

# The Behavioral Theory of the Firm: *Assessment and Prospects*

**GIOVANNI GAVETTI\***

*Harvard Business School*

**HENRICH R. GREVE**

*INSEAD*

**DANIEL A. LEVINTHAL**

*Wharton School, University of Pennsylvania*

**WILLIAM OCASIO**

*Kellogg School of Management, Northwestern University*

## **Abstract**

The Behavioral Theory of the Firm has had an enormous influence on organizational theory, strategic management, and neighboring fields of socio-scientific inquiry. Its central concepts have become foundational to any theoretical and empirical work focussed on organizational phenomena. Unlike past reviews of this work, we start by focusing less on reviewing these concepts than we do on discussing the new agenda they created for students

---

\*Corresponding author. Email: ggavetti@hbs.edu

of organizations and related subjects. We then explain the theoretical commitments implied by its agenda before we trace and evaluate progress on a set of research issues inspired by its agenda: cognition, performance feedback, politics, attention, learning, and adaptation. Finally, we offer a broader assessment of the theory by looking both at original ideas that have seen less developments and at modern developments in the field that deserve to be incorporated into the Behavioral Theory of the Firm. In the open-system spirit of the Behavioral Theory of the Firm, we conclude that its agenda will continue to benefit from work both by its closest adherents and by work in related research traditions.

### Introduction

In following *Administrative Behavior* (Simon, 1947) and *Organizations* (March & Simon, 1958), *A Behavioral Theory of the Firm* (Cyert & March, 1963) was the third of the three Carnegie School cornerstones of the foundations for the scientific study of firm behavior and administration. *A Behavioral Theory of the Firm* shares many of the preceding works' foundational ideas, but takes them into new organizational territories. It can thus be viewed as the most mature encapsulation of the early "Carnegie School" approach.

*A Behavioral Theory of the Firm* has been extraordinarily influential. Its foundational concepts, assumptions, and aspirations have inspired—and continue to inspire—a vibrant community of behaviorally oriented students of organizations and strategy (Argote & Greve, 2007; Gavetti, Levinthal, & Ocasio, 2007). For instance, Gavetti and Levinthal (2004) argued that the current mainstream strategy paradigm hinges on premises that date back to Cyert and March (1963), as well as Simon (1947) and March and Simon (1958). Similarly, Argote and Greve (2007) documented the wide and deep impact of early Carnegie school concepts on behavioral studies of organizations.

But can this influence continue? How can the premises, foundational concepts, and overarching aspirations of Simon, March and Cyert guide future inquiries into organizations and administration? How can they be used and developed to form the basis of a modern behavioral theory of management? In this article, we aspire to tackle these questions. To set the stage, we first lay out the principal premises of *A Behavioral Theory of the Firm* and its antecedents. We then open a window on later developments that we think have been especially meaningful in advancing the Carnegie program within and beyond its original boundaries. Such a list is inevitably somewhat idiosyncratic to our interests and perspective, nor is comprehensiveness an aspiration. However, despite these limitations, we hope that it can serve as a basis to identify promising directions for the Behavioral Theory of the Firm.

### Behavioral Agenda

Cyert and March (1963) noted at the outset that the conventional theory of the firm had a market-level focus on specific price and quantity outcomes and a tendency to favor aggregation and outcome (rather than process) explanations. While these features of the theory of the firm had been periodically criticized before, both critics and defenders of orthodox theory missed an important point: a theory developed to answer such aggregate outcome predictions is not appropriate for developing process explanations and micro-predictions. Thus, “there are a number of interesting questions relating specifically to firm behavior that the theory cannot answer and was not developed to answer, especially with regard to the internal allocation of resources and the process of setting prices and outputs” (Cyert & March, 1963, p. 16). Cyert and March thus did not view *A Behavioral Theory of the Firm* as a different answer to conventional questions; it was a call for answering a broader set of questions on firm behavior. But the questions of interests were not arbitrarily broad. Indeed, their other point of departure was the realization that, prior to *Administrative Behavior* and *Organizations*, organization theory had little concern for decision making and, in particular, the decision-making processes of business enterprises. As a result, a general theory of how fundamental decisions such as price and output decisions happen in organizations was missing. The call was then for research on “the fundamental decisions of the firm, decisions such as price, output, and resource allocation (...) and (...) an explicit emphasis on the actual process of decision making as its basic research commitment” (Cyert & March, 1963, p. 19).

It is easy to overlook the significance of the agenda-setting exercise in Cyert and March and, by extension, the preceding works in the Carnegie School. The call was for research that opens up the black box of the firm and accumulates theory and evidence on how a firm behaves as a result of lower-level processes, possibly involving individuals and groups, and certainly leading to observable decisions on economically important variables. *A Behavioral Theory of the Firm* was thus born with a commitment to theory across traditional levels of analysis, and to take a process view for the sake of predicting the reality of decisions (and their outcomes) rather than for its own sake. Because these commitments were so different from earlier research, Cyert and March also articulated a set of foundational concepts that served as solutions to the problem of constructing a Behavioral Theory of the Firm.

### Theoretical Foundations

Because “[d]ecision making is the heart of administration, . . . [t]he vocabulary of administrative theory must be derived from the logic and psychology of human choice” (Simon, 1947, p. xlv), and “administrative theory must be concerned with the limits of rationality, and the manner in which organizations

affect these limits for the person making a decision” (Simon, 1947, p. 241). These propositions vividly capture the Carnegie school’s prevailing theme: a realistic account of bounded rationality is pivotal to grasping the behavioral essence of organizations. Given this position, it is hardly surprising that the school’s foundational contributions are remembered for advancing a path-breaking conceptualization of bounded rationality. Perhaps more surprisingly, the key ideas of this conceptualization still very much inform the micro-foundational assumptions of contemporary organizational and strategy research of a behavioral bent. Cyert and March (1963) articulated these key ideas into a set of foundational concepts at the cognitive level, as well as a set of major relational concepts serving as theoretical mechanisms that specify how bounded rationality plays out in flesh and blood organizations.

#### *Cognitive Foundations*

Cyert and March introduce their cognitive assumptions as “A set of more frontal assaults on the assumptions [of the standard economic theory of the firm]” (Cyert & March, 1963, p. 8). This language captures the attitude towards classical economics that is the leitmotif of the early Carnegie school. In short, in order to grasp the psychological underpinnings of decision-making, it is not productive to consider local adaptations of or deviations from the rational-agent model’s unrealistic assumptions. It is necessary to build a model that mirrors the actual psychology of intendedly rational agents, which may be so at odds with the rational-agent model as to require that the core assumptions of this model are rewritten.<sup>1</sup> Critical to this position was the realization that because decision makers lack perfect knowledge and must search for information, their actions are usually inconsistent with the maximization postulate of the rational agent model. That is, they do not attempt to maximize; they follow instead different decision rules. It is in this spirit that the early Carnegie school’s cognitive foundations should be understood: what Simon (and then Cyert and March) realized was that understanding how decisions occur in organizations, and how organizations can achieve the ideal of “feasible rationality” requires an alternative to, not a variation of, the rational-agent model that was dominant in the economic theory of the time. The nature of this alternative can be encapsulated in three central postulates.

1. *Satisficing*. Individuals do not maximize. They satisfice. Roughly speaking, this means that they choose the first alternative they expect to be satisfactory. What is deemed “satisfactory” depends on an aspiration level, which in turn depends on a series of factors, most notably the history of prior performance.

2. *Search*. Simon defines the limits of rationality as the lack of “complete knowledge and anticipation of the consequences that will follow on each choice” (Simon, 1947, p. 81). Individuals are boundedly rational because

they know but a tiny fraction of the possible choice alternatives and their values. Therefore, different from what the rational-agent model posits, information or choice alternatives do not naturally flow to them. They need to be searched. That is why “the theory of choice and the theory of search become closely interwoven and take on a primary role in a general theory of decision making” (Cyert & March, 1963, p. 10). Satisficing operates not only with respect to the choice of a given alternative. Failures to achieve a satisfactory outcome trigger search processes. In this sense, search is *problemistic* in nature.

Search processes stop when an alternative is expected to be satisfactory. *Expectations* are therefore key to any decision process. As Cyert and March admit, their theory of expectations did not “reflect all of the recent efforts in the psychology of individual choice” (Cyert & March, 1963, p. 163). Rather, it relies on some simple “pattern-recognition variables (e.g. linear extrapolation) and the effect of hopes on expectations” (Cyert & March, 1963, p. 163). More broadly, it assumes that individuals tend to form very rough expectations in the initial phases of a decision process, thereby rejecting most alternatives. Their search then becomes more refined as just a few promising alternatives are selected.

3. *Rules, standard operating procedures, and status quo.* When uncertainty is significant, as in many firm decisions, and therefore the information required to make fully rational decisions is unavailable or difficult to obtain, individuals resort to coping mechanisms that spare them the need to anticipate distant futures. These mechanisms usually take the form of automatic rules (standard operating procedures in organizations) that are activated because of a crisis or a perceived problem (i.e. current performance falls below an aspiration level) in place of planning procedures or forecasting exercises. Rule-based behavior avoids foresight by exploiting the wisdom of experience. Indeed, rules tend to be simple in that they narrow search to “the neighborhood of the current symptom...and the neighborhood of the current alternative”, therefore “a cause will be found ‘near’ its effect and a new solution will be found ‘near’ an old one” (Cyert & March, 1963, p. 170).

All in all, bounded rationality leads to a representation of choice as a semi-automatic process that is informed by the past and operates in the present, in which calculation and distant forecasts do not have a role. Individuals (and firms) are rule-based actors who solve pressing problems, search their local environment, and adopt solutions that rarely violate the *status quo*.

### *Relational Concepts*

Cyert and March (1963) used four “relational concepts” that, together with the postulates described above, lead to the theoretical synthesis of a Behavioral Theory of the Firm: (1) quasi-resolution of conflict, (2) uncertainty avoidance, (3) problemistic search, and (4) organizational learning. Quasi-resolution of

conflict is the tendency of organizations to address different goals through coalitions that represent temporary compromises between different goals. The coalitions can involve tradeoffs between goal dimensions (logrolling) and discovery of mutually acceptable alternatives. They explicitly assumed that complete goal consistency would not usually be achieved: "Except at the operational level, there is no internal consensus. The procedures for 'resolving' such conflict do not reduce all goals to a common dimension or even make them internally consistent" (Cyert & March 1963, p. 117). This conception captures effects of organizational politics that have been noted by writers such as Dalton (1959) in a model of goal setting. Uncertainty avoidance is the tendency to choose decision rules that emphasize short-run responses to feedback, and hence require little forecasting, along with attempts to create a negotiated environment through coordination with interdependent actors. "In short, they achieve a reasonably manageable prediction by avoiding planning where plans depend on predictions on uncertain future events and by emphasizing planning where the plans can be made self-confirming through some control device" (p. 119). As mentioned earlier, problemistic search is motivated by the goal of overcoming performance shortfalls, directed by simple models of causality, and biased by organizational experiences and individual goals. Finally, organizational learning occurs when cycles of search and change lead to adaptation of goals, attention rules, and search rules through reinforcement of actions that organizational members interpret as having caused improvements. In the Behavioral Theory of the Firm, these four relational concepts were used to form a more behaviorally realistic approach to predict organizational action than the optimizing and equilibrium ideas of the traditional theory of the firm.

### Assessment of Research

#### *Cognition*

The micro-foundational sensibility of *A Behavioral Theory of the Firm* has had long-lasting consequences. The ideas it contains, together with that of related treatises of the Carnegie School, imprinted the development of a rich research tradition that spans work in economics (e.g. evolutionary economics), organization studies (e.g. organizational learning), and strategy (e.g. the capabilities paradigm, theories of attention, cognitive perspectives). These ideas still run deep in the foundational assumptions of much of this work. If it is striking that much of what was said back then is still modern and relevant, it is also to be expected that some of the original cognitive foundations have been revised or augmented in light of more recent developments in psychology and related disciplines. We briefly consider four developments that, to us, are particularly relevant.

*From standard operating procedures to routines.* As discussed above, the prevalence of standard operating procedures resulting from bounded rationality is a critical foundational concept in Cyert and March (1963). The contemporary management literature mostly equates standard operating procedures to routines (e.g. Eisenhardt & Martin, 2000; Feldman, 2000), but while Cyert and March (1963) analyze *specific* standard operating procedures, which are closer to the usage of Nelson and Winter (1982), they also evaluate more general decision rules, which imply a greater degree of mindfulness (Levinthal & Rerup, 2006), than the habitual action typically associated with routines. Decision rules imply bounded flexibility in organizational choices—some, but not all alternatives and decision criteria are considered.

While less studied than more habitual organizational routines, decision rules have been incorporated into the literature on strategic decision making and organizational adaptation. For example, Papadakis, Lioukas, and Chambers (1998) found in a study of strategic decision making, that decision rules were more consequential than top management characteristics or external or internal contextual factors. Ocasio (1999) found that CEO succession rules, both formal and informal, were primary determinants of the selection of insiders versus outsiders as CEOs. And decision rules have played an important role in studies of corporate renewal (Mezias & Glynn, 1993), as well as simulation models of organizational learning (Lant & Mezias, 1992), adaptation (Lant, 1992), and innovation (Repenning, 2002). Decision rules have also been posited as central to the development of dynamic capabilities (Teece, 2007).

The current focus on routines owes much to Nelson and Winter (1982), who built on Cyert and March (1963) but also had separate sources for the analysis of habit and tacit knowledge. Nelson and Winters' (1982) Chapter 4 ("Skills", which is an introduction to the psychology of individual habit) and Chapter 5 ("Organizational Capabilities and Routines", which is an introduction to collective routine) introduced the psychological underpinnings of individual habit and collective routine. In Chapter 4, Nelson and Winter discuss the psychological phenomenology of the skilled behavior of individuals. They focus on: (a) the programmatic nature of skills, the fact that they involve a sequence of steps with each successive step triggered by and following closely on the completion of the preceding one; (b) the tacit nature of the knowledge that accrues slowly, incrementally, and often implicitly through a learning process that results from the habitual repetition of complex tasks; (c) the unconscious nature of many of the decisions that the exercise of a complex skill might involve. Importantly, they link these attributes of individual habit to organizational routines: "We propose that individual skills are the analogue of organizational routines, and that an understanding of the role that routinization plays in organizational functioning is therefore obtainable by considering the role of skills in individual functioning" (Nelson & Winter,

1982, p. 73). A similar emphasis can be found, a few years later, in Levitt and March's (1988) seminal article on organizational learning, which sees organizational learning as "encoding inferences from history into routines that guide behavior" (p. 320). Their emphasis on routines leads to a theory of learning that sees the lessons from organizational history as retrievable in the form of routines, but not the history itself.

These contributions of Cyert and March (1963) and Nelson and Winter (1982) planted the seeds for two of the most prolific research programs in organization studies and strategy of the past two decades: the organizational learning research program in organization studies (see Miner & Mezias, 1996 for a review), and what has been dubbed the "capabilities paradigm" in strategy, which takes the construct of routine as the building block of "capability" (Dosi, Nelson, & Winter, 2000; Gavetti & Levinthal, 2004; Nelson & Winter, 2002). As a result, a number of important developments on both individual habit and collective routines ensued to fill a relevant gap in the early Carnegie proposal (Becker, 2008; Parmigiani & Howard-Grenville, 2011 offer reviews). Given our interest here on cognitive foundations, we would like to point out the important experimental studies by Cohen and Bacdayan (1994) and the subsequent work they inspired. This line of work captures the emergence of routines in a laboratory setting, and shows that individuals store the knowledge underlying the part of a routine they are responsible for in their "procedural memory". If routines are stored as distributed procedural memories, the properties of collective routines—both their strengths such as their reliability and speed in performing complex tasks, and their vulnerabilities, such as their "misfiring" when the problem suddenly changes—can be understood by gaining deeper knowledge about the properties of procedural memory. In addition to the cognitively oriented research, this research tradition has significant contributions through field research on routines using both quantitative (e.g. Aime, Johnson, Ridge, & Hill, 2010; Knott, 2003) and qualitative methods (Zbaracki & Bergen, 2010) to document the role of routines in providing capabilities, as well as mechanisms that generate change in routines.

All in all, this robust and extensive body of research deepens and extends the rule-based sensibility of early Carnegie writings. It offers a similar view of behavior (both at the individual and organizational level) as driven by semi-automatic, habit-based decision processes and action patterns. Here economic agents cannot reliably attain intelligence for decisions requiring anticipation of future environments, but they can learn to perform complex tasks reliably when they can exploit the power of local, short term, regular feedback, such as the development of standard operating procedures and routines. In this view, strategically relevant action is necessarily incremental. Superior performance rests on the attainment of superior capabilities that stem from the superior ability to manage learning processes that govern the development



of effective routines and changes to them when such changes are necessary for successful adaptation. Much of this literature sheds light on how these learning processes can be carried out.

*From expectations to representations.* Choice and action in organizations are not only reactive, rule-based, and incremental processes. They are not merely semi-automatic procedures that react to short-term problems, or failures to achieve historically determined aspiration levels. Important decisions often result from deliberate attempts to anticipate future environments. In Cyert and March (1963), the anticipation of future environments is analyzed in terms of organizational expectations. Expectations are derived from both organizational observations and interpretations of the environment. In Cyert and March (1963), expectations are conservative in nature, biasing the firm search toward local exploitation rather than distant exploration (Levinthal and March, 1993). Perhaps because of the Behavioral Theory's opposition against the rationality assumptions of standard economics, the anticipation of distant futures, or of the consequences of distant courses of action, is largely absent in the Behavioral Theory of the Firm.

Consistent with Cyert and March's sensibility, the role of organizational expectations or, more broadly, the role of an anticipatory logic has been relatively absent in more contemporary work in the Carnegie tradition. It is in response to this perceived gap and imbalance that a recent line of work has attempted to recuperate the dimensions of deliberation and anticipation in a context where routines, standard operating procedures, and local learning are relevant. Gavetti and Levinthal (2000) developed a model of search in which decision makers form simplified cognitive representations of their decision environment to anticipate, in approximate terms, the long-term implications of alternative courses of action. That is, in contrast to the dictum that economic agents avoid the requirement that they "correctly anticipate events in the distant future by using decision rules emphasizing short-run reaction to short-run feedback rather than anticipation of long-run strategies" (Cyert & March, 1963, p. 167), Gavetti and Levinthal (2000) depict decision makers that, while boundedly rational, can still anticipate the broad consequences of broadly defined courses of action thanks to rough, simplified cognitive representations of their environment. It is still true that agents avoid correct anticipations of future events, but their bounded rationality does not prevent them from coarsely foreseeing the consequences of alternative courses of action. Once decided, these courses of action act as templates that guide the subsequent trajectory of (local) search, and the related development of capabilities.

This conception of boundedly rational foresight can be viewed as the cognitive essence of strategic choice. It is in this spirit that Gavetti (2005) argues that the micro-foundations of the "capability paradigm" need to be extended

to account for the role of cognitive representations. How a strategist or a top-management team represents a given competitive setting affects what strategic position is ultimately pursued, which in turn determines what capabilities are developed. As a result, superior performance accrues not only from a superior ability to manage the learning processes underlying capability development; it also reflects the strategic leader's proper management of cognitive representations, and understanding what this entails needs to be placed at the center of the business strategy agenda.

In this spirit, the theme of anticipation, deliberation, and the centrality of cognitive representation has become a central theme in recent behavioral strategy work. For instance, Zollo and Winter (2002) have discovered that the articulation of the tacit knowledge embodied in routine operation (e.g. the formation of a cognitive representation of the relevant operational aspects of a routine) can help performance in subsequent evocations of the same routine in similar task environments. Relatedly, the recent and growing movement in strategy research toward redefining the micro-foundations of capabilities and routines reacts to the same imbalance we described above, and pursues an agenda in which the construct of cognitive representation plays a pivotal role (see Felin & Foss, 2005; Helfat & Peteraf, 2010 for example).

#### *Performance Feedback*

Problemistic search is one of the major relational concepts in the Behavioral Theory of the Firm, and it involved goals and expectations as central concepts. A cornerstone of the theory was a model in which performance below aspirations initiated search for solutions, but also adaptation of the aspiration level toward the actually experienced performance (Cyert & March, 1963, pp. 120–123). The literature on performance feedback (e.g. Greve, 1998) examines this tendency of low-performing organizations to strive more and expect less. Research on performance feedback has grown rapidly in recent years. A monograph reviewed early work on this topic (Greve, 2003a), so we limit our discussion to research done after 2003. Besides the basic propositions of problemistic search and adaptive aspiration levels, additional propositions in Cyert and March (1963) were (1) the solution is sought in the vicinity of the problem (symptom) and the existing actions, leading to a bias against distant and large changes to behaviors; (2) search is more likely to be triggered by quantitatively measurable goals; and (3) search is more likely to be triggered by goals that can be directly attributed to the actions of a given organizational unit.

There is significant evidence of organizational change occurring in response to performance feedback, as predicted by the main proposition, but the additional propositions mainly have indirect evidence. Because most studies

rely on overall performance measures such as return on assets or sales, which are top-level organizational goals, their research designs are better suited for predicting actions that top managers make than decisions taken at the sub-unit level. This has been recognized by researchers, as much work has been done on strategic changes such as mergers and acquisitions (Haleblian, Kim, & Rajagopalan, 2006; Iyer & Miller, 2008), growth (Audia & Greve, 2006; Desai, 2008; Greve, 2008, 2011), diversification (McDonald & Westphal, 2003; Shimizu, 2007), market position change (Park, 2007), and internationalization (Jung & Bansal, 2009). The research has found clear evidence that performance below the aspiration level increases the rate of change, as proposed in the Behavioral Theory of the Firm, and also of the more recent proposition that these effects are different depending on whether the performance is above or below the aspiration level (Greve, 1998).

There is validation of the idea that low performance is seen as a problem and a cause of search for top managers, as well as some insights on the processes triggered by low performance. CEOs are more likely to seek advice from other CEOs when doing poorly, though surprisingly the result of receiving advice is of greater persistence with the current strategy (McDonald & Westphal, 2003). Boards of directors increase their monitoring of CEOs when the firm performance is below the aspiration level, and this increase in monitoring is in part shown by a loss of CEO control over the board meeting agendas (Tuggle, Sirmon, Reutzel, & Bierman, 2010). These findings are clearly preliminary, and more work is needed to uncover whether CEOs initiate changes or are forced to make them.

Research and Development (R&D) expenditures and innovations have also interested researchers because these outcomes are highly consequential and thought to be dependent on top manager sponsorship, though they are typically done in subunits. For R&D, an additional point of interest is that it is a cost, so a straightforward way to increase ROA would be to decrease it. However, managers seeking to improve the organizational performance are more likely to look for product development as a search activity that can provide solutions, and hence to increase R&D and innovation launches. This prediction is supported (Chen & Miller, 2007; Chen, 2008; Giachetti & Lampel, 2010; Greve, 2003b, 2007; Vissa, Greve, & Chen, 2010). This research has also uncovered additional findings that support the Behavioral Theory of the Firm. First, the possibility that organizational search can be a mating process of problems and pre-existing solutions as much as a discovery of new solutions suggests that organizations with low performance may in fact imitate the innovations of others either as is or with some adaptation. This has been shown to occur (Massini, Lewin, & Greve, 2005; Schwab, 2007). Also, because innovations require resources, one may expect them to occur more frequently in organizations with low performance and high slack, and indeed this has been observed (Salge, 2011).

Recent work has also pushed into outcomes that are not so directly attributable to top management actions, even while maintaining the usual organization-level measures of performance. Organizational alliances are sensitive to performance relative to aspiration levels even though they are not necessarily made at the top level of the organization (Baum, Rowley, Shipilov, & Chuang, 2005; Schwab & Miner, 2008; Shipilov, Li, & Greve, 2011). A reasonable interpretation of these findings is that problemistic search can happen through top management endorsing either specific subunit actions or creating a climate for change, thus creating opportunities for subunit managers who are seeking to solve problems of their own.

The usual profitability measures such as ROA are too general to test the proposition that search occurs in the vicinity of the problem symptom, but some work on alternative goals has provided promising findings. Accidents are reduced in response to actual accidents relative to aspiration levels (Baum & Dahlin, 2007; Desai, 2010a; Madsen & Desai, 2010), product quality is influenced by quality reputation compared to aspiration levels (Rhee, 2009), and growth is adjusted in response to past growth relative to aspiration levels (Greve, 2008). Profitability also affected these outcomes (Baum & Dahlin, 2007; Madsen & Desai, 2010), and growth goals were only active when the organization had satisfied profitability goals (Greve, 2008). These findings are clearly in line with predictions. A key finding on the intermediate process is that resource allocation to the problem area follows low performance (Desai, 2010a, 2010b).

Direct evidence on whether changes in response to low performance are proximate to the current state of the organization is difficult to obtain without a metric of distance between the changed organization and the original one. A possible reason to expect such a finding is that there has been some work on the role of risk in moderating the effect of performance feedback, with organizations at risk financially instead becoming rigid when the performance is low. This proposition has been supported for acquisition of production assets, which is risky and is more likely to be done by large organizations below the aspiration level than by small ones (Audia & Greve, 2006; Greve, 2011). Also, large organizations are more likely to acquire qualitatively different assets than the old ones (Greve, 2011). Thus, search in the vicinity of current practices seems to be especially likely for organizations that are small or otherwise vulnerable.

Some investigations have ventured into outcomes that are not straightforward solutions to organizational problems, but may be affected by the performance just the same. A relation from performance to organizational fraud has been suggested, as organizations under pressure to obtain or retain satisfactory performance levels may resort to accounting violations or other misconduct (Greve, Palmer, & Pozner, 2010; Harris & Bromiley, 2007; Mishina, Dykes, Block, & Pollock, 2010). The findings are mixed because one study found

more violations below the aspiration level (Harris & Bromiley, 2007), while another found more when performance was above the aspiration level (Mishina et al., 2010). To resolve this contradiction, a closer analysis of the relation between the organizational performance and individual goals may be needed, pointing to a larger unsolved issue of how goals at different levels of analysis are linked together.

The work on performance feedback directly addresses the central issue of when performance shortfalls trigger organization change in areas ranging from strategies to specific operational areas. By linking change to organizational problems, as expressed through performance below the aspiration level, it provides an empirical foundation for models of learning, adaptation, and search that are an important part of the Behavioral Theory of the Firm. This research started by showing that problemistic search triggered by low profitability operates for relatively macro-outcomes, and has now moved on to explore a greater variety of goal variable and lower level outcomes. It has also started to tackle issues of myopia in search and goal hierarchies, which are likely to remain fruitful areas of investigation.

### *Politics*

The Behavioral Theory of the Firm including the relational concepts of quasi-resolution of conflict and uncertainty avoidance have had strong influence on theories of organizational politics and organizational attention. For example, resource dependence theory, as formulated by Pfeffer and Salancik (1978), not only develops from Emersons' (1962) exchange theory of power and dependencies but directly relies on Cyert and March (1963) for its view of the firm as a political coalition, resulting from the quasi-resolution of conflict, and for its emphasis on the negotiated environment, resulting from uncertainty avoidance.

While the view of the firm as a political coalition of members with distinct goals and interests (Cyert & March, 1963; March, 1962) has not developed into a separate and distinct theory, it has further influenced a variety of research approaches in organizational theory and strategy. Hambrick and Mason (1984) modified the coalitional view to focus on the demographics of the dominant coalition of senior managers, to develop the upper echelons or top management team perspective. Eisenhardt and Bourgeois (1988) studied the effects of observable political behavior among coalitions of managers in micro-computer firms. They found that centralization of power in the CEO was more likely to lead to political behavior, and that observable politics decreased performance.

A more direct application of the view of the firm as a political coalition has shaped the theory of circulation of power (Ocasio, 1994; Ocasio & Kim, 1999). Rather than viewing that power as institutionalized and entrenched by

individuals or organizational units (cf. Pfeffer, 1981), this theory posits that power is subject to obsolescence and contestation, as different individuals and functional groups compete for power over the organization's dominant coalition. Ocasio (1994) found evidence of the circulation of power in explaining executive succession in publicly held U.S. firms. Ocasio and Kim (1999) also found evidence of the circulation of power to explain the selection of CEO's functional backgrounds in Fortune 500 firms. Following power circulation theory, Shen and Cannella (2002) distinguished inside successors who followed CEO dismissals—contenders—from inside successors after CEO retirements—followers. Consistent with the theory, they found that senior executive succession following succession by contenders improves ROA, while succession by outsiders decreases ROA.

More recent applications of the theory of circulation of power further support the view of the firm as political coalition with divergent interests. Zhang (2006) finds that under conditions of low firm performance COO/Presidents acts as rival and contenders to the CEO increasing strategic change and CEO dismissal. Combs, Ketchen, Perryman, and Donahue (2007) combine the circulation of power with agency theory to explain how CEO power moderates the effects of board composition on performance. Jara-Bertin, López-Iturriaga, and López-de-Foronda (2008) examine how shifting coalitions between family shareholders and outside investors shape performance of European family-owned firms. Barron, Chulkov, and Waddell (2011) show that consistent with theory of circulation of power, succession by contender CEOs will lead to strategic change only when other inside members of the board are also replaced.

Cyert and March's coalitional view of organizations has shaped other research during the last decade. Fiss and Zajac (2004) examined how the heterogeneity of interests in German firms shaped the adoption of shareholder value orientation and increases the decoupling of adoption from implementation. Van Ees, Gabrielsson, and Huse (2009) emphasize that while decision making in corporate governance represents a coalition of members representing diverse interests, problems of coordination, exploration, and knowledge creation may dominate over problems of conflict of interest, exploitation, and the distribution of value. Weber, Rao, and Thomas (2009) combined coalitional perspectives with social movement theory in a study of biotechnology in German firms and find that external contestation weakened the position of internal champions of biotechnology, precipitated divisions among the dominant coalition, and undermined collective commitment to the technology.

#### *Attention*

The multi-actor view of the firm has also influenced theory and research on organizational attention. Building on Cyert and March (1963), as well as

Simon (1947) and March and Olsen (1976), Ocasio (1997) proposed an attention-based view of the firm. Here attention is shaped not only by organizational goals, but by the firm's formal and informal structures, issues, initiatives, and decision-making channels (Ocasio & Joseph, 2005). A key determinant of organizational attention is the power of key players, particularly the CEO and the senior executives. Levy (2005) found that firms were more likely to develop an expansive global strategy when their top management paid attention to diverse elements in their external environment. Cho and Hambrick (2006) combine upper echelons theory with the attention-based view by examining the attentional orientation of top management team (TMT) members in the airline industry post-regulation. They find that the effects of the TMT on strategic change were mediated by organizational attention. Relatedly, Marcel, Barr, and Duhaime (2011) examine how executive's cognitive orientations combine with environmental cues to shape organizational attention, interpretation, and response to rivals in the airline industry. Overall research has found that executive attention, as reflected in letters to shareholders, affects multiple outcome variables including technological responsiveness to competitors (Eggers & Kaplan, 2009), technological innovations (Kaplan, 2008), and speed of response to sector and task changes (Nadkarni & Barr, 2008).

The interplay between power, politics, and attention in organizations is developed by Bouquet and Birkinshaw (2008). They found that foreign subsidiaries gain attention from corporate headquarters in multinational firms partially based on the structural positions that subsidiary units occupy within a corporate system—their “weight”, as well as the influence behaviors—their “voice”. Similarly, Tuggle et al. (2010) examine how the allocation of attention to board monitoring is shaped by both performance and power. Consistent with behavioral and attentional theories, they find that negative deviations from prior firm performance increases allocation of attention to board monitoring and that CEO duality decrease it. They further find that CEO control over the agenda and the location of the meeting shapes board monitoring.

Organizational attention is shaped by top-down (e.g. goals and schemas) and bottom-up (e.g. situational and environmental factors) structures and processes (Ocasio, 2011). Beyond the effects of executive cognition, power and politics, top-down approaches have examined the effects of formal structure and processes. For example, Rosenkopf, Metiu, and George (2001) examined how joint participation in cooperative technical organizations increased attention to possibilities for alliance formations. Jacobides (2007) studies the effects of the division of labor and hierarchy on the attention of organizational units shaping how Greece nearly went to war with Turkey in 1996. The effects of strategic planning structures and processes on organizational attention have been explored by Ketokivi and Castañer (2004) and Ocasio and Joseph (2008).

While most research has focus on top-down attention, a few studies have examined either bottom-up processes (beyond performance feedback) or both. As an example of bottom-up attentional processes, Hansen and Haas (2001) found that given competition for attention in a knowledge market, suppliers who limited the amount of information they provided were more likely to be attended to, because a supplier who provided less information developed a reputation for quality and focus. More recently, Rerup (2009) integrated bottom-up and top-down approaches in his examination of attention to weak cues leading to catastrophic accidents. He developed a model of attentional triangulation, where attentional stability, vividness, and coherence shape organizational attention.

While the Behavioral Theory of the Firm focussed on internal determinants of organizational attention, macro-determinants of organizational attention have been examined from institutional theory and identity perspectives. Thornton and Ocasio (1999) and Thornton (2004) examined how changes in institutional logic from an editorial to a market logic shifted the determinants of executive succession and strategic decisions in higher education publishing firms. The consequences of institutional logics on organizational attention were further elaborated by Lounsbury (2007) in an examination of the interplay between competing logics and practice variation in mutual funds. Hoffman (1999) examined how event attention led to institutional change in the chemical industry. Hoffman and Ocasio (2001) examined how attention to external events was shaped by threats to industry image and identity and by external accountability. Nigam and Ocasio (2010) analyzed how attention to a critical event—Clinton's healthcare reform—led to changes in institutional logics despite the failure of the reform effort itself.

Overall theory and research on organizational politics and organizational attention, while directly and indirectly influenced by the initial formulation of the Behavioral Theory of the Firm, has developed by combining the original theory with other theoretical perspectives. Gavetti et al. (2007) highlighted a similar point in their call for a Neo-Carnegie perspective, which recognizes and integrates a variety of theoretical insights that have developed after *A Behavioral Theory of the Firm* and other treatises (*Administrative Behavior* and *Organizations*) traditionally associated with the Carnegie School tradition in organization theory.

### *Learning*

The Behavioral Theory of the Firm saw learning as a relational concept that included reinforcement of attention rules and search paths that proved successful in generating solutions (Cyert & March, 1963, pp. 123–125). However, a later article opened this view to also include learning from the external sources such as the experience of other organizations (Levitt & March,



1988). Much research has since followed that lead and has produced a research tradition too large to comprehensively discuss here (see Ingram, 2002; Miner & Anderson, 1999; Schulz, 2002 for reviews), but some strands deserve mention because they are particularly close to the Behavioral Theory of the Firm.

The emphasis on myopic search in Cyert and March (1963) naturally leads to the questions of what will constitute myopic search for a given organization (e.g. Rosenkopf & Nerkar, 2001; Stuart & Podolny, 1996), and more generally how an organization finds solutions to a given problem. Some work has supported a strengthened form of the imprinting hypothesis (Stinchcombe, 1965) by showing that founding teams set both initial strategies and subsequent search patterns of organizations (Beckman, 2006; Simons & Roberts, 2008). These findings are clearly relevant to the themes of coalitions and goal formation found in the Behavioral Theory of the Firm.

Other work has linked search to networks by showing that organizations benefit from having greater diversity of network ties to external actors (Baum, Calabrese, & Silverman, 2000; Beckman & Haunschild, 2002; Meeus, Oerlemans, & Hage, 2001) as well as better developed networks for internal sharing of knowledge (Darr, Argote, & Epple, 1995; Hansen, 2002; Schulz, 2001; Zander & Kogut, 1995). Network tie diversity at the individual level has a similarly beneficial effect (e.g. Brass, 1995; Mors, 2010), suggesting that the organization level effect may be a result of organizational members searching through their personal networks. However, one complication is that the internal network cohesion in work teams needs to be high in order for them to integrate diverse forms of knowledge (Reagans & Zuckerman, 2001; Taylor & Greve, 2006). Work on search direction thus offers intriguing connections between the individual, organizational, and network levels of analysis, and has significant potential for further development.

There is also work on how the content of the knowledge affects learning from the experience of others. A key question in that work is the extent to which learning from the experience of others involves re-invention or simple transfer (March, 1981). Interdependence among knowledge elements means that they may be inefficient unless adopted as a unit, possibly with some modification to fit the context (Knott, 2001; Szulanski & Jensen, 2006). In such cases, learning speeds may be significantly reduced by the degree to which the new knowledge has a tacit component, as well as by the turnover of the unit that seeks to learn (Barley, 1986; Edmondson, Winslow, & Bohmer, 2003). Even non-tacit knowledge can pose learning challenges if it is complex (Haunschild & Sullivan, 2002). Learning through creation and modification of rules also runs into a complexity barriers, as the creation of new rules becomes adversely affected by the number of prior rules at some point (March, Schulz, & Zhou, 2000). As these remarks suggest, work on the knowledge content is heterogeneous, as it involves scholars from a learning perspective along with strategy scholars and scholars of intra-organizational work processes. It has produced a

series of interesting findings, and can inform research on organizational routines by giving more detail on how routines and their underlying knowledge are formed and move across organizations.

### *Adaptation*

In the Behavioral Theory of the Firm, organizational learning is often seen as an integrating concept that has inspired thinking about the adaptive consequences of the mechanisms developed in the theory and supported by empirical research. Cyert and March note that organizations are “complex systems” and the formal model they develop is consistent with that characterization as it is comprised of a set of interdependent decision rules, responding to both external feedback and to internal reinforcement, such as the formulation of sales expectations. However, the set of interactions are rather structured and there is not a strong sense of emergent macro-behavior from micro- processes, a hallmark of current views of complex adaptive systems (Axelrod & Cohen, 1999; Miller & Page, 2007). The Garbage Can model (Cohen, March, & Olsen, 1972) is arguably the first incarnation of what would be generally viewed as a model of organizations as complex adaptive systems. The Garbage Can model characterizes distinct flows of local action (participants migrating to different decision contexts and solutions as well shifting their loci). What tends to be somewhat underappreciated in this model, perhaps as result of the use of the term “Garbage” in the descriptor, is that the analysis examined a wide array of organizational structures. It allows for settings with randomly distributed access of people and solutions, to highly structured settings with a strong hierarchy in which certain actors have access to a wide range of decisions while others have a quite narrow range, and settings with highly specialized structures, what Simon (1962) would term nearly decomposable, in which certain subsets of actors have access to some subdomain of the problem space and not others. The emergent patterns of decision making (resolution, oversight, and flight) are a consequence of the interaction, including a significant random component, and are not readily predictable from the micro-processes and decision structures themselves—again, a “signature” of models of complex adaptive systems (Axelrod & Cohen, 1999; Miller & Page, 2007).

An important feature of adaptive systems that has been highlighted by subsequent work is the interdependence of adaptive mechanisms. For instance, rapid learning of goals can be a substitute for the adaptation of strategies (Lave & March, 1976; Levinthal & March, 1981). Levinthal and March (1981) extends this interplay to consider the simultaneous adaptation of aspirations, strategy, and competence. Rapid competence learning may cause an inherently inferior alternative appear to be preferred and result in a “competence trap”. More generally, as Levinthal and March (1993) note, learning processes are often myopic in that feedback that is more proximate in time

and space (location within the organization) tends to dominate adaptive processes.

The potential dangers of rapid learning are developed in March (1991) where he introduced the important notion of an exploration/exploitation tradeoff into the organizations literature. As March (1991) noted, this general tension in evolutionary systems had been featured in models of complex adaptive systems in the computational sciences (Holland, 1975). Rapid learning at the individual level is unambiguously good. However, from the perspective of the organization, rapid individual learning may prove dysfunctional as it reduces the variety of beliefs within the organization that is critical for the long-run evolutionary dynamics of the organization. The multi-armed bandit model is the canonical representation of the exploration–exploitation problem across literatures as diverse as economics and statistics (Berry & Fristedt, 1985; Gittins, 1979; Robbins, 1952) and computer science (Holland, 1975; Sutton & Barto, 1998). In the management literature, March (1991) originally formulated his analysis in terms of a specific form of a genetic algorithm<sup>2</sup>; subsequently, he reformulated his discussion of learning in terms of the bandit model (Denrell & March, 2001; March 1996, 2003, 2010).

March (1991) lays out the basic tension between exploration and exploitation. This contrast not only presents challenges to empirical researchers seeking to specify the diverse mechanisms that might correspond to these constructs (cf., Gupta, Smith, & Shalley, 2006), but it poses conceptual challenges as well. It is important to recognize the distinction between exploration as a strategy, versus exploration as a set of behaviors, which in turn are mediated by the organization's set of beliefs (Posen & Levinthal, forthcoming). Consider an organization that has a strategy of being relatively exploratory but has rather firm beliefs as to what constitutes an appropriate course of action. Such an organization may engage in more exploitative behavior than an organization with a more exploitative strategy but widely diffuse beliefs as to what constitutes the appropriate course of action.

The linkage of beliefs and sampling processes is brought to the fore in a line of recent work (Denrell & March, 2001; Le Mens & Denrell, 2011). Since an adaptive organization is naturally going to sample alternatives for which it has more positive beliefs, then beliefs that are in some sense a “false positive”, a not particularly promising alternative viewed favorably, will ultimately be corrected. However, a “false negative”, a latently promising alternative that is viewed unfavorably, will be unlikely to be sampled and this inaccurate negative belief will persist, despite the organization being nominally adaptive.

As Simon (1962) noted, a central feature of a complex system is the degree of interdependency among its elements. This property and its implications have been highlighted in a recent line of work that builds on Kauffmans' (1993) model of so-called rugged fitness landscapes. Levinthal (1997) shows how path-dependence, and in turn, persistent organizational heterogeneity

may stem from the fact that payoff to an organization's set of policy choices may have strong interdependencies. These interdependencies result in local peaks in the fitness landscape which consist of an internally consistent set of policy choices, but a set of choices possibly inferior to other configurations available to the organization. However, because of the internal consistency of these inferior local peaks, incremental efforts at adaptation will not lead the organization to abandon this set of choices. To escape such local peaks, the organization may try to adopt the practices of other higher-performing organizations with the associated risks of imperfect imitation, risks made more pronounced by the degree of interdependencies among the policy choices (Rivkin, 2000). Alternatively, the organization may have some crude cognitive representation of the broader landscape and make a choice to move to a more distant location based on that representation (Gavetti & Levinthal, 2000). The cognitive leap may also be informed by the process of analogical reasoning (Gavetti, Levinthal, & Rivkin, 2005).

Subsequent work has examined the effect of alternative organizational structures on guiding search process. Marengo, Dosi, Legrenzi, and Pasquali (2000) and Ethiraj and Levinthal (2004) focus on the impact of problem decomposition and specialization of roles in systems that may have some measure of decomposability or modularity. Other work has focussed on the hierarchical structure of organizations, with Gavetti (2005) focusing on the role of possibly distinct cognitive representations of disparate actors within the organization. Rivkin and Siggelkow (2003) take on classic issues of organizational design, allocation of tasks, authority, and incentive structures, and examine how these mechanisms influence the breadth and persistence of organizational search processes. Christensen and Knudsen (2010) provide an analytical generalization of Sah and Stiglitz's (1986) work on organizational architecture, that permits one to consider the full range of possible organizational forms from polyarchy to pure hierarchy. Hierarchical forms require multiple levels of actors to approve an initiative before it can be acted upon, while a polyarchy allows individual actors to enact policies on their own. Knudsen and Levinthal (2007) explore the impact of alternative organizational forms for search through performance landscapes. Hierarchical organizational forms tend to be quite cautious and are very unlikely to make Type I errors of accepting inferior alternatives, but as a result of such caution tend to become trapped by local peaks. Hybrid forms, consisting of a mixture of polyarchy and hierarchy balance to some degree the dual imperatives of exploration and exploitation (Holland, 1975; March, 1991).

### Methods of Research

*A Behavioral Theory of the Firm* was a pioneering work in its view of organizational change as being a sequence of events driven by a set of learning

processes. This dynamic view was ahead of its time conceptually and methodologically, and hence researchers in this tradition have often needed to explore new methodologies. Currently a broad range of methodologies are available that fit this view of organizations, however, and it is possible that recent advances in methodology will allow researchers to revisit theoretical issues with greater methodological leverage than before. In the following, we note how the Behavioral Theory of the Firm has contributed to and benefited from simulations, case studies, experiments, and regression methods.

A notable feature of Cyert and March (1963) was the construction of a simulation model of pricing and volume decisions, with calibration against actual decisions in a field site. This demonstrated the usefulness of the theory as an integrative device and a good foundation for prediction. Later simulations took a slightly different tack, as they focussed on a narrower set of theoretical mechanisms and explored their effects on organizational behaviors and adaptive consequences. This led to a set of very influential simulation studies on organizational decision making (Cohen, et al., 1972) and search (Levinthal & March, 1981; March, 1991). These demonstrations of the implications of theoretical mechanisms have set the pattern for subsequent work using simulations in organization theory, and remain a strong tradition within the Behavioral Theory of the Firm.

Cyert and March (1963) also used case studies to inform their theoretical development. This method was important because the commitments to process-oriented theory and empirical foundations led to a need for observation of decision-making processes. Case studies have remained important for developing new theory in this tradition, and have helped advance the theory on organizational routines (e.g. Feldman, 2000; Pentland & Rueter, 1994), generate ideas on how organizations learn from unique failure events (Miner, Kim, Holzinger, & Haunschild, 1999; Rerup, 2009), and show that field-level attention shifts across issues (Hoffman, 1999). Case studies remain a very useful method in the Behavioral Theory of the Firm toolbox.

Cyert and March (1963) also used experimental work, and this has been followed up to explore selected issues in the Behavioral Theory of the Firm. Lant (1992) did important experimental work to verify the updating rule for aspiration levels specified by Cyert and March (1992), and Cohen and Bacdayan (1994) used an experiment to investigate the structure of routines. More complex experiments have been used to investigate decision making rules drawn from the Behavioral Theory of the Firm in experimental markets (e.g. Baum & Berta, 1999). Experiments are perhaps under-utilized as a source of new evidence on the Behavioral Theory of the Firm, especially when considering that social psychologists have run experiments using similar simulations of decision making and generating findings relevant to aspiration-level theory (Bandura & Jourden, 1991).

The Behavioral Theory of the Firm was late in using regression methods because its focus on organizational decisions and change events was a poor fit to early methods geared towards continuous dependent variables and data sets assembled to explain performance. The main contributions from such regression methods came in the work on learning-curve effects on costs (Argote, 1999). Once event-history methods for discrete and continuous time analysis became available, research using regression analysis surged forward in a number of areas. The performance feedback research relies on study of change events and a specific functional form of the performance effect (Greve, 1998). The work on rule changes uses event history methodology with clear inspiration from population ecology (March et al., 2000), and work on intra-organizational politics has used executive succession events and event-history methodology (Ocasio, 1994). Event-history methods form a useful and growing part of the methodological approaches for developing the Behavioral Theory of the Firm.

### Prospects for Research

The Behavioral Theory of the Firm has been an extraordinary success by any metric of impact on subsequent developments in organizational theory and strategic management. While it created a powerful foil for the standard neo-classical framework in economics, economists have been largely resistant to this set of ideas. For management researchers however, the impact continues. Research on organizational feedback and performance learning, in particular, continues to be directly influenced by the foundational concepts developed by Cyert and March (1963). More broadly research on cognition, routines, capabilities, attention, power, and adaptation, among many other subjects of inquiry, build on its foundations, often integrating with other related approaches. Despite these successes, there are areas in which the promise of the Behavioral Theory of the Firm has not been fully met, as well as areas in which new opportunities have opened up.

### *Integration*

First, some of the integrative theory of firm decision making and environmental adaptation that it developed has been lost. The Behavioral Theory of the Firm was more than the sum of its parts. Yet some parts have been underdeveloped (e.g. expectations, decision rules, multiple goals), and the interplay among others under examined (e.g. between organization and market forces). For example, the Behavioral Theory of the Firm was intended to create an organizationally rich and reasonably descriptive account of firm behavior as a basis for a consideration of organizational adaptation to environmental and market processes. The theory as a boundary object between

conceptualizations of market processes and intra-firm processes is still a largely unfilled opportunity as the focus of much of the descendent work considers the impact of environmental feedback on firm behavior but has been less concerned with the interplay among organizations. Indeed, this challenge, and the need to respond to it, is amplified by the broader pattern of a bifurcation of work on more micro-, intra-organizational processes and more macro-, sociological work on networks, fields, and broad institutional logics that is reflected to a considerable degree in contemporary work in organization theory.

There are some exceptions of work that take on the implications of a population of firms, conceptualized broadly along the lines of Cyert and March (1963), interacting in market-like processes. One such example is the line of work on the “Red Queen” (Barnett & Hansen, 1996). It models individual firms as being driven by a problemistic search process in an environment of other firms that are also driven by problemistic search. As a consequence, high levels of performance by some firms engender performance failures in other firms, prompting problem-driven search. An important point to recognize from the evolutionary dynamics of interacting behavioral entities is that such dynamics need not generate outcomes consistent with that generated by a set of optimizing entities (Carroll & Harrison, 1994). That is, it is not only the path that differs but realized endpoints differ as well. More recently, Gavetti (2011, 2012) sought to identify the cognitive roots of superior performance (and the corresponding role of strategic leaders) by linking the strength of competitive forces to the management of micro-level cognitive processes. The idea is that, assuming intense competition for the best strategic opportunities, some superior opportunities remain available (i.e. shielded from competition) because they are especially difficult to spot and/or pursue. In turn, such difficulties hinge to a large degree on the average strategic leader’s inability to manage some select mental processes. Viewed through this lens, superior performance can be cast as stemming from a superior ability to manage precisely the mental processes that make the identification and pursuit of superior opportunities difficult. Superior strategic leadership can be defined accordingly.

Another set of interactions occur between the firm and its institutional environment. Here, the Behavioral Theory of the Firm has the potential for making significant new contributions to a research tradition that often privileges environment-to-organization influences over those going in the other direction. While Thornton and Ocasio (1999) have examined the linkages between broader institutional forces and power dynamics within the organization, there seems to be an untapped opportunity to examine linkages from firm level mechanisms that may shape and influence the broader institutional environment. The Behavioral Theory of the Firm and institutional theory agree on the tendency of organizations to create a negotiated environment (Cyert &

March, 1963; Meyer & Rowan, 1977). Are they more likely to do so in response to performance below aspiration levels? Are they more likely to succeed if they have a more coherent internal coalition?

The potential for a fruitful exchange of ideas between the Behavioral Theory of the Firm and institutional theory seems especially high in the new and growing area of work on complex institutional environments (Greenwood, Raynard, Kodeih, Micelotta, & Lounsbury, 2011), defined as environments in which multiple institutional logics coexist and issue mutually inconsistent prescriptions. In such environments, the mapping of the structure of the institutional field onto organizational structures and behaviors is a result of organizational factors such as identity, governance, and structure (Greenwood et al., 2011), which in turn influence political processes of the kind suggested by Cyert and March (1963). This tradition already offers findings on organizational responses to inconsistency that can be interpreted through the lens of the Behavioral Theory of the Firm and used to assess and develop its theory of intraorganizational politics and quasi-resolution of conflict. Organizational adoption of conflicting practices has been documented (D'Aunno, Sutton, & Price, 1991; Pache & Santos, 2010; Shipilov, Greve, & Rowley, 2010), and so has a role of group interest and representation in their propagation in fields and organizations (Briscoe & Safford, 2008; Chung & Luo, 2008; Dunn & Jones, 2010).

The Behavioral Theory of the Firm can also grow by paying greater attention to the effects of the institutional environment. For example, the environmental influence on goals appears to be stronger now than when Cyert and March (1963) was written. The Behavioral Theory of the Firm was developed at a time where managerialist logics were prevalent in U.S. corporations. With the increasing rise of market logics and shareholder value orientations (Davis, 2009), assumptions such as satisficing may need to be reconsidered. Shareholders may now be more dominant players in the firm's political coalition, and profit motives may play an increased role. There is evidence that the effect of these goals differs across cultural spheres (e.g. Guillen, 1994) and is weaker in organizations within business group or family influence (Khanna & Rivkin, 2001; Lincoln, Gerlach, & Ahmadjian, 1996; Luo & Chung, 2005). However, it remains true, and not sufficiently captured in research, that the overall trend is for the institutions of shareholder power to spread internationally and provide more leverage against managers (Davis, 2009; Weber, Davis, & Lounsbury, 2009).

It has also been suggested that we need "A Behavioral Theory of the Inter-firm" (Baum & Ingram, 2002). Such a theory would maintain the central mechanisms and sensibilities of the Behavioral Theory of the Firm, but would focus on how connections among firms shape their actions and in turn are shaped by the firms. Although network research has a long tradition, the interface with the Behavioral Theory of the Firm is not well explored, and there are ample



research opportunities. The effects of interorganizational structures in shaping which organizations can learn from each other is one question that has seen some exploration (Beckman & Haunschild, 2002; Darr et al., 1995; Ingram & Baum, 1997). Viewing interorganizational structures as a source of control and comparison on goal dimensions is especially useful for examining groupings such as business groups (Vissa et al., 2010). Finally, the evolution of networks is now a strong research tradition that has yielded informative results on which organizations are more likely to establish ties (e.g. Gulati & Gargiulo, 1999; Lavie & Rosenkopf, 2006). This literature contains theory on what kinds of ties are likely to be valuable and enduring for the organization, but surprisingly it does not have a theory of search for ties beyond the idea that current ties and ties-of-ties are more familiar and hence easier to find. Here, ideas from the Behavioral Theory of the Firm may prove valuable. An interesting addition to the interfirm networks literature is work showing that establishment of ties depends on performance relative to goals, including goals with respect to the desired network position (Baum et al., 2005; Shipilov et al., 2010).

Central to the Behavioral Theory of the Firm is the distinction between outcomes that are encoded as being “successful” and those associated with “failure”. While as noted previously there has been a very vibrant line of work that has built on these ideas and, in particular, has developed considerable insight as to the bases and dynamics of aspiration levels, the focus has largely been on a “vertical” dimension, what constitutes an adequate level of performance, as opposed to the question of what constitutes the relevant performance metrics. The attention-based view developed by Ocasio (1997) highlights the importance of the plurality of goals. The shifting attention to different performance metrics has been shown to be critical in influencing whether firms adapt, or not, to shifting patterns of technological competition (Christensen, 1997).

Recognizing the plurality of goals also poses a possible challenge or enrichment of how we conceptualize the notions of exploration and exploitation. Acts that appear exploratory from one actor’s perspective, particularly those operating within established frameworks of what constitutes legitimate action or strategy, may appear to be exploitative from the perspective on the individual carrying out the initiative (Adner & Levinthal, 2008). In a similar spirit, recognizing that organizations typically have a nested hierarchy of superordinate and subordinate goals can help strengthen the linkages between the line of work on near-failures (March, Sproull, & Tamuz, 1991; Rerup, 2009) and the Cyert and March (1963) framework. The space shuttle Challenger arriving safely on earth was viewed reasonably as constituting a successful mission; the failure of the O-ring was a subsystem failure that was not viewed as impinging on the broader mission success (Vaughn, 1996).

The separation of micro-organizational level work at the individual or group level from macro-organizational work at the organization or organization-environment level has left a need for an integrative theory of intra-organizational behavior. The Behavioral Theory of the Firm could take on that role through reexamination of the role of standard operating procedures, both in the form of decision rules, formal and informal, and more routine forms of organizing. Organizational behavior is both routine and non-routine (Baum & Wally, 2003; Mohr, 1971; Perrow, 1967), yet non-routine behaviors and decisions are themselves structured and bounded. At the same time, routines are not only sources of habit and inertia, but sources of agency and organizational change (Feldman, 2000; Feldman & Pentland, 2003). They thus tie together individual initiative and organizational adaptation in ways that are not fully explored. Similarly, search through networks connect individual and subunit behaviors to a larger context, and may prove to be important for integrating these levels (Mors, 2010; Reagans & Zuckerman, 2001). Arguably the Behavioral Theory of the Firm is the intellectual tradition best positioned to tackle integration across levels because of its commitment to a realistic account of individual decision making along with process explanations for economically important firm decisions.

### *Extensions*

Strategy research has traditionally been divided between rational and behavioral views of strategy, with the latter being pivotal to the field's development during the past decade. Much of this work, which hinges on bounded rationality, is indebted to the Behavioral Theory of the Firm: its assumptions and theoretical foundations have their seeds in the Carnegie tradition. This development is an opportunity both to redefine the conceptual foundations of the strategy field and to push Carnegie thinking into previously neglected territories, especially in regard to formulating an explicitly behavioral theory of strategy (Gavetti, 2011). It is ironic that Cyert and March (1963) have so influenced a normative field-like strategy. They eschewed normative implications, especially those that rested on forward-looking rather than backward-looking behavior, and those that rested on distant rather than incremental or local processes of search and change. In contrast, Simon (1947) explored the possibility for organizational intelligence despite individual actors' bounded rationality. *A Behavioral Theory of the Firm* has given strategy and organization scholars a backward-looking, incremental sensibility that gives many useful insights on organizational change. For a fuller view, however, the field also needs to incorporate forward-looking decision making and actions made for distant and uncertain benefits. The work on representations mentioned at the outset (Gavetti & Levinthal, 2000), together with the recent ferment around micro-foundational questions (Felin & Foss, 2005) represents a significant step in this direction. It is

now time to address more fully central issues such as what causes representations to shift or remain static, how they can be acquired intelligently, and how they can be diffused effectively.

It is in this context that recent work emphasizes the need to gain deep insights about the associative properties of the human mind (Gavetti, 2011; Lovallo, Clarke, & Camerer, Forthcoming). Associative processes such as analogical thinking can be an intelligent basis to acquire appropriate representations of a problem, especially when new and complex (Holyoak & Thagard, 1996), thereby supporting strategic foresight when foresight is especially hard. For instance, an appropriate re-representation of an industry might allow seeing opportunities that were once invisible or unthinkable. Relatedly, if strategic leaders need to acquire novel cognitive representations in order to spot new strategic opportunities that are distant and hard to see through more standard lenses, they also need other relevant constituencies to embrace similar representations. As March (1981, p. 575) put it, “If a leader tries to march toward strange destinations, the organization is likely to deflect the effort”. The leader thus needs to persuade organizational members and other relevant constituencies external to the organization (e.g. capital lenders, customers, media, etc.) that her view of the world has merit. Similar to foresight, effective persuasion rests largely on the management of mental associations. Interpretation, the target of persuasion, is driven by categorization processes: any time a reality is presented to us, we associate it to similar realities we have experienced in the past or know about. We categorize it. Critical to persuasion is thus the ability to influence how other people categorize a reality of interest. Both analogies and categorization processes can be disciplined (Gavetti, 2011), but although we are gaining relevant insights on both processes, we are still distant from a robust prescriptive framework that is centered on these questions.

Even with its current focus on backward-looking behavior, the Behavioral Theory of the Firm has rich implications for understanding strategic action and economic outcomes. The neoclassical economic response to Cyert and March (1963) and related work is to acknowledge the presence of goal conflict but to maintain the field’s adherence to assumptions of individual level utility maximization and complete and common knowledge regarding the nature of individual and collective production processes within the firm. That is, contracting challenges may stem from incomplete information, typically the state of “nature” faced by an agent in particular circumstances and direct knowledge of the agent’s actions, but the understanding of the consequence of a given action in conjunction with a particular state of nature is shared and understood by all parties. Thus, the organizational economics literature provides a theory of the “second-best”, the optimum outcome constrained by the limits of incentive alignment (Gibbons, 2003).

But as the Behavioral Theory of the Firm suggests, cost positions, patterns of demand, let alone innovative possibilities are only poorly understood, and

particularly with respect to the later uncertainly, not well reducible to a probability distribution of well-posed possible states (March, 1978). It is worth pausing to consider the normative relevance of a paradigm that largely denies such features. Imagine that we eliminated the modifier “Behavioral” in the labeling of this line of inquiry. Suppose, as per the original Simon agenda, one wished to consider how to manage and design organizational structures based on how actors in organizations behave. Would not such an approach have a normative quality? Further, an incentive structure and other such arrangements that may have some optimality qualities in a world in which actors have a full understanding of the payoff structure of their environment and optimize with respect to that full understanding, need not have functional implications when applied to a set of actors who face a problem environment that exceeds their cognitive capacity (cf., Ethiraj & Levinthal, 2009). If one considered the problem of guiding intelligent organizational action as a pragmatic engineering problem, rather than a line of inquiry that should fit neatly into a particular social science discipline, with economics, sociology, and social psychology being the primary category candidates, the ideas laid out by Cyert and March would seem to be a promising basis for a Theory of the Firm.

### *Conclusion*

As March (2005, p. 18) observes, “a writer’s words and the language connecting them are not simply vessels of intended meaning; they evoke meaning unanticipated by the writer. . . . but one of the joys of scholarship is contemplating the ways that words, metaphors and models elaborate meanings outside the control of their author”. Cyert and March had an intended strategy of creating a conceptual and analytical structure that would provide the basis for a behaviorally grounded, firm-centered, examination of market phenomena. In some respects, as embodied in the line of research on Evolutionary Economics ala Nelson and Winter, there are ways in which this ambition has been fulfilled. However, the primary avenue of the “elaboration of meaning” has taken place within the organizations literature itself. Further, in the spirit of March’s remarks above, the Behavioral Theory of the Firm has existed as a kind of open system with respect to the broader field of management. Elements, such as aspiration-level learning, and the firm as a political coalition are refined and further developed but to a significant degree have speciated from the broader structure and content of the Behavioral Theory of the Firm itself.

There are a number of distinct manners in which we can see the research engendered by Behavioral Theory of the Firm evolve, both with regard to its more direct descendants and with respect to its broader influence. As we have noted, there have been and continue to be opportunities for lineage development within the different strands of the basic theoretical apparatus. It is also the case, per the open systems imagery, that these lineage developments may, in

various respects, benefit from incorporating developments that have occurred outside the Behavioral Theory of the Firm enterprise as was noted, for instance, in the discussion of the cognitive foundations and the linkage of institutional theory to issues of goal conflict and attention allocation. Success in an open-system sense also poses challenges to the future of the Behavioral Theory of the Firm as an integrated perspective. Elements of the underlying theory may diffuse, be elaborated, and become incorporated into various strands of the literature. However, what of the bold ambitions of the initial project? Would it be possible, or even useful, to articulate a contemporary, integrated expression of the Behavioral Theory of the Firm? Or, has the theory outgrown its capacity for integration? Would it be possible or even desirable, to extend this new articulation to include additional insights from the broader Carnegie School tradition (cf., Gavetti et al., 2007)?

The Behavioral Theory of the Firm has had deep resonance with the field of organizational theory, a resonance that continues to animate organizational scholars. The “openness” of the theoretical apparatus has ultimately, in our view, proved to be a source of strength, allowing a broad community of scholars to build on these ideas and offering opportunities for further enrichment of these ideas. At the same time, the core identity of the Behavioral Theory of the Firm has remained intact: a behaviorally grounded approach that treats bounded rationality, adaptive processes, and unresolvable goal conflict and ambiguity as foundational. How others will choose to build on and expand upon those foundations is not readily predictable, but the robustness and fecundity of these foundations make us optimistic and curious about the possibilities.

### Endnotes

1. In this sense, although the “behavioral revolution” that occurred in a variety of disciplines, including decision theory, economics, and finance, was influenced by Carnegie work (in particular, the relationship between Kahneman and Tversky’s early work and Simon’s), it should not be considered a descendant of Cyert and March (1963).
2. The model in March (1991) is a specific form of a genetic algorithm in the sense that individuals do not recombine attributes of other individuals directly, but rather they do so indirectly, mediated by the “organizational code.”

### References

- Adner, R., & Levinthal, D.A. (2008). Doing versus seeing: Acts of exploitation and perceptions of exploration. *Strategic Entrepreneurship Journal*, 2, 43–52.
- Aime, F., Johnson, S., Ridge, J.W., & Hill, A.D. (2010). The routine may be stable but the advantage is not: Competitive implications of key employee mobility. *Strategic Management Journal*, 31(1), 75–87.
- Argote, L. (1999). *Organizational learning: Creating, retaining, and transferring knowledge*. Boston, MA: Kluwer Academic Publishers.

- Argote, L., & Greve, H.R. (2007). A behavioral theory of the firm—40 years and counting: Introduction and impact. *Organization Science*, 18(3), 337–349.
- Audia, P.G., & Greve, H.R. (2006). Less likely to fail: Low performance, firm size, and factory expansion in the shipbuilding industry. *Management Science*, 52(1), 83–94.
- Axelrod, R., & Cohen, M. (1999). *Harnessing complexity*. New York: Free Press.
- Bandura, A., & Jourden, F.J. (1991). Self-regulatory mechanisms governing the impact of social comparison on complex decision making. *Journal of Personality and Social Psychology*, 60(6), 941–951.
- Barley, S.R. (1986). Technology as an occasion for restructuring: Evidence from observations of CT scanners and social order of radiology departments. *Administrative Science Quarterly*, 31(March), 24–60.
- Barnett, W.P., & Hansen, M. (1996). The red queen in organizational evolution. *Strategic Management Journal*, 17, 139–157.
- Barron, J., Chulkov, D., & Waddell, G. (2011). Top management team turnover, CEO succession type, and strategic change. *Journal of Business Research*, 64(8): 904–910.
- Baum, J.A.C., & Berta, W.B. (1999). Sources, dynamics, and speed: A longitudinal behavioral simulation of interorganizational and population-level learning. In Anne S. Miner & Philip Anderson (Eds.), *Advances in strategic management* (Vol. 16, pp. 155–184). Stamford, CT: JAI Press.
- Baum, J.A.C., Calabrese, T., & Silverman, B.S. (2000). Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology. *Strategic Management Journal*, 21(3), 267–294.
- Baum, J.A.C., & Dahlin, K.B. (2007). Aspiration performance and railroads' patterns of learning from train wrecks and crashes. *Organization Science*, 18(3), 368–385.
- Baum, J.A.C., & Ingram, P. (2002). Interorganizational learning and network organization: Toward a behavioral theory of the interfirm. In M. Augier & J. G. March (Eds.), *The economics of choice, change and organization: Essays in memory of Richard M. Cyert* (pp. 191–218). Cheltenham, UK: Elsevier.
- Baum, J.A.C., & Ingram, P. (2002). Interorganizational learning and network organization: Toward a behavioral theory of the interfirm. In M. Augier & J. G. March (Eds.), *The economics of choice, change and organization: Essays in memory of Richard M. Cyert* (pp. 191–218). Cheltenham, UK: Elsevier.
- Baum, J.A.C., & Ingram, P. (2002). Interorganizational learning and network organization: Toward a behavioral theory of the interfirm. In M. Augier & J. G. March (Eds.), *The economics of choice, change and organization: Essays in memory of Richard M. Cyert* (pp. 191–218). Cheltenham, UK: Elsevier.
- Baum, J.A.C., Rowley, T.J., Shipilov, A.V., & Chuang, Y.T. (2005). Dancing with strangers: Aspiration performance and the search for underwriting syndicate partners. *Administrative Science Quarterly*, 50(4), 536–575.
- Baum, J.R., & Wally, S. (2003). Strategic decision-making speed and firm performance. *Strategic Management Journal*, 24(11), 1107–1129.
- Becker, M.C. (Ed.). (2008). *Handbook of organizational routines*. Northampton, MA: Edward Elgar.
- Beckman, C.M. (2006). The influence of founding team company affiliations on firm behavior. *Academy of Management Journal*, 49(4), 741–758.

- Beckman, C.M., & Haunschild, P.R. (2002). Network learning: The effects of partners' heterogeneity of experience on corporate acquisitions. *Administrative Science Quarterly*, 47(1), 92–124.
- Berry, D.A., & Fristedt, B. (1985). *Bandit problems: Sequential allocation of experiments*. London: Chapman and Hall.
- Bouquet, C., & Birkinshaw, J. (2008). Weight versus voice: How foreign subsidiaries gain attention from corporate headquarters. *Academy of Management Journal*, 51(3), 577–601.
- Brass, D.J. (1995). Creativity: It's all in your social network. In C.M. Ford & D.A. Gioia (Eds.), *Creative action in organizations* (pp. 94–99). Thousand Oaks, CA: Sage.
- Briscoe, F., & Safford, S. (2008). The Nixon-in-China effect: Activism, imitation, and the institutionalization of contentious practices. *Administrative Science Quarterly*, 53(3), 460–491.
- Carroll, G., & Harrison, R. (1994). On the historical efficiency of competition between organizational populations. *American Journal of Sociology*, 100(3), 720–749.
- Chen, W.R. (2008). Determinants of firms' backward- and forward-looking R&D search behavior. *Organization Science*, 19(4), 609–622.
- Chen, W.R., & Miller, K.D. (2007). Situational and institutional determinants of firms' R&D search intensity. *Strategic Management Journal*, 28(4), 369–381.
- Cho, T.S., & Hambrick, D.C. (2006). Attention as the mediator between top management team characteristics and strategic change: The case of airline deregulation. *Organization Science*, 17(4), 453–469.
- Christensen, C. (1997). *The innovator's dilemma*. New York: HarperCollins.
- Christensen, M., & Knudsen, T. (2010). Design of decision-making organizations. *Management Science*, 56, 71–90.
- Chung, C.N., & Luo, X. (2008). Institutional logics or agency costs: The influence of corporate governance models on business group restructuring in emerging economies. *Organization Science*, 19(5), 766–784.
- Cohen, M.D., & Bacdayan, P. (1994). Organizational routines are stored as procedural memory: Evidence from a laboratory study. *Organization Science*, 5(4), 554–568.
- Cohen, M.D., March, J.G., & Olsen, J.P. (1972). A garbage can model of organizational choice. *Administrative Science Quarterly*, 17, 1–25.
- Combs, J.G., Ketchen, D.J., Perryman, A.A., & Donahue, M.S. (2007). The moderating effect of CEO power on the board composition-firm performance relationship. *Journal of Management Studies*, 44(8), 1299–1323.
- Cyert, R.M., & March, J.G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall.
- Cyert, R.M., & March, J.G. (1992). *A behavioral theory of the firm* (2nd ed.). Cambridge, MA: Blackwell.
- D'Aunno, T., Sutton, R.I., & Price, R.H. (1991). Isomorphism and external support in conflicting institutional environments: A study of drug abuse treatment units. *Academy of Management Journal*, 34(3), 636–661.
- Dalton, M. (1959). *Men who manage: Fusions of feeling and theory in administration*. New York, NY: Wiley.
- Darr, E.D., Argote, L., & Epple, D. (1995). The acquisition, transfer, and depreciation of knowledge in service organizations: Productivity in franchises. *Management Science*, 41(11), 1750–1762.
- Davis, G.F. (2009). The rise and fall of finance and the end of the society of organizations. *Academy of Management Perspectives*, 23(3), 27–44.

- Denrell, J., & March, J. (2001). Adaptation as information restriction: The hot stove effect. *Organization Science*, 12(5), 523–538.
- Desai, V.M. (2008). Constrained growth: How experience, legitimacy, and age influence risk taking in organizations. *Organization Science*, 19(4), 594–608.
- Desai, V. (2010a). Do organizations have to change to learn? Examining the effects of technological change and learning from failures in the natural gas distribution industry. *Industrial and Corporate Change*, 19(3), 713–739.
- Desai, V. (2010b). Ignorance isn't bliss: Complaint experience and organizational learning in the California nursing home industry, 1997–2004. *British Journal of Management*, 21(4), 829–842.
- Dosi, G., Nelson, R.R., & Winter, S.G. (2000). *The nature and dynamics of organizational capabilities*. Oxford: Oxford University Press.
- Dunn, M.B., & Jones, C. (2010). Institutional logics and institutional pluralism: The contestation of care and science logics in medical education, 1967–2005. *Administrative Science Quarterly*, 55(1), 114–149.
- Edmondson, A.C., Winslow, A.B., & Bohmer, R.M. (2003). Learning how and learning what: Effects of tacit and codified knowledge on performance improvement following technology adoption. *Decision Science*, 34(2), 197–223.
- Eggers, J.P., & Kaplan, S. (2009). Cognition and renewal: Comparing CEO and organizational effects on incumbent adaptation to technical change. *Organization Science*, 20(2), 461–477.
- Eisenhardt, K.M., & Bourgeois, L.J. (1988). Politics of strategic decision making in high-velocity environments: Towards a midrange theory. *Academy of Management Journal*, 31(4), 737–770.
- Eisenhardt, K.M., & Martin, J.A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10), 1105–1121.
- Emerson, R. (1962). Power-dependence relations. *American Sociological Review*, 27(1), 31–41.
- Ethiraj, S.K., & Levinthal, D. (2004). Modularity and innovation in complex systems. *Management Science*, 50, 159–173.
- Ethiraj, S.K., & Levinthal, D. (2009). Hoping for A to Z while rewarding only A: Complex organizations and multiple goals. *Organization Science*, 20, 4–24.
- Feldman, M.S. (2000). Organizational routines as a source of continuous change. *Organization Science*, 11(6), 611–629.
- Feldman, M.S., & Pentland, B.T. (2003). Reconceptualizing organizational routines as a source of flexibility and change. *Administrative Science Quarterly*, 48(1), 94–118.
- Felin, T., & Foss, N.J. (2005). Strategic organization: A field in search of micro-foundations. *Strategic Organization*, 3(4), 441–455.
- Fiss, P.C., & Zajac, E. (2004). The diffusion of ideas over contested Terrain: The (non)-adoption of a shareholder value orientation in German firms. *Administrative Science Quarterly*, 49(4), 501–534.
- Foss, N.J., & Knudsen, T. (2003). The resource-based tangle: Towards a sustainable explanation of competitive advantage. *Managerial & Decision Economics*, 24(4), 291–307.
- Gavetti, G. (2005). Cognition and hierarchy: Rethinking the microfoundations of capabilities' development. *Organization Science*, 16, 599–619.
- Gavetti, G. (2011). The new psychology of strategic leadership. *Harvard Business Review*, July–August.



- Gavetti, G. (2012). Toward a behavioral theory of strategy. *Organization Science*, 23(1), 267–285.
- Gavetti, G., & Levinthal, D. (2000). Looking forward and looking backward: Cognitive and experiential search. *Administrative Science Quarterly*, 45, 113–137.
- Gavetti, G., & Levinthal, D. (2004). The strategy field from the perspective of management science: Divergent strands and possible integration. *Management Science*, 50(10), 1309–1318.
- Gavetti, G., Levinthal, D., & Ocasio, W. (2007). Neo-Carnegie: The Carnegie school's past, present, and reconstructing for the future. *Organization Science*, 18(3), 523–536.
- Gavetti, G., Levinthal, D., & Rivkin, J. (2005). Strategy making in novel and complex worlds: The power of analogy. *Strategic Management Journal*, 26, 691–712.
- Giachetti, C., & Lampel, J. (2010). Keeping both eyes on the competition: Strategic adjustment to multiple targets in the UK mobile phone industry. *Strategic Organization*, 8(4), 347–376.
- Gibbons, R. (2003). Team theory, garbage cans, and real organizations: Some history and prospects of economic research on decision-making in organizations. *Industrial and Corporate Change*, 12(4), 753–787.
- Gittins, J.C. (1979). Bandit processes and dynamic allocation indices. *Journal of the Royal Statistical Society. Series B (Methodological)*, 41(2), 148–177.
- Greenwood, R., Raynard, M., Kodeih, F., Micelotta, E.R., & Lounsbury, M. (2011). Institutional complexity and organizational responses. *Academy of Management Annals*, 5, 317–371.
- Greve, H.R. (1998). Performance, aspirations, and risky organizational change. *Administrative Science Quarterly*, 44, 58–86.
- Greve, H.R. (2003a). *Organizational learning from performance feedback: A behavioral perspective on innovation and change*. Cambridge: Cambridge University Press.
- Greve, H.R. (2003b). A behavioral theory of R&D expenditures and innovation: Evidence from shipbuilding. *Academy of Management Journal*, 46(6), 685–702.
- Greve, H.R. (2007). Exploration and exploitation in product innovation. *Industrial and Corporate Change*, 16(5), 945–975.
- Greve, H.R. (2008). A behavioral theory of firm growth: Sequential attention to size and performance goals. *Academy of Management Journal*, 51(3), 476–494.
- Greve, H.R. (2011). Positional rigidity: Low performance and resource acquisition in large and small firms. *Strategic Management Journal*, 32(1), 103–114.
- Greve, H.R., Palmer, D., & Pozner, J.E. (2010). Organizations gone wild: The causes, processes, and consequences of organizational misconduct. *Academy of Management Annals*, 4, 53–107.
- Guillen, M.F. (1994). *Models of management: Work, authority, and organization in a comparative perspective*. Chicago, IL: University of Chicago Press.
- Gulati, R., & Gargiulo, M. (1999). Where do interorganizational networks come from? *American Journal of Sociology*, 104(5), 1439–1493.
- Gupta, A., Smith, K., & Shalley, C. (2006). The interplay between exploration and exploitation. *Academy of Management Journal*, 49(4), 693–706.
- Haleblian, J.J., Kim, J.Y.J., & Rajagopalan, N. (2006). The influence of acquisition experience and performance on acquisition behavior: Evidence from the US commercial banking industry. *Academy of Management Journal*, 49(2), 357–370.

- Hambrick, D.C., & Mason, P.A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193–206.
- Hansen, M.T. (2002). Knowledge networks: Explaining effective knowledge sharing in multiunit companies. *Organization Science*, 13(3), 232–248.
- Hansen, M.T., & Haas, M.R. (2001). Competing for attention in knowledge markets: Electronic document dissemination in a management consulting company. *Administrative Science Quarterly*, 46(1), 1–28.
- Harris, J.D., & Bromiley, P. (2007). Incentives to cheat: The influence of executive compensation and firm performance on financial misrepresentation. *Organization Science*, 18(3), 350–367.
- Haunschild, P.R., & Sullivan, B.N. (2002). Learning from complexity: Effects of prior accidents and incidents on airlines' learning. *Administrative Science Quarterly*, 47(December), 609–643.
- Helfat, C.E., & Peteraf, M.A. (2009). Understanding dynamic capabilities: Progress along a developmental path. *Strategic Organization*, 7, 91–102.
- Hoffman, A.J. (1999). Institutional evolution and change: Environmentalism and the U.S. chemical industry. *Academy of Management Journal*, 42(4), 351–371.
- Hoffman, A.J., & Ocasio, W. (2001). Not all events are attended equally: Toward a middle-range theory of industry attention to external events. *Organization Science*, 12(4), 414–434.
- Holland, J. (1975). *Adaptation in natural and artificial systems: An introductory analysis with applications to biology, control & artificial intelligence*. Ann Arbor: University of Michigan Press.
- Holyoak, K.J., & Thagard, P. (1996). *Mental leaps. Analogy in creative thought*. Cambridge: MIT Press.
- Ingram, P. (2002). Interorganizational learning. In J.A.C. Baum (Ed.), *The Blackwell companion to organizations* (pp. 642–663). Oxford, UK: Blackwell.
- Ingram, P., & Baum, J.A.C. (1997). Opportunity and constraint: Organizations' learning from the operating and competitive experience of industries. *Strategic Management Journal*, 18(Summer), 75–98.
- Iyer, D.N., & Miller, K.D. (2008). Performance feedback, slack, and the timing of acquisitions. *Academy of Management Journal*, 51(4), 808–822.
- Jacobides, M.G. (2007). The inherent limits of organizational structure and the unfulfilled role of hierarchy: Lessons from a near-war. *Organization Science*, 18(3), 455–477.
- Jara-Bertin, M., López-Iturriaga, F.J., & López-De-Foronda, Ó. (2008). The contest to the control in European family firms: How other shareholders affect firm value. *Corporate Governance: An International Review*, 16(3), 146–159.
- Jung, J.C., & Bansal, P. (2009). How firm performance affects internationalization. *Management International Review*, 49(6), 709–732.
- Kaplan, S. (2008). Cognition, capabilities and incentives: Assessing firm response to the fiber-optic revolution. *Academy of Management Journal*, 51(4), 672–694.
- Kauffman, S.A. (1993). *The origins of order*. Oxford: Oxford University Press.
- Ketokivi, M., & Castañer, X. (2004). Strategic planning as an integrative device. *Administrative Science Quarterly*, 49(3), 337–365.
- Khanna, T., & Rivkin, J.W. (2001). Estimating the performance effect of business groups in emerging markets. *Strategic Management Journal*, 22(1), 45–74.
- Knott, A.M. (2001). The dynamic value of hierarchy. *Management Science*, 47(3), 430–448.

- Knott, A.M. (2003). The organizational routines factor market paradox. *Strategic Management Journal*, 24, 929–943.
- Knudsen, T., & Levinthal, D. (2007). Two faces of search: Alternative generation and alternative evaluation. *Organizational Science*, 18, 39–54.
- Lant, T.K. (1992). Aspiration level adaptation: An empirical exploration. *Management Science*, 38(5), 623–644.
- Lant, T.K., & Mezias, S. (1992). An organizational learning model of convergence and reorientation. *Organization Science*, 3(1), 47–71.
- Lave, C.A., & March, J.G. (1976). *An introduction to models in the social sciences*. New York: Harper & Row.
- Lavie, D., & Rosenkopf, L. (2006). Balancing exploration and exploitation in alliance formation. *Academy of Management Journal*, 49(4), 797–818.
- Le Mens, G., & Denrell, J. (2011). Rational learning and information sampling: On the naivety assumption in sampling explanations of judgment biases. *Psychological Review*, 118(2), 379–392.
- Levinthal, D. (1997). Adaptation on rugged landscapes. *Management Science*, 43, 934–950.
- Levinthal, D., & March, J.G. (1981). A model of adaptive organizational search. *Journal of Economic Behavior and Organizations*, 2, 307–333.
- Levinthal, D., & March, J.G. (1993). The myopia of learning. *Strategic Management Journal*, 14, 95–112.
- Levinthal, D., & Rerup, C. (2006). Crossing an apparent chasm: Bridging mindful and less-mindful perspectives on organizational learning. *Organization Science*, 17(4), 502–513.
- Levitt, B., & March, J.G. (1988). Organizational learning. In W.R. Scott & J. Blake (Eds.), *Annual Review of Sociology* (Vol. 14, pp. 319–340). Palo Alto, CA: Annual Reviews.
- Levy, O. (2005). The influence of top management team attention patterns on global strategic posture of firms. *Journal of Organizational Behavior*, 26(7), 797–819.
- Lincoln, J.R., Gerlach, M.L., & Ahmadjian, C.L. (1996). Keiretsu networks and corporate performance in Japan. *American Sociological Review*, 61(February), 67–88.
- Lounsbury, M. (2007). A tale of two cities: Competing logics and practice variation in the professionalizing of mutual funds. *Academy of Management Journal*, 50(2), 289–307.
- Lovaglio, D., Clarke, C., & Camerer, C. (Forthcoming). Robust analogizing and the outside view: Two empirical tests of case-based decision making. *Strategic Management Journal*.
- Luo, X., & Chung, C-N. (2005). Keeping it all in the family: The role of particularistic relationships in business group performance during institutional transition. *Administrative Science Quarterly*, 50(3), 404–439.
- Madsen, P.M., & Desai, V.M. (2010). Failing to learn? The effects of failure and success on organizational learning in the global orbital launch vehicle industry. *Academy of Management Journal*, 53(3), 451–476.
- Marcel, J.J., Barr, P.S., & Duhaime, I.M. (2011). The influence of executive cognition on competitive dynamics. *Strategic Management Journal*, 32(2), 115–138.
- March, J.G. (1962). The business firm as a political coalition. *Journal of Politics*, 24, 662–678.
- March, J.G. (1978). Bounded rationality, ambiguity, and the engineering of choice. *Bell Journal of Economics*, 9, 587–608.

- March, J.G. (1981). Footnotes to organizational change. *Administrative Science Quarterly*, 26, 563–567.
- March, J.G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2, 71–87.
- March, J.G. (1996). Learning to be risk averse. *Psychological Review*, 103(2), 309–319.
- March, J.G. (2003). Understanding organizational adaptation. *Society and Economy*, 25(1), 1–10.
- March, J.G. (2005). Parochialism in the evolution of a research community. *Management and Organization Review*, 1(1), 5–22.
- March, J.G. (2010). *The ambiguities of experience*. Ithaca, NY: Cornell University Press.
- March, J.G., & Olsen, J.P. (1976). *Ambiguity and choice in organizations*. Bergen: Scandinavian University Press.
- March, J.G., Schulz, M., & Zhou, X. (2000). *The dynamics of rules: Change in written organizational codes*. Stanford, CA: Stanford University Press.
- March, J.G., & Simon, H.A. (1958). *Organizations*. New York: Wiley.
- March, J.L., Sproull, S., & Tamuz, M. (1991). Learning from samples of one or fewer. *Organization Science*, 2, 1–13.
- Marengo, L., Dosi, G., Legrenzi, P., & Pasquali, C. (2000). The structure of problem-solving knowledge and the structure of organizations. *Industrial and Corporate Change*, 9, 757–788.
- Massini, S., Lewin, A.Y., & Greve, H.R. (2005). Innovators and imitators: Organizational reference groups and adoption of organizational routines. *Research Policy*, 34(10), 1550–1569.
- McDonald, M.L., & Westphal, J.D. (2003). Getting by with the advice of their friends: CEOs' advice networks and firms' strategic responses to poor performance. *Administrative Science Quarterly*, 48(1), 1–32.
- Meeus, M.T.H., Oerlemans, L.A.G., & Hage, J. (2001). Patterns of interactive learning in a high-tech region. *Organization Studies*, 21(2), 145–172.
- Meyer, J.W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83, 340–363.
- Mezias, S., & Glynn, M.A. (1993). The three faces of corporate renewal: Institution, revolution, and evolution. *Strategic Management Journal*, 14(2), 77–101.
- Miller, J., & Page, S. (2007). *Complex adaptive systems: An introduction to computational models of social life*. Princeton, NJ: Princeton University Press.
- Miner, A.S., & Anderson, P. (1999). Industry and population-level learning: Organizational, interorganizational, and collective learning processes. In A.S. Miner & P. Anderson (Eds.), *Advances in strategic management* (Vol. 16, pp. 1–30). Greenwich, CT: JAI Press.
- Miner, A.S., Kim, J-Y., Holzinger, I.W., & Haunschild, P.R. (1999). Fruits of failure: Organizational failure and population-level learning. In A. Miner & P. Anderson (Eds.), *Advances in strategic management* (pp. 187–220). Greenwich, CT: JAI Press.
- Miner, A.S., & Mezias, S.J. (1996). Ugly duckling no more: Past and futures of organizational learning research. *Organization Science*, 7(1), 88–99.
- Mishina, Y., Dykes, B.J., Block, E.S., & Pollock, T.G. (2010). Why "good" firms do bad things: The effects of high aspirations, high expectations, and prominence on the

- incidence of corporate illegality. *Academy of Management Journal*, 53(4), 701–722.
- Mohr, L.B. (1971). Organizational technology and organizational structure. *Administrative Science Quarterly*, 16, 444–459.
- Mors, M.L. (2010). Innovation in a global consulting firm: When the problem is too much diversity. *Strategic Management Journal*, 31(8), 841–872.
- Nadkarni, S., & Barr, P.S. (2008). Environmental context, managerial cognition, and strategic action: An integrated view. *Strategic Management Journal*, 29(13), 1395–1427.
- Nelson, R.R., & Winter, S.G. (1982). *An evolutionary theory of economic change*. Cambridge, MA: Harvard University Press.
- Nelson, R.R., & Winter, S.G. (2002). Evolutionary theorizing in economics. *Journal of Economic Perspectives*, 16(2), 23–46.
- Nigam, A., & Ocasio, W. (2010). Event attention, environmental sensemaking, and change in institutional logics: An inductive analysis of the effects of public attention to Clinton's health care reform initiative. *Organization Science*, 21(4), 823–841.
- Ocasio, W. (1994). Political dynamics and the circulation of power: CEO succession in U.S. industrial corporations, 1960–1990. *Administrative Science Quarterly*, 39(2), 285–312.
- Ocasio, W. (1997). Towards an attention-based view of the firm. *Strategic Management Journal*, 18, 187–206.
- Ocasio, W. (1999). Institutionalized action and corporate governance: The reliance on rules of CEO succession. *Administrative Science Quarterly*, 44(2), 384–416.
- Ocasio, W. (2011). Attention to attention. *Organization Science*, 22(5), 1286–1296.
- Ocasio, W., & Joseph, J. (2005). An attention-based theory of strategy formulation: Linking micro- and macroperspectives in strategy processes. In G. Szulanski, J. Porac, & Y. Doz (Eds.), *Strategy process (Advances in strategic management)* (Vol. 22, pp. 39–61). Bingley, UK: Emerald Group Publishing Limited.
- Ocasio, W., & Joseph, J. (2008). Rise and fall, or transformation? The evolution of strategic planning at General Electric. *Long Range Planning*, 41(3), 248–272.
- Ocasio, W., & Kim, H. (1999). The circulation of corporate control: Selection of functional backgrounds of new CEOs in large U.S. manufacturing firms, 1981–1992. *Administrative Science Quarterly*, 44(3), 532–562.
- Pache, A.C., & Santos, F. (2010). When worlds collide: The internal dynamics of organizational responses to conflicting institutional demands. *Academy of Management Review*, 35(3), 455–476.
- Papadakis, V.M., Lioukas, S., & Chambers, D. (1998). Strategic decision-making processes: The role of management and context. *Strategic Management Journal*, 19(2), 115–147.
- Park, K.M. (2007). Antecedents of convergence and divergence in strategic positioning: The effects of performance and aspiration on the direction of strategic change. *Organization Science*, 18(3), 386–402.
- Parmigiani, A., & Howard-Grenville, J. (2011). Routines revisited: Exploring the capabilities and practice perspectives. *Academy of Management Annals*, 5, 413–453.
- Pentland, B.T., & Rueter, H.H. (1994). Organizational routines as grammars of action. *Administrative Science Quarterly*, 39(3), 484–510.

- Perrow, C. (1967). A framework for the comparative analysis of organizations. *American Sociological Review*, 32(2), 194–208.
- Pfeffer, J. (1981). *Power in organizations*. Marshfield, MA: Pitman.
- Pfeffer, J., & Salancik, G.R. (1978). *The external control of organizations: A resource dependence perspective*. New York, NY: Harper and Row.
- Posen, H., & Levinthal, D. (forthcoming). Chasing a moving target: Exploration and exploitation in dynamic environments. *Management Science*.
- Reagans, R., & Zuckerman, E.W. (2001). Networks, diversity, and productivity: The social capital of corporate R&D teams. *Organization Science*, 12(4), 502–517.
- Repenning, N.P. (2002). A simulation-based approach to understanding the dynamics of innovation implementation. *Organization Science*, 13(2), 109–127.
- Rerup, C. (2009). Attentional triangulation: Learning from unexpected rare crises. *Organization Science*, 20(5), 876–893.
- Rhee, M. (2009). Does reputation contribute to reducing organizational errors? A learning approach. *Journal of Management Studies*, 46(4), 676–703.
- Rivkin, J. (2000). Imitation of complex strategies. *Management Science*, 46, 824–844.
- Rivkin, J., & Siggelkow, N. (2003). Balancing search and stability: Interdependencies among elements of organizational design. *Management Science*, 49, 290–321.
- Robbins, H. (1952). Some aspects of the sequential design of experiments. *Bulletin of the American Mathematical Society*, 58, 527–535.
- Rosenkopf, L., Metiu, A., & George, V.P. (2001). From the bottom up? Technical committee activity and alliance formation. *Administrative Science Quarterly*, 46(4), 748–772.
- Rosenkopf, L., & Nerkar, A. (2001). Beyond local search: Boundary-spanning, exploration, and impact in the optical disc industry. *Strategic Management Journal*, 22(4), 287–306.
- Sah, R., & Stiglitz, J. (1986). The architecture of economic systems: Hierarchies and polyarchies. *American Economic Review*, 76, 716–727.
- Salge, T.O. (2011). A behavioral model of innovative search: Evidence from public hospital services. *Journal of Public Administration Research & Theory*, 21(1), 181–210.
- Schulz, M. (2001). The uncertain relevance of newness: Organizational learning and knowledge flows. *Academy of Management Journal*, 44(4), 661–681.
- Schulz, M. (2002). Organizational learning. In J.A.C. Baum (Ed.), *Companion to organizations* (pp. 415–441). Oxford, UK: Blackwell.
- Schwab, A. (2007). Incremental organizational learning from multilevel information sources: Evidence for cross-level interactions. *Organization Science*, 18(2), 233–251.
- Schwab, A., & Miner, A.S. (2008). Learning in hybrid-project systems: The effects of project performance on repeated collaboration. *Academy of Management Journal*, 51(6), 1117–1149.
- Shen, W., & Cannella, A.A. (2002). Power dynamics within top management and their impacts on CEO dismissal followed by inside succession. *Academy of Management Journal*, 45(6), 1195–1206.
- Shimizu, K. (2007). Prospect theory, behavioral theory, and the threat-rigidity thesis: Combinative effects on organizational decisions to divest formerly acquired units. *Academy of Management Journal*, 50(6), 1495–1514.

- Shipilov, A.V., Greve, H.R., & Rowley, T.J. (2010). When do interlocks matter? Institutional logics and the diffusion of multiple corporate governance practices. *Academy of Management Journal*, 53(4), 846–864.
- Shipilov, A., Li, S.X., & Greve, H.R. (2011). The prince and the pauper: Search and brokerage in the initiation of status-heterophilous ties. *Organization Science*, 22(6), 1418–1434.
- Simon, H.A. (1947). *Administrative behavior: A study of decision-making processes in administrative organizations*. New York, NY: Macmillan.
- Simon, H. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics*, 69, 99–118.
- Simon, H. (1962). The architecture of complexity. *Proceedings of the American Philosophical Society*, 106, 467–482.
- Simons, T., & Roberts, P.W. (2008). Local and non-local pre-founding experience and new organizational form penetration: The case of the Israeli wine industry. *Administrative Science Quarterly*, 53(2), 235–265.
- Stinchcombe, A.L. (1965). Social structure and organizations. In J.G. March (Ed.), *Handbook of organizations* (pp. 153–193). Chicago, IL: Rand McNally.
- Stuart, T.E., & Podolny, J.M. (1996). Local search and the evolution of technological capabilities. *Strategic Management Journal*, 17(Summer special issue), 21–38.
- Sutton, R.S., & Barto, A.G. (1998). *Reinforcement learning: An introduction*. Cambridge, MA: MIT Press.
- Szulanski, G., & Jensen, R.J. (2006). Presumptive adaptation and the effectiveness of knowledge transfer. *Strategic Management Journal*, 27(10), 937–957.
- Taylor, A., & Greve, H.R. (2006). Superman or the fantastic four? Knowledge combination and experience in innovative teams. *Academy of Management Journal*, 49(4), 723–740.
- Teece, D.J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350.
- Thornton, P.H. (2004). *Markets from culture: Institutional logics and organizational decisions in higher education publishing*. Stanford, CA: Stanford University Press.
- Thornton, P.H., & Ocasio, W. (1999). Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958–1990. *American Journal of Sociology*, 105(3), 801–843.
- Tuggle, C.S., Sirmon, D.G., Reutzel, C.R., & Bierman, L. (2010). Commanding board of director attention: Investigating how organizational performance and CEO duality affect board members' attention to monitoring. *Strategic Management Journal*, 31(9), 946–968.
- Van Ees, H., Gabrielsson, J., & Huse, M. (2009). Toward a behavioral theory of boards and corporate governance. *Corporate Governance: An International Review*, 17(3), 307–319.
- Vaughn, D. (1996). *The challenger launch decision: Risky technology, culture, and deviance at NASA*. Chicago, IL: University of Chicago Press.
- Vissa, B., Greve, H.R., & Chen, W. (2010). Business group affiliation and firm search behavior in India: Responsiveness and focus of attention. *Organization Science*, 21(3), 696–712.

- Weber, K., Davis, G.F., & Lounsbury, M. (2009). Policy as myth and ceremony? The global spread of stock exchanges, 1980–2005. *Academy of Management Journal*, 52(6), 1319–1347.
- Weber, K., Rao, H., & Thomas, L.G. (2009). From streets to suites: How the anti-biotech movement affected German pharmaceutical firms. *American Sociological Review*, 74(1), 106–127.
- Zander, U., & Kogut, B. (1995). Knowledge and the speed of transfer and imitation of organizational capabilities: An empirical test. *Organization Science*, 6(January), 76–92.
- Zbaracki, M.J., & Bergen, M. (2010). When truces collapse: A longitudinal study of price-adjustment routines. *Organization Science*, 21(5), 955–972.
- Zhang, Y. (2006). The presence of a separate COO/president and its impact on strategic change and CEO dismissal. *Strategic Management Journal*, 27, 283–300.
- Zollo, M., & Winter, S.G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3), 339–351.