragmatist, or evolutionary philosophies of science. Pluralist research is less concerned with individual decision making than with the overall decision environment of the firm. Combining behavioral decision theory with political theory (March, 1962; Wildavsky, 1972), organization theory (March and Simon, 1958), and social cognition psychology (Fiske and Taylor, 2008; Bandura, 1977; Festinger, 1954), Pluralist research studies the consequences of bounded rationality, group conflict, learning, and executive decision making in organizations. Examples of Pluralist influence in strategy include Cohen and Levinthal (1990) on absorptive

capacity, Fiol (1991) on organization culture and identity, Terry and Callan (1998) on ingroup bias and merger, and Fiegenbaum, Hart, and Schendel (1996) on strategic reference groups.

The Contextualist school is grounded in phenomenological, constructivist, and critical philosophies of science. Contextualist research is concerned with management perception, sense-making, cognitive schema, language, meaning, and enacted environments. The school is ‘contextual’ in emphasizing the primacy of context—claiming, for example, that the difference between a seasoned executive in the boardroom and a subject playing an ultimatum game in a lab experiment is ontologically large. As such, Contextualists conduct empirical work ‘in context,’ favoring qualitative and interpretive methods such as ethnography and textual analysis and rejecting positivism and quantitative hypothesis testing. In the Contextualist view, subjective beliefs, shared ideologies, and cognitive frames matter more than explicit *ex ante* decisions, which seldom correspond with what people or firms actually do. Examples of the Contextualist influence in strategy include Bougon, Weick, and Binkhorst (1977) on cognition in a jazz orchestra, Brunsson (1982) on ideology and action rationality, Starbuck and Milliken (1988a) on the Challenger disaster, and Hodgkinson, Maule, and Bown (2004) on cognitive mapping.

The three schools give only a rough picture of research in behavioral strategy. The schools

are not as clearly bounded as the table suggests, and hybrid approaches shade into one another by degrees. Some researchers operate in more than one school, which is not surprising—the typology categorizes outputs rather than people, and many researchers work from multiple points of view.

Table 1 brings the extreme heterogeneity of behavioral strategy into sharp relief. There is little agreement, even on issues as fundamental as the unit of analysis, with Reductionists focusing on individual judgments and decision making, Pluralists on organizationally situated managers or groups, and Contextualists on cognitive maps, schema, and management perceptions. All too often, researchers in different schools study similar problems with minimal concern for cross-fertilization or knowledge accumulation. In the end, researchers have produced an impressive volume of output, much of it very insightful, but with little or no collective synergy. As a whole, the enterprise resembles a growth-driven conglomerate more than a focused, competence-driven corporation.

Many scholars believe that behavioral strategy could achieve greater synergies by redefining its boundaries—for example, by focusing on one of the three schools of behavioral strategy. The preferred candidate is often the Reductionist school, following the examples of economics and finance. According to this view, a tightly defined field of behavioral strategy, focused on measurement, experiment, and hypothesis testing, with new extensions into cognitive neuroscience, offers the best chance of paradigmatic unity and cumulative progress.

The Reductionist school will play a major role in the future of behavioral strategy. However, we do not advocate restricting behavioral strategy to one school of thought. The diversity in Table 1 is not an aberration but an inherent feature of psychology and the empirical domain of strategic management. The Reductionist school cannot cover the problem space of behavioral strategy, and none of the three schools has a monopoly on truth. Strategic outcomes stem from individuals, groups, and organizations interacting in uncertain environments. We believe diversity is the only reasonable option and that leveraging and integrating the three schools of thought should become the first priority of behavioral strategy.

So how can behavioral strategy move toward intellectual unity? Instead of restricting its toolkit

of theories and methods, we believe that behavioral strategy should apply all of its tools to a smaller number of core research problems. The unsystematic approach of the past has left many opportunities neglected and gaps to be filled. Collectively, the field has been ineffective in using psychology to build strategy theory or link theory with practice.

The remainder of this section identifies four core research problems in behavioral strategy. The problems span all three schools of behavioral strategy and need contributions from each. By applying their respective strengths to the core problems and by finding imaginative ways to interact and collaborate, we believe the Reductionist, Pluralist, and Contextualist schools can work synergistically to accumulate theoretical and applied knowledge.

HOW DOES INDIVIDUAL COGNITION SCALE TO COLLECTIVE BEHAVIOR?

Cognitive psychology focuses on mental processes within an individual, whereas strategic management has traditionally focused on the firm, business unit, or corporation. We believe the perceived gap between individual cognition and collective strategy has done more to impede behavioral strategy than any other problem.

Decision researchers often assume the strategic actions of firms reflect choices by a CEO or top management team. This assumption may indeed hold if the firm is small, entrepreneurial, autocratic, or family owned or if the decision falls outside annual planning processes (Lovallo and Sibony, 2010). But research in behavioral strategy must avoid the trap of making simplistic assumptions about mental scaling—for example, assuming that a firm or corporation has the psychology of an individual, that one person chooses for the collective, that the firm's actions correspond to a person's decisions, or that many individual choices sum to a collective choice.

Behavioral strategy has a long way to go in linking individual psychology with organizational strategies. One of the distinctive features of strategic management is its emphasis on collective behavior, and behavioral strategy must explain the psychological or social mechanisms by which mental processes affect organizations. Researchers' scaling assumptions can and should be made explicit (Elster, 1982; Ostrom, 1997) and in

behavioral strategy, the *whole question* is how particular forms of behavior arise in and among organizations. If we do not show the mechanism, we do not explain the phenomenon.

The problem of aggregation is not unique to behavioral strategy. Behavioral economists since at least Schelling (1978) have studied relationships between individual choices and collective outcomes. Fehr and Tyran (2005) argued that the mode of aggregation depends on market conditions—in particular, whether ‘strategic substitutability’ or ‘strategic complementarity’ determine aggregate outcomes. Substitutability obtains when the presence of a few rational decision makers is enough to produce collective rationality; complementarity obtains when a small number of irrational decision makers can skew collective outcomes. For example, Firm A’s decision to increase output may influence Firm B not to build a new plant (substitutability), whereas Firm A’s decision to cut price may cause Firm B to cut price even more (complementarity). As Fehr and Tyran (2005: 43) note, ‘there is no general reason to believe that markets automatically render individual decisions more rational over time.’

In behavioral finance, researchers have studied how noise traders affect market outcomes. In the model proposed by DeLong *et al.* (1991), it is possible for irrational traders to earn higher returns than rational investors and dominate the market in the long run. Barber, Heath, and Odean (2003) compared the investment strategies of individuals and groups (stock clubs). They found that groups, to a greater extent than individuals, try to justify their stock choices with defensible reasons. Groups do this even when their choices contradict sound investment policy—for example, justifying popular growth stocks over lesser-known value stocks. In this context, cognitive scaling stems less from ‘complementarity’ (increasing returns to individual irrationality) than from the social psychology of group membership: ‘in situations where people must exchange reasons to convince others...the process we document may yield alternatives that have notable disadvantages but that happen to come attached to a good reason.’ (DeLong *et al.*, 1991: 1651).

In social psychology and behavioral decision theory, researchers have dealt in various ways with the aggregation of mental processes, some of which offer insights to behavioral strategy. This includes research on groupthink (Janis, 1972),

group polarization (Isenberg, 1986), common information sampling bias (Stasser and Titus, 1985), social facilitation (Zajonc, 1965), social loafing (Latane, Williams, and Harkins, 1979), and transactive memory systems, through which groups collectively encode, store, and retrieve knowledge (Wegner, 1987).

The problem of scaling has also been addressed in management science and organization theory. From Reductionist assumptions, Marschak (1955) proposed a mathematical model of team production. From Contextualist assumptions, Harris (1994) examined how organizations, groups, and cultures are represented in the cognitive schema of individuals. From a Pluralist perspective, Freeman (1999) surveyed aggregation issues arising from transaction cost and agency theories. Freeman’s (1999: 175) conclusions about organizational psychology also apply to behavioral strategy: ‘if organizational psychology is simply psychology applied to people who happen to be located in organizations, then it is hard to see why a separate field is needed... (A) way out of the box is to posit a true social psychology of organizations: a theory of aggregation that explains how individuals combine their behaviors to produce collective outcomes.’

Freeman (1999) did not propose a ‘way out of the box,’ but he recommended as a starting point the organization theories of Cyert, March, Simon, and colleagues at Carnegie. The behavioral theory of the firm views organizations as comprised of differentiated subunits with conflicting goals, resources, and time horizons (Cyert and March, 1963). In the Carnegie view, organizational strategy is largely a political process, involving coalition building, bargaining, and conflict resolution among representatives of differentiated subunits (see also Lawrence and Lorsch, 1967; Bower, 1970; Miles and Snow, 1978). The CEO must orchestrate an organization-wide political process, and subunit managers face what Blake (1959) called the ‘crisis of statesmanship,’ in which they try to reconcile firm-level priorities with personal goals and political status with peers and constituents.

We agree with Freeman that the Carnegie model offers a solid foundation for linking individual psychology with organizational strategy (see also Bromiley, 2005; Argote and Greve, 2007). The model’s emphasis on bargaining and political processes allows researchers to deploy a range of

ideas in social cognition and group identification, including self-categorization, conformity, obedience, status, reputation, accountability, trust, social learning, and reference groups (Fiske and Taylor, 2008; Bandura, 1977; Tajfel, 1978; Turner, 1975; Festinger, 1954). The psychology of identification, and research on social identity in particular, offers many avenues for bridging the gap between individual cognition and organizational strategy (Haslam, 2004; Ashforth and Mael, 1989; Hogg and Terry, 2000; Dutton, Dukerich, and Harquail, 1994; Huber and Lewis, 2010). For example, Terry and Callan (1998) used social identity theory to examine out-group bias in a hospital merger; Rumelt (1995) proposed a model linking psychology and organizational inertia through sub-unit conflict resolution; and Livengood and Reger (2010) combined identity theory with awareness-motivation-capability (AMC) theory to explore competitive interactions (see also Huy, 2011).

The scaling problem is far from solved, and it is often improperly framed. As Freeman (1999) suggested, the question is not about scaling or aggregation *per se*, which assume a kind of adding up of individual cognition. Rather the question is how we integrate individual and collective psychology in organizations to produce a social psychology of behavioral strategy. The behavioral theory of the firm is a good starting point, and Reductionist and Contextualist approaches (including social neuroscience) can add texture and insight to the Carnegie view. To deal effectively with the problem, the field needs contributions from all three schools of behavioral strategy.

WHAT ARE THE PSYCHOLOGICAL UNDERPINNINGS OF STRATEGIC MANAGEMENT THEORY?

In 2008, a proposal for an Academy of Management symposium on behavioral strategy began:

'Strategy is concerned with finding profit opportunities. In teaching as well as practice, the implicit assumption is that not all opportunities have been exploited. Rather, there is money left on the table. We argue that an appropriate theoretical foundation for strategy should start with the assumption that there are arbitrage opportunities...The purpose of this symposium is to bring together

researchers from strategy, behavioral finance, and behavioral decision theory/economics to examine the issue of market efficiency and strategy. The idea is not to review research on biases and irrationality. Rather, the ambition is to flesh out a research agenda for "behavioral strategy." (Winter *et al.*, 2008)

The proposal then identified five research questions in behavioral strategy:

- When and why are resources and input factors undervalued?
- When and why can arbitrage opportunities exist in factor and product markets?
- What are the limits to arbitrage in factor and product markets?
- What are the implications for strategy?
- Is a normative theory of strategy possible?

These questions do not, in our opinion, constitute the whole of behavioral strategy. However, they raise important issues in strategic management research, some of which can be addressed through a closer alignment of psychology and strategy.

Denrell, Fang, and Winter (2003) argue that strategy theories rely too much on theories of market efficiency and equilibrium. If market participants acted optimally on information about resources and market positions, firms could not improve performance by following systematic rules. In strategy theory, there are 'no rules for riches'; if such a rule existed, other firms would follow it and compete away its value (Barney, 1986). However, managers do take actions that improve firm performance, and not all of these actions can be ascribed to luck. According to Denrell *et al.* (2003: 978), 'the discovery of a valuable strategic opportunity is often a matter of 'serendipity' in the strict sense—not just luck, but effort and luck joined by alertness and flexibility. To appreciate these points it is necessary to break out of the equilibrium mindset that dominates so much of economic theory.'

It is possible that firms differ from each other for precisely the reasons emphasized in strategy theory, such as resource scarcity, mobility barriers, causal ambiguity, and uncertain imitability. However, this assumes market participants are paying attention to markets and acting on what they know. An alternative hypothesis is that

firms generally fail to capture their opportunities, solve their problems, or imitate imitable resources (Powell, 2004). This could happen, for example, if decision makers are subject to self-confirming beliefs (Ryall, 2003), overoptimism in strategic forecasting (Lovallo and Kahneman, 2003), competitive blind spots (Zajac and Bazerman, 1991), self-interested causal attributions (Powell, Lovallo, and Caringal, 2006), disordered learning processes (Denrell, 2008), institutional conformity (Abrahamson, 1991), unwillingness to imitate (Jonsson and Regner, 2009), or perceptual filtering (Starbuck and Milliken, 1988b). Suboptimal behavior could also emerge from emotions such as envy, prejudice, anger, hubris, and impulsivity (Elfenbein, 2007; Rafaeli and Sutton 1989; Postrel and Rumelt, 1992), which can jeopardize or improve performance (Staw and Barsade, 1993; Huy, 1999; Pfeffer and Sutton, 1999; Howard, 1993). Even large firms might behave erratically due to poor executive judgment, as we observe. Under any such conditions, some market participants would find opportunities to adopt strategies that improve firm performance. As Bromiley and Papenhausen (2003: 432) point out, ‘the entire ‘no rules for riches’ story...collapses if we have rules that could improve performance. This would arise when some firms either do not know the rules exist or do not act on them.’

Studies show that actual distributions of firm profitability are consistent with generating processes that contain a great deal of randomness (Levinthal, 1991; Powell, 2003; Denrell, 2004), and some forms of competitive behavior derive from the inherent uncertainty or randomness of markets (Bertrand and Mullainathan, 2001; Lippman and Rumelt, 1982). For example, corporate success induces self-serving attributions, and executives are likely to attribute success to their own abilities, even when success is due to excessive risk taking or luck (Salancik and Meindl, 1984). If executive decisions are informed by false or overconfident attributions, some market participants may find it possible to exploit market opportunities (Denrell and Fang, 2010).

We agree with those who argue that strategic management theory needs deep reformulation along behavioral lines. The assumption that firm heterogeneity stems from economic barriers does not align with what we know about human cognition, emotions, learning, social interactions, and institutions. Until theories of firm heterogeneity

fully incorporate psychology, the empirical facts will continue to frustrate our attempts to explain them, and researchers will find it impossible to integrate theory with strategy practice.

CAN BEHAVIORAL STRATEGY EXPLAIN COMPLEX EXECUTIVE JUDGMENTS?

Research in behavioral decision theory (BDT) shows that individuals lack the cognitive capacity to make fully informed and unbiased decisions in complex environments (Kahneman, Slovic, and Tversky, 1982; Payne, Bettman, and Johnson, 1988). To cope with complex judgments and decisions, people use simplifying heuristics that are prone to systematic biases. Decision makers do not maximize the subjective expected utility of total wealth, but focus on deviations from cognitive reference points. BDT has found many applications in the social sciences, including strategic management (Bazerman and Moore, 2008).

BDT has not yet realized its full potential in strategic management (Hodgkinson and Sparrow, 2002). It does not link seamlessly with strategy theory and it has not made large impacts on strategy practice. The decision context of strategic management involves organizationally situated managers, widespread uncertainty, and poorly defined problems with unknowable social and economic consequences. In the circumstances, we believe strategy research should increase its emphasis on *executive judgment* in the actual conditions of high-stakes, complex problem solving in organizations.

Management scholars have always recognized the complexity of strategic problem solving in organizations. Peter Drucker (1974) viewed executive work as a practice, not unlike problem solving in medicine, architecture, military affairs, and foreign policy. He wrote that ‘decision making is not a mechanical job. It is risk-taking and a challenge to judgment. The ‘right answer’ (which usually cannot be found anyway) is not central. Central is understanding of the problem. Decision making, further, is not an intellectual exercise. It mobilizes the vision, energies and resources of the organization for effective action’ (Drucker, 1974: 480).

Herbert Simon (1987) distinguished two kinds of organizational decisions: *logical* and *judgmental*. Simon cited Chester Barnard, who defined

'logical' decisions as those involving 'conscious thinking which could be expressed in words or by other symbols,' whereas judgmental decisions, which Barnard called 'non-logical,' were those 'not capable of being expressed in words or as reasoning, which are only made known by judgment, decision or action' (Simon, 1987: 57). Going further, Barnard (1938: 302) wrote: 'the sources of these non-logical processes lie in physiological conditions or factors, or in the physical and social environment, mostly impressed upon us unconsciously...They also consist of the mass of facts, patterns, concepts, techniques, abstractions, and generally what we call formal knowledge or beliefs, which are impressed upon our minds more or less by conscious effort and study.'

Simon (1987) linked judgment to expert intuition, drawing analogies to expert computer systems and pattern recognition in chess and medicine. But Simon (1987) recognized that executive judgment in organizations involves more than programmable or expert intuition. Exactly what it does involve was unclear then and remains unclear today. After reviewing two studies on executive judgment, Simon (1987: 61) concluded that 'these two pieces of research are just drops of water in a large bucket that needs filling. The description, in detail, of the use of judgmental and analytical processes in expert problem solving and decision making deserves a high priority in the agenda of management research.'

Complex judgments have indeed received attention in decision research—for example, Janis and Mann (1977) developed a descriptive theory of conflict in complex policy decisions, and Klein (1998) has described intuition and judgment in a variety of applied contexts (see also Kahneman and Klein, 2009). Judgment has also been addressed in strategic management (Priem and Cyryota, 2001; Hodgkinson, Langan-Fox, and Sadler-Smith, 2008; Schoemaker, 1990). However, Simon's statement generally holds true today. Strategy research has not produced enough empirical research on complex judgments and does not have a unified view of complex problem solving in organizations. Perhaps the 'decision' is not the right unit of analysis in behavioral strategy, or not *always* the right unit. One of the key challenges in behavioral strategy research is to show how decisions fit within the larger and more complex domain of strategic problem solving in organizations.

CAN WE IMPROVE THE PSYCHOLOGICAL ARCHITECTURE OF THE FIRM?

Researchers have proposed a variety of methods for overcoming decision biases (Kahneman *et al.*, 1982, chapters 28–32; Russo and Schoemaker, 2002). Schwenk and Thomas (1983) proposed a framework for matching strategy problems with decision aids such as dialectical inquiry, devil's advocacy, scenario analysis, and the Delphi procedure; Soll and Larrick (2009) found that people generally do better when they average between two proposed solutions than when they choose one or the other; Gawande (2009) claimed that introducing checklists reduced errors in health care management and construction; and Donaldson (2010) proposed ways for managers to minimize sampling biases and other errors in statistical reasoning.

Despite these methods, individual biases persist in organizations. As Tetlock (2000: 324) points out, decision biases are not 'merely atavistic vestiges of a more primitive social order, soon to be swept away by the intensification of competitive market forces.' In organizations, people operate in a world of subgroup norms, political ideologies, consensus building, and self-presentation. Cognitive biases are deeply embedded in routines, automatic behavior, psycho-physical distortions, and executives' knowledge structures. In practice, emotional, social, and political realities nearly always trump decision aids in their influence on organizational judgments.

This raises two questions:

- What are the intended and unintended consequences of individual de-biasing in organizations?
- Is it possible to design the psychological architecture of the firm, including both choice architecture and decision processes, to yield better executive judgments?

Thaler and Sunstein (2008) argued that researchers should accept that decision makers are ordinary human beings with faulty cognition and poor self control. Instead of trying to fix the hardwired errors of individual cognition, organizations should focus on managing the psychological architecture of the choice environment—for example, by conspicuously displaying the running costs of manufacturing equipment or designing work spaces that

encourage people to seek alternative points of view (see also Johnson *et al.*, 2011). The authors argue that ecological 'nudges,' supplemented by rewards and incentives, offer a workable and human-friendly alternative to explicit decision aids.

Arkes (1991) distinguished three types of errors—strategy-based, association-based, and psycho-physically-based—and Larrick (2004) argued that remediation methods should fit the type of error. Heath, Larrick, and Klayman (1998) divided organizational repairs into two categories: *motivational* repairs, which increase the energy and enthusiasm with which people work; and *cognitive* repairs, which prevent mental errors or improve decision processes. For example, as motivational repairs, managers could increase the decision autonomy of project teams or redesign common areas to enhance 'psychological capital' (Luthans, Youssef, and Avolio, 2007); as cognitive repairs, managers could address overoptimism in forecasting by investing in training and databases for case-based decision making.

Denrell and March (2001) argued that many errors in learning and inference derive from dysfunctional learning environments and would exist even if all decision makers were rational. For example, consider an executive team choosing how to enter a foreign market. Suppose the firm has previous experience in market entry by joint venture once (a failure) and by acquisition four times (two successes and two failures). By the structure of the selection process, the team has asymmetric information—i.e., more information about acquisitions than joint ventures. Hence, it has learned the conditions under which acquisitions succeed and fail and is likely to choose a form of acquisition that succeeded in the past. Since the team has minimal information about joint ventures, and all of it is bad, it eliminates this option (the 'hot stove effect'). This is true even if joint venture is the optimal choice but requires competence building by repeat experience. This is not cognitive bias but an anomaly in the adaptive learning process. Rational selection demands the search for successful options and avoidance of failed options. As a side consequence, it produces undersampling of failure (see also Markle, 2011).

Lovallo and Sibony (2010) distinguished between recurrent strategic decisions, such as resource allocations in R&D projects, and large one-off decisions for which the firm lacks established choice processes, such as responding to a new

market entrant. To minimize decision biases, the authors recommend that firms link their strategic decisions with known decision biases and create choice architectures for dealing with the biases they actually face. For example, all large pharmaceutical firms engage in basic research and are repeatedly susceptible to escalation bias and the politics of internal resource allocation. Most firms link R&D investments to the annual planning cycle, in which each business line makes a case for resources. However, one leading firm addressed escalation bias proactively by forming a detached 'divestment team' that scans internal projects year-round for possible retirement. Can such mechanisms lead to better resource allocations and, ultimately, to higher returns? Given the difficulties of repairing individual biases, firm-level solutions may offer the best way forward.

The psychological design of organizations is a promising area for strategy research. Experience suggests that judgmental errors stem from a combination of cognitive errors and the context of choice. On the whole, individual cognitive errors have received more attention than the psychological architecture of the firm, even though the latter now appears more conducive to positive intervention (see Kahneman and Klein, 2009). We believe that future research should give equal time to the psychological architectures of collective choice.

PUTTING IT ALL TOGETHER

As a nascent field of study, behavioral strategy faces two opposing threats: the threat of irrelevance by focusing too narrowly on one model (such as BDT or cognitive schema); and the threat of fragmentation by trying to appease every point of view in strategy and psychology. In our opinion, behavioral strategy needs to follow a middle path, recognizing the diversity of the tasks it faces, while focusing on a small number of core problems. Behavioral strategy may converge to one paradigm in a future generation (though we think this is unlikely); in the meantime, behavioral strategy needs to find unity within diversity.

The good news is that the scope of behavioral strategy is not infinite. The field may have multiple paradigms, but it does not have 40 or 50 of them. Figure 1 depicts the conceptual model we have in mind.

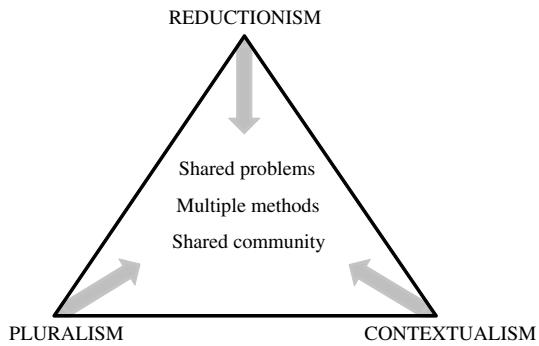


Figure 1. Behavioral strategy: an integrative view

In Figure 1, the domain of behavioral strategy is bounded by its three main schools of thought: Reductionism, Pluralism, and Contextualism. Each school tells part of the truth about behavioral strategy; each can reasonably be called a paradigm. The Reductionist paradigm deals with the psychological character of economic decision making, which is best studied quantitatively and experimentally; its core model is behavioral decision theory. The Pluralist paradigm deals with the psychological character of complex political judgments in large organizations and is best studied by observations in the field; its core model is the internally differentiated organization. The Contextualist paradigm deals with the character of management perceptions and mental frames and is best studied by interpretive, symbolic, ethnographic, or hermeneutic methods; its core model is schema theory.

In past research, the three paradigms operated in relative independence. Economically inclined researchers conducted experiments on biases, heuristics, and experiments; organizationally inclined researchers studied CEOs, top management teams, and organization structures; sociologically inclined researchers studied cognitive frames, perceptions, and schema.

At the same time, some researchers operated in more than one paradigm—people like Herbert Simon, James March, Karl Weick, Barry Staw, Sidney Winter, and Bill Starbuck—and many researchers still do. We take this as evidence that the three paradigms are not incompatible and that research in behavioral strategy can combine a wide field of vision with a capacity for disciplinary integration.

These are the traits that behavioral strategy needs to cultivate as a field of study. On one side, we recognize that researchers need to work

on well-defined problems within their domains of specialization. On the other, we do not see a contradiction in seeking within-paradigm *and* across-paradigm contributions, along with a greater degree of openness (Bendersky and McGinn, 2010). We believe disciplinary unity will flow from three practices: attending to a small number of core problems; adopting a policy of methodological pluralism and multimethod research; and strengthening the institutional and social fabric of the community of scholars and practitioners in behavioral strategy.

Our vision for behavioral strategy can be summarized in the following seven points:

1. Definition: Behavioral strategy merges cognitive and social psychology with strategic management theory and practice. Behavioral strategy aims to bring realistic assumptions about human cognition, emotions, and social behavior to the strategic management of organizations and, thereby, to enrich strategy theory, empirical research, and real-world practice.
2. We construe cognitive and social psychology broadly. The domain of behavioral strategy comprises three paradigms: Reductionist, Pluralist, and Contextualist. The field should embrace insights from all three paradigms.
3. Behavioral strategy should strive for greater disciplinary unity. The field should welcome the diversity of a three-paradigm world rather than excluding any of them. There are three ways to build a more unified discipline of behavioral strategy: problem integration, methodology integration, and community integration.
4. Problem integration: Behavioral strategy should bring all three paradigms to bear on a small number of core research problems. We propose four core problems: (1) scaling individual cognition to collective behavior; (2) defining the psychological underpinnings of strategy theory; (3) understanding complex judgment in organizations; and (4) improving the psychological architecture of the firm.
5. Methodology integration: Behavioral strategy should adopt a principle of methodological pluralism and intellectual sharing. Researchers should design multimethod studies, and journal editors and reviewers should set expectations accordingly. Researchers should prioritize knowledge accumulation for the field as a whole.

6. Community integration: Researchers, practitioners and others should focus on strengthening the social and institutional fabric of behavioral strategy. Researchers should organize an interest group in the Strategic Management Society and specialized workshops and conferences. Efforts have been made in this direction, but much more can be done to build name recognition, reputation, and intellectual unity in the field. We believe the Strategic Management Society is the right venue for taking the lead in this effort.
7. Though its three base paradigms are historically grounded and relatively stable, behavioral strategy should strive for growth, dynamism, and creative leadership in defining new research problems and methods. Many changes are happening even now—the shift from decisions to complex judgments; from individual biases to choice architecture; from introspection to cognitive neuroscience. We believe behavioral strategy should stay abreast of these trends and take leadership in exploring new research frontiers at the intersection of strategy and psychology.

As behavioral strategy expands and develops, we believe the benefits of methodological pluralism will become increasingly apparent. As coeditors of the Special Issue, we reviewed papers covering a wide range of methods: mathematical models, simulations, brain scans, lab experiments, field surveys, case studies, LISREL analyses, event studies, comparative studies, discourse analyses, cognitive mapping, and others. However, we were surprised by how few papers tried to put these methods together—for example, combining experiments with event studies, simulations with discourse analysis, or cognitive maps with brain scanning. We see mixed-methods research as the future of behavioral strategy. Indeed, the opportunities are so great—intellectually, socially, institutionally—that it seems inevitable that the field will move in this direction. Opportunities for mixed-methods research have been cited earlier, and models can be found in other disciplines—for example, the Henrich *et al.* (2004) program of combining anthropology and game theory to study ultimatum games, dictator games, and public goods games in international cultures. We believe methodological pluralism should become the standard for research in behavioral strategy.

SPECIAL ISSUE: PSYCHOLOGICAL FOUNDATIONS OF STRATEGIC MANAGEMENT

The Call for Papers for the Special Issue was issued in April 2008, with a submission deadline of January 20, 2009. As part of the SMS Annual Meeting, a preconference meeting was held in Washington, D.C., in October 2009, in which papers still under consideration were presented and discussed.

The Call for Papers invited submissions on a broad range of topics and using varied methodologies:

'We invite conceptual or empirical papers dealing with the psychological origins of strategy, with particular emphasis on how psychology can inform theory and empirical research on strategy formation, resource formation and deployment, strategy implementation, market efficiency, and sustained competitive advantage. For empirical studies, we welcome both conventional methods and new or emerging methodologies, including natural or controlled experiments, numerical or agent-based simulation, mathematical modelling, or neuro-physiological research such as brain scans.'

We received a very large number of submissions, more than any previous *SMJ* Special Issue. The response demonstrated the scope and relevance of behavioral strategy, as well as the field's immense heterogeneity. There were some exceptional papers among the submissions—more than could be published in the Special Issue. In reviewing submissions, in addition to the usual standards of contribution, method, and style, we gave priority to papers with strong links to psychology and papers that presented novel ideas, rather than extensions or restatements of ideas published elsewhere. In some cases, we referred papers to the normal *SMJ* review process.

We would like to express our sincere gratitude to all those who submitted papers to the Special Issue. We were delighted and overwhelmed by the response, and we appreciate the patience of authors, especially those whose papers we could not publish. We also want to thank the many scholars who gave generously of their time and energies to review papers for the Special Issue.

We aimed to use three reviewers on each paper, and we recognize that the volume of papers placed unusual demands on our colleagues in behavioral strategy. Finally, we are grateful for the sage advice and support of Rich Bettis, who served as our *SMJ* advising editor. Rich's availability and encouragement were much appreciated.

In the end, we accepted the nine papers that appear in this volume. We believe each of them makes a distinctive contribution to behavioral strategy. The papers cover diverse topics and methods, but also demonstrate the potential for a more unified field of behavioral strategy. Some of the papers use multiple methods, others point the way to new topics and methods, and each of them addresses one or more of the core problems in behavioral strategy.

The paper by Huy (2011) uses social identity theory to show how individual emotions scale to groups and organizations and shows the consequences of collective emotions for strategy implementation. The author's field study in a large Canadian service firm illustrates how a psychological mechanism such as identification can bridge the gap between individual psychology and organizational strategy.

Dysfunctional learning regimes can lead to firm inefficiency even when the firm and its employees do not commit cognitive errors. Markle (2011) uses a simulation method to study this problem in the context of employees' responses to wage changes. The paper shows that the existence of employees who do not respond to wage hikes causes firms to underestimate the output of high-effort employees and, hence, to set inefficient wages. This model has many applications in strategic management and represents a new wave of research linking individual and organizational learning.

Hu, Blettner, and Bettis (2011) combine reference point theory with the behavioral theory of the firm to produce a two reference point model of adaptive aspirations. Using simulations, the authors examine three strategies for adjusting aspirations—conservative, ambitious, and satisfying—and find that the latter yields better outcomes. This paper shows the benefits of combining Reductionist and Pluralist approaches to improve our understanding of long-standing problems in strategic management.

Bingham and Eisenhardt (2011) conducted a field study of organizational learning in six

entrepreneurial firms. The question concerned what organizations learn and how they do it. The authors argue from the data that what organizations learn are portfolios of heuristics, and that these heuristics follow a specific developmental sequence of events. The authors identify the heuristics and sequences, and link them to collective learning, memory and capability development.

Bardolet, Fox, and Lovallo (2011) combine field evidence with experimental methods to examine the cognitive biases of corporate resource allocation. The authors find that diversified firms show a persistent bias toward allocating capital equally across business units, no matter how the units are partitioned—in effect, cross-subsidizing low-performing units with the profits of high performers. By eliminating noncognitive explanations, the authors reveal the psychological foundations of a critical source of corporate inefficiency.

Two papers are linked to recent developments in cognitive neuroscience. Powell (2011) evaluates the prospects of behavioral neuroscience for contributing to behavioral strategy. Powell identifies the potential contributions and limitations of neuroscience and shows how research in neurostrategy may lead to useful interdisciplinary collaborations and innovations in theory development, construct validation, measurement, and strategy practice.

Hodgkinson and Healey (2011) employ a model in social cognitive neuroscience—controlled vs. automatic processing—to challenge the assumptions and conclusions of dynamic capability theory. The authors argue that emotion and intuition play essential roles in building individual and collective capabilities and suggest ways of aligning strategy theory with models of capability development in cognitive neuroscience.

We conclude the Special Issue with a commentary by Daniel Levinthal (2011) entitled 'A behavioral approach to strategy—what's the alternative?' He argues that sharp distinctions between rational and nonrational strategy are unhelpful. The world is neither one nor the other, and what really matters in strategy is whether models help people solve the problems they face as scholars and strategy practitioners. In Levinthal's (2011) words, 'the choice is not between whether we should act in a God-like manner or like mortals. We are mortals.' Ultimately, Levinthal argues, we need models that solve the problems faced by thinking and feeling human beings, and this requires a robust and dynamic field of behavioral strategy.

On that point we agree, and we hope you enjoy the Special Issue.

REFERENCES

- Abrahamson E. 1991. Managerial fads and fashion: the diffusion and rejection of innovations. *Academy of Management Review* **16**: 586–612.
- Argote L, Greve HR. 2007. A *Behavioral Theory of the Firm*—40 years and counting: introduction and impact. *Organization Science* **18**(3): 337–349.
- Arkes HR. 1991. The costs and benefits of judgment errors: implications for debiasing. *Psychological Bulletin* **110**: 486–498.
- Ashforth BE, Mael F. 1989. Social identity theory and the organization. *Academy of Management Review* **14**: 20–39.
- Bandura A. 1977. *Social Learning Theory*. Prentice-Hall: Englewood Cliffs, NJ.
- Barber BM, Heath C, Odean T. 2003. Good reasons sell: reason-based choice among group and individual investors in the stock market. *Management Science* **49**(12): 1636–1652.
- Bardolet D, Fox CR, Lovallo DA. 2011. Corporate capital allocation: a behavioral perspective. *Strategic Management Journal* **32**(13).
- Barnard CI. 1938. *The Functions of the Executive*. Harvard University Press: Cambridge, MA.
- Barney JB. 1986. Strategic factor markets: expectations, luck, and business strategy. *Management Science* **32**(10): 1231–1241.
- Bazerman MH, Moore D. 2008. *Judgment in Managerial Decision Making* (7th edn). Wiley & Sons: Hoboken, NJ.
- Bendersky C, McGinn KL. 2010. Open to negotiation: phenomenological assumptions and knowledge dissemination. *Organization Science* **21**(3): 781–797.
- Bertrand M, Mullainathan S. 2001. Are CEOs rewarded for luck? The ones without principals are. *Quarterly Journal of Economics* **116**: 901–932.
- Bingham CB, Eisenhardt KM. 2011. Rational heuristics: the ‘simple rules’ that strategists learn from process experience. *Strategic Management Journal* **32**(13).
- Blake RR. 1959. Psychology and the crisis of statesmanship. *American Psychologist* **14**(2): 87–94.
- Bollaert H, Petit V. 2010. Beyond the dark side of executive psychology: current research and new directions. *European Management Journal* **28**: 362–376.
- Bougon M, Weick KE, Binkhorst D. 1977. Cognition in organizations: an analysis of the Utrecht Jazz Orchestra. *Administrative Science Quarterly* **22**(4): 606–639.
- Bower JL. 1970. *Managing the Resource Allocation Process*. Harvard Business School Press: Boston, MA.
- Bromiley P. 2005. *The Behavioral Foundations of Strategic Management*. Blackwell Publishing: Malden, MA.
- Bromiley P. 2009. A prospect theory model of resource allocation. *Decision Analysis* **6**(3): 124–138.
- Bromiley P, Papenhausen C. 2003. Assumptions of rationality and equilibrium in strategy research. *Strategic Organization* **1**(4): 413–437.
- Brunsson N. 1982. The irrationality of action and action rationality: decisions, ideologies, and organizational action. *Journal of Management Studies* **19**(1): 29–44.
- Camerer CF. 2003. *Behavioral Game Theory: Experiments in Strategic Interaction*. Princeton University Press: Princeton, NJ.
- Camerer CF, Loewenstein GF, Prelec D. 2005. Neuroeconomics: how neuroscience can inform economics. *Journal of Economic Literature* **43**: 9–64.
- Camerer CF, Lovallo D. 1999. Overconfidence and excess entry: an experimental approach. *American Economic Review* **89**(1): 306–318.
- Cohen WM, Levinthal DA. 1990. Absorptive capacity: a new perspective on organizational learning. *Administrative Science Quarterly* **35**: 128–152.
- Cyert RM, March JG. 1963. *A Behavioral Theory of the Firm*. Prentice-Hall: Englewood Cliffs, NJ.
- DeLong JB, Shleifer A, Summers LH, Waldmann RJ. 1991. The survival of noise traders in financial markets. *The Journal of Business* **64**(1): 1–19.
- Denrell J. 2004. Random walks and sustained competitive advantage. *Management Science* **50**: 922–934.
- Denrell J. 2008. Superstitious behavior as a byproduct of intelligent adaptation. In *The Oxford Handbook of Organizational Decision Making*, Starbuck WH, Hodgkinson G (eds). Oxford University Press: Oxford, U.K.: 271–286.
- Denrell J, Fang C. 2010. Predicting the next big thing: success as a signal of poor judgment. *Management Science* **56**(10): 1653–1667.
- Denrell J, Fang C, Winter SG. 2003. The economics of strategic opportunity. *Strategic Management Journal* **24**(10): 977–990.
- Denrell J, March JG. 2001. Adaptation as information restriction: the hot stove effect. *Organization Science* **12**(5): 523–538.
- Donaldson L. 2010. *The Meta-Analytic Organization: Introducing Statistico-Organizational Theory*. ME Sharpe: New York.
- Drucker PF. 1974. *Management: Tasks, Responsibilities, Practices*. Harper & Row: New York.
- Duhame IM, Schwenk CR. 1985. Conjectures on cognitive simplification in acquisition and divestment decision making. *Academy of Management Review* **10**(2): 287–295.
- Dutton JE, Dukerich JM, Harquail CV. 1994. Organizational images and member identification. *Administrative Science Quarterly* **39**(2): 239–263.
- Edwards W. 1954. The theory of decision-making. *Psychological Bulletin* **51**(4): 380–417.
- Edwards W. 1961. Behavioral decision theory. *Annual Review of Psychology* **12**: 473–498.
- Eisenhardt KM, Zbaracki MJ. 1992. Strategic decision making. *Strategic Management Journal* Winter Special Issue **13**: 17–37.
- Elfenbein HA. 2007. Emotion in organizations: a review and theoretical integration. *Academy of Management Annals* **1**(1): 315–386.

- Elster J. 1982. The case for methodological individualism. *Theory and Society* **11**(4): 453–482.
- Fehr E, Tyran JR. 2005. Individual irrationality and aggregate outcomes. *Journal of Economic Perspectives* **19**(4): 43–66.
- Festinger L. 1954. A theory of social comparison processes. *Human Relations* **7**: 117–140.
- Fiegenbaum A, Hart S, Schendel D. 1996. Strategic reference point theory. *Strategic Management Journal* **17**(3): 219–235.
- Fiol M. 1991. Managing culture as a competitive resource: an identity-based view of sustainable competitive advantage. *Journal of Management* **17**: 191–211.
- Fiske ST, Taylor SE. 2008. *Social Cognition: From Brains to Culture*. McGraw-Hill: New York.
- Freeman J. 1999. Efficiency and rationality in organizations. *Administrative Science Quarterly* **44**(1): 163–175.
- Gavetti G, Levinthal DA, Ocasio W. 2007. Neo-Carnegie: the Carnegie School's past, present, and reconstructing for the future. *Organization Science* **18**: 523–536.
- Gawande A. 2009. *The Checklist Manifesto: How to Get Things Right*. Metropolitan Books: New York.
- Greve HR. 1998. Performance, aspirations, and risky organizational change. *Administrative Science Quarterly* **44**: 58–86.
- Hambrick DC, Mason PA. 1984. Upper echelons: the organization as a reflection of its top managers. *Academy of Management Review* **9**(2): 193–206.
- Harris SG. 1994. Organizational culture and individual sensemaking: a schema-based perspective. *Organization Science* **5**(3): 309–321.
- Haslam SA. 2004. *Psychology in Organizations: The Social Identity Approach* (2nd edn). Sage: Thousand Oaks, CA.
- Heath C, Larrick RP, Klayman J. 1998. Cognitive repairs: how organizations compensate for the shortcomings of individual learners. *Research in Organizational Behavior* **20**: 1–37.
- Henrich J, Boyd R, Bowles S, Camerer C, Fehr E, Gintis H (eds). 2004. *Foundations of Human Sociality: Economic Experiments and Ethnographic Evidence from Fifteen Small-Scale Societies*. Oxford University Press: Oxford, U.K.
- Hodgkinson GP. 2008. Strategic management. In *Introduction to Work and Organizational Psychology: A European Perspective* (2nd edn), Chmiel N (ed). Blackwell: Oxford, U.K.; 329–350.
- Hodgkinson GP, Healey MP. 2008. Cognition in organizations. *Annual Review of Psychology* **59**: 387–417.
- Hodgkinson GP, Healey MP. 2011. Psychological foundations of dynamic capabilities: reflexion and reflection in strategic management. *Strategic Management Journal* **32**(13).
- Hodgkinson GP, Langan-Fox J, Sadler-Smith E. 2008. Intuition: a fundamental bridging construct in the behavioral sciences. *British Journal of Psychology* **99**: 1–27.
- Hodgkinson GP, Maule AJ, Bown NJ. 2004. Causal cognitive mapping in the organizational strategy field: a comparison of alternative elicitation procedures. *Organizational Research Methods* **7**: 3–26.
- Hodgkinson GP, Sparrow PR. 2002. *The Competent Organization: A Psychological Analysis of the Strategic Management Process*. Open University Press: Buckingham, U.K.
- Hogg MA, Terry DJ. 2000. Social identity and self-categorization processes in organizational contexts. *Academy of Management Review* **25**(1): 121–140.
- Howard N. 1993. The role of emotions in multi-organizational decision making. *Journal of the Operational Research Society* **44**(6): 613–623.
- Hu S, Blettner D, Bettis RA. 2011. Adaptive aspirations: performance consequences of risk preferences at extremes and alternative reference groups. *Strategic Management Journal* **32**(13).
- Huber GP, Lewis K. 2010. Cross-understanding: implications for group cognition and performance. *Academy of Management Review* **35**(1): 6–26.
- Huy QN. 1999. Emotional capability, emotional intelligence, and radical change. *Academy of Management Review* **24**(2): 325–345.
- Huy QN. 2011. How middle managers' group-focus emotions and social identities influence strategy implementation. *Strategic Management Journal* **32**(13).
- Isenberg D. 1986. Group polarization: a critical review and meta-analysis. *Journal of Personality and Social Psychology* **50**: 1141–1151.
- Janis IL. 1972. *Victims of Groupthink*. Houghton-Mifflin: Boston, MA.
- Janis IL, Mann L. 1977. *Decision Making: A Psychological Analysis of Conflict, Choice, and Commitment*. Free Press: New York.
- Johnson EJ, Shu S, Dellaert BGC, Fox CR, Goldstein DG, Häubl G, Larrick RP, Peters E, Payne JW, Schkade D, Wansink B. 2011. Beyond nudges: tools of a choice architecture. Unpublished manuscript, Columbia University.
- Jonsson S, Regner P. 2009. Normative barriers to imitation: social complexity of core competences in a mutual fund industry. *Strategic Management Journal* **30**(5): 517–536.
- Kahneman D, Klein G. 2009. Conditions for intuitive expertise: a failure to disagree. *American Psychologist* **64**(6): 515–526.
- Kahneman D, Lovallo D. 1993. Timid choices and bold forecasts: a cognitive perspective on risk-taking. *Management Science* **39**(1): 17–31.
- Kahneman D, Slovic P, Tversky A. 1982. *Judgment Under Uncertainty: Heuristics and Biases*. Cambridge University Press: New York.
- Kahneman D, Tversky A. 1979. Prospect theory: an analysis of decisions under risk. *Econometrica* **47**: 313–327.
- Kets de Vries MFR, Miller D. 1984. Neurotic style and organizational pathology. *Strategic Management Journal* **5**(1): 35–55.
- Klein G. 1998. *Sources of Power: How People Make Decisions*. MIT Press: Cambridge, MA.
- Lant T, Baum J. 1995. Cognitive sources of socially constructed competitive groups: examples from the

- Manhattan hotel industry. In *The Institutional Construction of Organizations*, Scott WR, Christensen S (eds). Sage: Thousand Oaks, CA; 15–38.
- Larrick RP. 2004. Debiasing. In *Blackwell Handbook of Judgment and Decision Making*, Koehler DJ, Harvey N (eds). Blackwell: Malden, MA; 316–337.
- Latane B, Williams K, Harkins S. 1979. Many hands make light the work: the causes and consequences of social loafing. *Journal of Personality and Social Psychology* **37**: 822–832.
- Lawrence PR, Lorsch JW. 1967. Differentiation and integration in complex organizations. *Administrative Science Quarterly* **12**: 1–30.
- Levinthal DA. 1991. Random walks and organizational mortality. *Administrative Science Quarterly* **36**: 397–420.
- Levinthal DA. 2011. A behavioral approach to strategy—what's the alternative. *Strategic Management Journal* **32**(13).
- Levinthal DA, March JG. 1993. The myopia of learning. *Strategic Management Journal*, Winter Special Issue **14**: 95–112.
- Lippman SA, Rumelt RP. 1982. Uncertain imitability: an analysis of interfirm differences in efficiency under competition. *Bell Journal of Economics* **13**: 418–438.
- Lippman SA, Rumelt RP. 2003. A bargaining perspective on resource advantage. *Strategic Management Journal* **24**(11): 1069–1086.
- Livingood RS, Reger RK. 2010. That's our turf! Identity domains and competitive dynamics. *Academy of Management Review* **35**(1): 48–66.
- Lovallo D, Kahneman D. 2003. Delusions of success: how optimism undermines executives' decisions. *Harvard Business Review* **81**: 56–63.
- Lovallo D, Sibony O. 2010. The case for behavioral strategy. *McKinsey Quarterly*. March: 1–14.
- Luthans F, Youssef CM, Avolio BJ. 2007. *Psychological Capital: Developing the Human Competitive Edge*. Oxford University Press: Oxford, U.K.
- March JG. 1962. The business firm as a political coalition. *Journal of Politics* **24**(4): 662–678.
- March JG, Shapira Z. 1987. Managerial perspectives on risk and risk-taking. *Management Science* **33**(11): 1404–1418.
- March JG, Simon HA. 1958. *Organizations*. Wiley: New York.
- Markle AB. 2011. Dysfunctional learning in decision processes: the case of employee reciprocity. *Strategic Management Journal* **32**(13).
- Marschak J. 1955. Elements for a theory of teams. *Management Science* **1**(2): 127–137.
- Meyer JW, Rowan B. 1977. Institutional organizations: formal structure as myth and ceremony. *American Journal of Sociology* **83**: 340–363.
- Miles RE, Snow CC. 1978. *Organizational Strategy, Structure, and Process*. McGraw-Hill: New York.
- Mintzberg H, Ahlstrand B, Lampel J. 1998. *Strategy Safari: A Guided Tour of the Wilds of Strategic Management*. Free Press: New York.
- Moore DA, Oesch JM, Zietsma C. 2007. What competition? Myopic self-focus in market entry decisions. *Organization Science* **18**(3): 440–454.
- Nag R, Hambrick DC, Chen MJ. 2007. What is strategic management, really? Inductive derivation of a consensus definition of the field. *Strategic Management Journal* **28**(9): 935–955.
- Nickerson J, Zenger T. 2008. Envy, comparison costs, and the economic theory of the firm. *Strategic Management Journal* **29**(13): 1371–1394.
- Nisbett RE, Ross L. 1980. *Human Inference: Strategies and Shortcomings of Social Judgment*. Prentice-Hall: Englewood Cliffs, NJ.
- Ocasio W. 1997. Towards an attention-based view of the firm. *Strategic Management Journal*, Summer Special Issue **18**: 187–206.
- Oliver C. 1997. Sustainable competitive advantage: combining institutional and resource-based views. *Strategic Management Journal* **18**(9): 697–713.
- Ostrom E. 1997. A behavioral approach to the rational choice theory of collective action. *American Political Science Review* **92**(1): 1–22.
- Payne JW, Bettman JR, Johnson EJ. 1988. Adaptive strategy selection in decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition* **14**: 534–552.
- Pfeffer J, Sutton RI. 1999. *The Knowing-Doing Gap: How Smart Companies Turn Knowledge into Action*. Harvard Business School Press: Boston, MA.
- Porac JF, Thomas H. 1990. Taxonomic mental models in competitor definition. *Academy of Management Review* **15**: 224–240.
- Postrel S, Rumelt RP. 1992. Incentives, routines, and self-command. *Industrial and Corporate Change* **1**(3): 397–425.
- Powell TC. 2003. Varieties of competitive parity. *Strategic Management Journal* **24**(1): 61–86.
- Powell TC. 2004. Strategy, execution, and idle rationality. *Journal of Management Research* **4**(2): 77–98.
- Powell TC. 2011. Neurostrategy. *Strategic Management Journal* **32**(13).
- Powell TC, Lovallo D, Caringal C. 2006. Causal ambiguity and management perception. *Academy of Management Review* **31**(1): 175–196.
- Prahalad CK, Bettis RA. 1986. The dominant logic: a new linkage between diversity and performance. *Strategic Management Journal* **7**(6): 485–501.
- Priem RL, Cycota CS. 2001. On strategic judgment. In *Handbook of Strategic Management*, Hitt MA, Freeman RE, Harrison JS (eds). Blackwell Publishers: Oxford, U.K.; 493–519.
- Rafaeli A, Sutton RI. 1989. The expression of emotion in everyday life. *Research in Organizational Behavior* **11**: 1–42.
- Reger RK, Huff A. 1993. Strategic groups: a cognitive perspective. *Strategic Management Journal* **14**(2): 103–123.
- Rumelt RP. 1995. Inertia and transformation. In *Resources in an Evolutionary Perspective: Towards a Synthesis of Evolutionary and Resource-Based Approaches to Strategy*, Montgomery CA (ed). Kluwer Academic: Norwell, MA; 101–132.
- Russo JE, Schoemaker PJH. 2002. *Winning Decisions: Getting it Right the First Time*. Random House: New York.

- Ryall MD. 2003. Subjective rationality, self-confirming equilibrium, and corporate strategy. *Management Science* **49**: 936–949.
- Salancik GA, Meindl JR. 1984. Corporate attributions as strategic illusions of management control. *Administrative Science Quarterly* **29**(2): 238–254.
- Schelling TC. 1978. *Micromotives and Macrobehavior*. W.W. Norton & Company: New York.
- Schoemaker PJH. 1990. Strategy, complexity, and economic rent. *Management Science* **36**(1): 1178–1192.
- Schwenk CR. 1984. Cognitive simplification processes in strategic decision-making. *Strategic Management Journal* **5**(2): 111–128.
- Schwenk CR, Thomas H. 1983. Formulating the mess: the role of decision aids in problem formulation. *Omega* **20**: 10–20.
- Simon HA. 1987. Making management decisions: the role of intuitions and emotion. *Academy of Management Executive* **1**(1): 57–64.
- Soll JB, Larrick RP. 2009. Strategies for revising judgment: how (and how well) people use others' opinions. *Journal of Experimental Psychology: Learning, Memory, and Cognition* **35**: 780–805.
- Starbuck WH, Milliken FJ. 1988a. Challenger: fine-tuning the odds until something breaks. *Journal of Management Studies* **25**: 319–340.
- Starbuck WH, Milliken FJ. 1988b. Executives' perceptual filters: what they notice and how they make sense. In *The Executive Effect: Concepts and Methods for Studying Top Managers*, Hambrick DC (ed). JAI Press: Greenwich, CT; 35–65.
- Stasser G, Titus W. 1985. Pooling of unshared information in group decision making: biased information sampling during discussion. *Journal of Personality and Social Psychology* **48**(6): 1467–1478.
- Staw BM. 1981. The escalation of commitment to a course of action. *Academy of Management Review* **6**: 577–587.
- Staw BM, Barsade SG. 1993. Affect and managerial performance: a test of the sadder-but-wiser vs. happier-and-smarter hypotheses. *Administrative Science Quarterly* **38**(2): 304–331.
- Tajfel H (ed). 1978. *Differentiation Between Social Groups*. Academic Press: London, U.K.
- Terry DJ, Callan VJ. 1998. In-group bias in response to an organizational merger. *Group Dynamics: Theory, Research, and Practice* **2**(2): 67–81.
- Tetlock PE. 1990. Some thoughts on fourth-generational models of social cognition. *Psychological Inquiry* **1**(3): 212–214.
- Tetlock PE. 2000. Cognitive biases and organizational correctives: do both disease and cure depend on the politics of the beholder? *Administrative Science Quarterly* **45**(2): 293–326.
- Thaler RH, Sunstein CR. 2008. *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Yale University Press: New Haven, CT.
- Turner JC. 1975. Social comparison and social identity: some prospects for intergroup behavior. *European Journal of Social Psychology* **5**(1): 5–34.
- Tversky A, Kahneman D. 1974. Judgment under uncertainty: heuristics and biases. *Science* **185**: 1124–1131.
- Walsh JP. 1995. Managerial and organizational cognition: notes from a trip down Memory Lane. *Organization Science* **6**(3): 280–321.
- Wegner DM. 1987. Transactive memory: a contemporary analysis of the group mind. In *Theories of Group Behavior*, Mullen B, Goethals GR (eds). Springer-Verlag: New York; 185–208.
- Weick KE. 1995. *Sensemaking in Organizations*. Sage: Thousand Oaks, CA.
- Wildavsky A. 1972. The self-evaluating organization. *Public Administration Review* **32**(5): 509–520.
- Winter SG, Sterman J, Massey C, Lovallo D, Shapira Z, Denrell D, Fang C. 2008. Behavioral strategy: a research agenda. Symposium proposal, 2008 Academy of Management Annual Meeting, Anaheim, CA.
- Zajac EJ, Bazerman MH. 1991. Blind spots in strategic decision-making: the case of competitor analysis. *Academy of Management Review* **16**: 37–56.
- Zajonc RB. 1965. Social facilitation. *Science* **149**: 269–274.