

Organizational Ambidexterity: Antecedents, Outcomes, and Moderators[†]

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Organizational ambidexterity, defined as an organization's ability to be aligned and efficient in its management of today's business demands while simultaneously being adaptive to changes in the environment, has gained increasing interest in recent years. In this article, the authors review various literature streams to develop a comprehensive model that covers research into the antecedents, moderators, and outcomes of organizational ambidexterity. They indicate gaps within and across different research domains and point to important avenues for future research.

Keywords: *ambidexterity; change; exploitation; exploration; innovation; learning*

A persistent theme in a variety of organizational literatures is that successful firms are ambidextrous—aligned and efficient in their management of today's business demands while simultaneously adaptive to changes in the environment (Duncan, 1976; Gibson & Birkinshaw, 2004; Tushman & O'Reilly, 1996). To be ambidextrous, organizations have to reconcile internal tensions and conflicting demands in their task environments. Whereas earlier studies often regarded these trade-offs as insurmountable, more recent research has presented a range of organizational solutions to support ambidexterity. Scholars first put forward different structural mechanisms to cope with the competing demands facing the organization (Adler, Goldoftas, &

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Levine, 1999; McDonough & Leifer, 1983; Tushman & O'Reilly, 1996). Conversely, Gibson and Birkinshaw (2004) proposed that ambidexterity arises from a business unit's organizational context. Recently, scholars have started to investigate leadership characteristics that enable organizations to manage and embrace the contradictions that they face (Beckman, 2006; Lubatkin, Simsek, Ling, & Veiga, 2006; Smith & Tushman, 2005).

Two factors motivated this synthesis of the research streams on organizational ambidexterity. First, with contributions coming from an increasing variety of research domains, the initially focused debate on organizational ambidexterity has become disconnected and complex. This has not only led to a lack of transparency in the vocabulary that is used but also, more critically, in respect of the different phenomena's specific effects. The field would therefore benefit from a comprehensive framework that integrates the various insights from prior research while specifying the dominant relationships between the most relevant variables. Second, organizational ambidexterity is still in the process of developing into a new research paradigm in organizational theory. Consequently, the research on organizational ambidexterity is strong in some areas while weak or virtually nonexistent in others. We identify gaps within and across different research streams and point to important avenues for future research.

Different literature streams, including organizational learning, technological innovation, organizational adaptation, strategic management, and organizational design, have contributed to the research on organizational ambidexterity. Studies using labels such as *reconciling exploitation and exploration*, the *simultaneity of induced and autonomous strategy processes*, *synchronizing incremental and discontinuous innovation*, and *balancing search and stability* tend to refer to the same underlying construct and are included in our analysis. These studies view organizational ambidexterity as a prerequisite of organizational survival and success. Consequently, the literature has focused on analyzing the relationship between organizational ambidexterity and firm performance (e.g., Gibson & Birkinshaw, 2004; He & Wong, 2004). Studies have also proposed a variety of antecedents, and recent research has begun to specify more complex relationships and potential moderating effects (e.g., Auh & Menguc, 2005; Jansen, van den Bosch, & Volberda, 2005a). We consequently develop a comprehensive framework that covers research on the antecedents, moderators, and outcomes of organizational ambidexterity. On the basis of our literature review, we derive suggestions for future research.

Evolution of Organizational Ambidexterity Research

Whereas Duncan (1976) was the first to use the term *organizational ambidexterity*, it is March's (1991) landmark article that has frequently been cited as the catalyst for the current interest in the concept. March proposes that *exploitation* and *exploration* are two fundamentally different learning activities between which firms divide their attention and resources. Whereas exploitation is associated with activities such as "refinement, efficiency, selection, and implementation," exploration refers to notions such as "search, variation, experimentation, and discovery" (p. 102). Exploitation and exploration may therefore require fundamentally different organizational structures, strategies, and contexts. Several scholars maintain that there is a trade-off between aligning the organization to exploit existing competencies and exploring new ones (Ancona, Goodman, Lawrence, & Tushman, 2001; Floyd & Lane, 2000; Levinthal & March, 1993).

Earlier research had often claimed that organizational practices that simultaneously address efficient exploitation and effective exploration may be impossible to achieve (e.g., Hannan & Freeman, 1977; McGill, Slocum, & Lei, 1992; Miller & Friesen, 1986). Much of contemporary management theory had thus presented organizational phenomena in terms of discrete, contrasting categories, forcing firms to focus on either exploitation or exploration (Burns & Stalker, 1961; Denison, Hooijberg, & Quinn, 1995; Ghemawat & Ricart i Costa, 1993). In his 1991 article, March conversely argues that organizations need to be aligned to both exploitation and exploration. A one-sided focus on exploitation may enhance short-term performance, but it can result in a competency trap because firms may not be able to respond adequately to environmental changes (Ahuja & Lampert, 2001; Leonard-Barton, 1992). Conversely, too much exploration may enhance a firm's ability to renew its knowledge base but can trap organizations in an endless cycle of search and unrewarding change (Volberda & Lewin, 2003). Levinthal and March (1993) conclude that long-term survival and success depend on an organization's ability to "engage in enough exploitation to ensure the organization's current viability and to engage in enough exploration to ensure future viability" (p. 105).

March's (1991) argument that successful firms are ambidextrous contributed to a general shift in organizational research from trade-off to paradoxical thinking (Eisenhardt, 2000; Gavetti & Levinthal, 2000; Lewis, 2000). Researchers have increasingly come to recognize the importance of balancing seemingly contradictory tensions (Adler et al., 1999; J. S. Brown & Duguid, 2001; Katila & Ahuja, 2002). More specifically, various works, ranging from technological change to organization design, have discussed the need for firms to achieve a balance between exploitation and exploration activities (Benner & Tushman, 2003; Burgelman, 1991; Eisenhardt & Martin, 2000; Gupta, Smith, & Shalley, 2006; Tushman & O'Reilly, 1996; Volberda, 1996).

Literature Streams Related to Organizational Ambidexterity

Researchers working in various literature streams have contributed to the discussion on organizational ambidexterity. The contradictions between exploitation and exploration, as well as the need to reconcile the two orientations, have been discussed in contexts such as organizational learning, technological innovation, organizational adaptation, strategic management, and organizational design.

Organizational learning. Following March's (1991) article, discussion arose in the learning literature on whether exploitation and exploration should both be associated with learning activities. A group of researchers defined exploitation as the mere reuse of existing knowledge and thus assigned all instances of learning to exploration (Rosenkopf & Nerkar, 2001; Vassolo, Anand, & Folta, 2004; Vermeulen & Barkema, 2001). Other scholars have found that their ideas coincide to a greater degree with those of March, who initially differentiated between exploitation and exploration by focusing on the type or degree of learning rather than the presence or absence of learning (Benner & Tushman, 2003; Gupta et al., 2006; He & Wong, 2004). Baum, Li, and Usher (2000), for example, suggest that "exploitation refers to learning gained via local search, experiential refinement, and selection and

reuse of existing routines. Exploration refers to learning gained through processes of concerted variation, planned experimentation, and play" (p. 768).

These categories reflect other classifications into different modes of organizational learning, such as double-loop versus single-loop learning (Argyris & Schön, 1978), generative versus adaptive learning (Senge, 1990), local search versus long jump (Levinthal, 1997), and product innovation versus production-oriented learning (McKee, 1992). Despite the differences between the two learning processes, scholars have long believed that a well-balanced combination of the two types of learning is essential for long-term organizational success (Gupta et al., 2006; Levinthal & March, 1993; March, 1991). Whereas March considers the two types of learning as fundamentally incompatible, subsequent studies often conceptualize exploitation and exploration as orthogonal variables that can be achieved simultaneously (Auh & Menguc, 2005; Baum et al., 2000; Katila & Ahuja, 2002). Mom, van den Bosch, and Volberda (2007), for instance, show that managers may engage in high levels of exploitation as well as exploration activities. Top-down knowledge inflows from persons at higher hierarchical levels than the manager are positively related to exploitation. Conversely, horizontal and bottom-up knowledge inflows from peers and persons at lower hierarchical levels are positively related to exploration. The findings thus indicate that the more a manager acquires top-down and horizontal or bottom-up knowledge flows, the higher the levels of exploration and exploitation in which the manager engages.

Technological innovation. One of the central research themes in the literature on technological innovation is the distinction between incremental and radical innovation (Abernathy & Clark, 1985; Dewar & Dutton, 1986; Tushman & Anderson, 1986). Incremental innovation represents relatively minor adaptations of existing products and business concepts. In contrast, radical innovation refers to fundamental changes leading to a switch from existing products or concepts to completely new ones. Extending this line of work, Tushman and Smith (2002) describe incremental innovations (which are designed to meet existing customers' needs) as exploitative and radical innovations (which are designed to meet the needs of emergent customers) as explorative. Subsequent studies have adopted and further developed the exploitative and exploratory innovation categories (Atuahene-Gima, 2005; Benner & Tushman, 2003; Danneels, 2002; Holmqvist, 2004; Smith & Tushman, 2005).

Several scholars point to the tensions that organizations encounter when pursuing both types of innovation simultaneously (Abernathy, 1978; Dougherty, 1992; Nadler & Tushman, 1997). Leonard-Barton (1992), for example, describes a capability-rigidity paradox in product innovation: Exploiting existing product innovation capabilities may have dysfunctional rigidity affects that crowd out exploration of new competencies. At the same time, scholars stress the importance of pursuing both innovation processes. In this context, Tushman and O'Reilly (1996) define ambidexterity as the "ability to simultaneously pursue both incremental and discontinuous innovation" (p. 24). Ancona et al. (2001) suggest that dynamic capabilities are rooted in exploitative and explorative innovations. Colbert (2004) argues that the interaction between exploration and exploitation reflects a complex capability that provides an additional source of corporate advantage beyond those provided by each innovation activity individually. Several authors outline the various organizational dimensions that can be instrumental in finding a balance between the two innovation types (Atuahene-Gima,

2005; S. L. Brown & Eisenhardt, 1997; Christensen & Overdorf, 2000; O'Reilly & Tushman, 2004; Sheremata, 2000).

Organizational adaptation. Many scholars have suggested that long-term success requires an organizational balance between continuity and change (e.g., S. L. Brown & Eisenhardt, 1997; Leana & Barry, 2000; Miller & Friesen, 1984; Probst & Raisch, 2005; Tushman & Romanelli, 1985; Volberda, 1996). Tushman and Romanelli (1985), for example, develop a model of organizational evolution that is defined by long periods of convergence punctuated by short periods of discontinuous change. Successful organizations thus not only emphasize exploitation and alignment during periods of evolutionary change but also pursue radical transformation and exploration in periods of revolutionary change (Tushman & O'Reilly, 1996). Along the same lines, Meyer and Stensaker (2006) relate an organization's capacity for change to its ability to balance the need to implement changes and the need to maintain daily operations. The need for balance between continuity and change is also reflected by related constructs, including organizational identity (Dutton & Dukerich, 1991; Gagliardi, 1986; Gioia, Schultz, & Corley, 2000), absorptive capacity (Jansen, van den Bosch, & Volberda, 2005b; Zahra & George, 2002), and in recent redefinitions of organizational routines (Feldman & Pentland, 2003).

These theories' common underlying belief is that too many (or too radical) change actions could create organizational chaos if continuity is not taken into account, whereas the opposite could lead to inertia (Huy, 2002; Levinthal & March, 1993; Sastry, 1997). Consequently, some researchers argue that there is a need for regular and rhythmical organizational change by means of time pacing (S. L. Brown & Eisenhardt, 1997). Others suggest that managers take center stage in "mediating between forces for convergence and forces for change" (Tushman & Romanelli, 1985). Top management is mostly considered the main driver of discontinuous change, whereas middle management is expected to support incremental change (Floyd & Woolridge, 1996; Shrivastava, 1986). Conversely, Huy (2002) has developed a theory that middle managers facilitate organizational adaptation through the emotional balancing of continuity and change.

Strategic management. Burgelman's (1991, 2002) internal ecology model of strategy making distinguishes between variation-reducing, induced strategic processes and variation-increasing, autonomous strategic processes. The induced processes concern initiatives that are within the scope of the organization's current strategy and build on existing knowledge, whereas the autonomous processes concern initiatives that emerge outside the current strategy's scope and involve the creation of new competencies. In his 2002 article, Burgelman explicitly relates induced strategic processes to exploitation and autonomous strategy processes to exploration. Both types of strategy processes compete for scarce resources: Company leaders therefore make trade-offs between them. Burgelman's (1991) analysis suggests that a combination of the two strategic processes may be the most beneficial: "organizations may have to keep both processes in play at all times, even though this means that the organization never completely maximizes its efforts in the current domain" (p. 256).

A number of subsequent studies have provided arguments similar to those of Burgelman, albeit using different terms and mostly without referring to one another. Ghemawat and

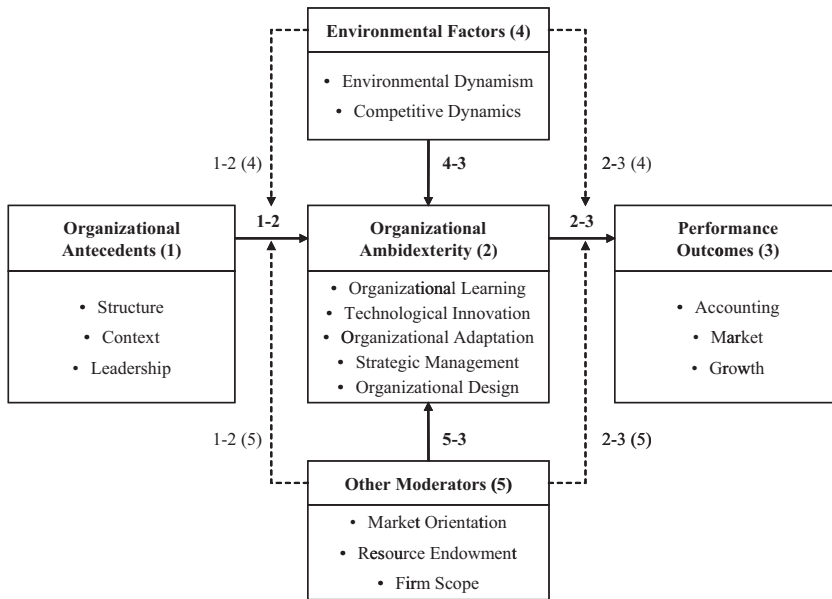
Ricart i Costa (1993) distinguish between static efficiency and dynamic efficiency, with the former concerned about the refinement of existing products, processes, and capabilities and the latter concerned about the development of new ones. They describe the organizational trade-off between these two strategic processes and demonstrate that organizations have a tendency to focus on only one. Hamel and Prahalad (1993) emphasize that the tension between leverage and stretch—the need to exploit existing capabilities and the search for new ones—is a key strategic challenge for creating competitive advantage. Accordingly, Sanchez, Heene, and Thomas (1996) argue that successful firms have the capability of maintaining a mix of competence-leveraging and competence-building activities. Competence leveraging refers to applying existing competences, whereas competence building refers to the development of new capabilities. Finally, Volberda, Baden-Fuller, and van den Bosch (2001) distinguish between selective and adaptive strategic actions and present four “renewal journeys” that combine various aspects of both.

Organization design. Organization theory scholars have long discussed the challenge of using organizational features that make efficiency and flexibility possible. Thompson (1967) describes the trade-off between efficiency and flexibility as a central “paradox of administration” (p. 15). In their seminal work, Burns and Stalker (1961) argue that mechanistic structures—which rely on standardization, centralization, and hierarchy—support efficiency, whereas organic structures—with their high levels of decentralization and autonomy—support flexibility. Duncan (1976) suggests that organizations require both structures: organic to create innovations and mechanistic to implement and deploy them. Several authors argue that mechanistic and organic structures are difficult to reconcile within a single firm (Ford & Ford, 1994; Lawrence & Lorsch, 1967; Lewis, 2000). Conversely, recent studies often claim that firms may resolve the paradox by combining mechanistic and organic features (Adler et al., 1999; Jansen et al., 2005a; Sheremata, 2000) or developing a collective organizational context (Gibson & Birkinshaw, 2004). From this perspective, ambidexterity can be defined as a firm’s ability to operate complex organizational designs that provide for short-term efficiency and long-term innovation (Tushman & O’Reilly, 1996).

Major Themes and Research Approaches

As described above, most prior literature has focused on different elements of organizational ambidexterity. In these studies, organizational ambidexterity was related to firms’ ability to simultaneously pursue double-loop and single-loop learning, incremental and radical innovation, stability and transformation in organizational adaptation, induced and autonomous strategic processes, and efficiency and flexibility in organizational design. In contrast, far less research has traditionally been devoted to how organizations achieve organizational ambidexterity (Adler et al., 1999; Siggelkow & Levinthal, 2003). Over the past decade, however, researchers have started to investigate the antecedents of organizational ambidexterity. Studies have described organizational structures, behavioral contexts, and leadership processes as promoters of ambidexterity. Researchers have also looked into the

Figure 1
A Framework for Understanding Organizational Ambidexterity Research



performance outcomes of organizational ambidexterity. Recently, some scholars have begun to propose and test interrelations that are even more complex. They consider how environmental factors and other moderators affect the relationship between antecedents, elements of ambidexterity, and firm performance.

We reviewed key studies on the subject that have mainly been published in leading management journals such as *Academy of Management Journal*, *Academy of Management Review*, *Administrative Science Quarterly*, *Journal of Management*, *Journal of Management Studies*, *Organization Science*, and *Strategic Management Journal* since 1991. We did, however, also consider earlier publications that have resurfaced in the current debate, as well as selected discussion papers yet to be published. Our review resulted in the development of a framework (see Figure 1) that integrates the antecedents, environmental influences, moderators, and performance outcomes of organizational ambidexterity. Most of the reviewed studies focus on the structural antecedents and the effect of ambidexterity on firm performance. Findings on other relevant constructs or on more complex relationships moderated by additional variables are scarcer. Our framework nevertheless provides researchers working in the field with a comprehensive overview and reveals the areas that require further analysis. In addition, we provide a short review of 20 important articles on organizational ambidexterity in Table 1.

(text continues on p. 389)

Table 1
Summary of Selected Research on Organizational Ambidexterity (1991-2007)

Studies / Year	Research Focus ^a	Theoretical Lens	Methodology	Key Findings
Adler, Goldoftas, & Levine (1999)	Antecedents (1, 1-2)	Organizational design	Field study of the Toyota Production System	In a case study of the Toyota Production System, the authors describe the functioning of four organizational mechanisms - metaroutines, partitioning, switching, and ambidexterity - used in the production process to manage the efficiency and flexibility paradox.
Auh & Menguc (2005)	Environmental factors; performance outcomes (2-3, 3, 4)	Strategic management	Survey of 260 Australian manufacturing firms	The study explores the contingency role that competitive intensity plays in explaining the relationship between exploitation/exploitation and firm performance. The results show that defenders benefit from exploration while prospectors benefit from exploitation as competition increases.
Beckman (2006)	Antecedents (1, 1-2)	Leadership theory	Survey of 170 U.S. high-tech firms	The results suggest that team composition is an important antecedent of firm ambidexterity. Founding teams with common prior company affiliations engaged in exploitation, whereas diverse prior affiliations encouraged exploration. A mix of common and diverse prior affiliations was found to be a precursor of ambidexterity.

(continued)

Table 1 (continued)

Studies / Year	Research Focus ^a	Theoretical Lens	Methodology	Key Findings
Bradach (1997)	Antecedents (1, 1-2, 2-3)	Organizational design	Field study of five large U.S. restaurant chains	From interview and observational data, the authors model how chains use a plural form-the simultaneous use of company and franchise units-to achieve uniformity and system-wide adaptation. The simultaneous use of different structures was found to enhance the performance of the chain.
Burgelman (1991)	Ambidexterity (2, 2-3)	Strategic Management; organizational adaptation	Inductive field study of Intel Corporation	The paper presents an intraorganizational ecological perspective on strategy making and organizational adaptation. Consistently successful organizations are expected to simultaneously exercise induced and autonomous strategic processes. The paper examines implications of coevolutionary lock-in in terms of its effect on balancing induced and autonomous strategy processes and exploitation and exploration in organizational learning. Co-evolutionary lock-in is shown to arise from an extremely focused induced-strategy process.
Burgelman (2002)	Ambidexterity (2, 2-3)	Strategic management; organizational learning	Longitudinal inductive field study of Intel Corporation	

(continued)

Table 1 (continued)

Studies / Year	Research Focus ^a	Theoretical Lens	Methodology	Key Findings
Danneels (2002)	Ambidexterity (2)	Technological innovation; organizational learning	Field research in five high-tech firms	A typology is derived that classifies new product projects based on whether they draw on existing competences, or whether they require new com- petences. Following organiza- tional learning theory, these options are conceptualized as exploitation and exploration.
Ebben & Johnson (2005)	Other moderators (2, 2-3, 5-3)	Strategic management	Archival study of 200 and survey of 144 privately held U.S. firms	Using configuration theory, the authors show that small firms that pursue efficiency strategies or flexibility strategies outper- form those that attempt to pur- sue both. Size is used as a configurational attribute to develop hypotheses on how pure and mixed strategies affect small firm performance.
Gibson & Birkinshaw (2004)	Antecedents; performance outcomes (1, 1-2, 2-3)	Organizational design	Survey of 4,195 employees in 41 business units of 10 multinational firms	The findings suggest that a context characterized by a combination of stretch, discipline, support, and trust facilitates contextual ambidex- terity. Ambidexterity is found to mediate the relationship between context and firm performance.

(continued)

Table 1 (continued)

Studies / Year	Research Focus ^a	Theoretical Lens	Methodology	Key Findings
Gupta, Smith, & Shalley (2006)	Ambidexterity (2, 2-3)	Organizational learning	Conceptual paper	Theory paper addressing four related questions: What do exploration and exploitation mean? Are they two ends of a continuum or orthogonal to each other? How should organizations achieve balance between exploration and exploitation? Should all organizations strive for a balance or not?
He & Wong (2004)	Performance outcomes (2-3, 3)	Organizational learning; technological innovation	Survey of 206 manufacturing firms in Singapore and Malaysia	The authors find evidence for the ambidexterity hypothesis by demonstrating that the interaction between explorative and exploitative innovation is positively related to sales growth and that the relative imbalance between both innovation types is negatively related to sales growth.
Jansen, van den Bosch, & Volberda (2005a)	Antecedents; environmental factors (1, 1-2, 4-3, 4)	Technological innovation	Survey of 363 unit managers of a large European financial services firm	The study reveals that multunit firms develop ambidextrous organizational units to compete in dynamically competitive environments. Moreover, the authors establish that units with decentralized and densely connected social relations are able to act ambidextrously.

(continued)

Table 1 (continued)

Studies / Year	Research Focus ^a	Theoretical Lens	Methodology	Key Findings
Jansen, van den Bosch, & Volberda (2006)	Antecedents; environmental factors; performance outcomes (1, 1-2, 2-3, 4-3, 4)	Technological innovation	Survey of 283 unit managers of a large European financial services firm	The results indicate that centralization negatively affects exploratory innovation, whereas formalization positively affects exploitative innovation. Pursuing exploratory innovation was found to be more effective in dynamic environments and pursuing exploitative innovation was more beneficial in competitive environments.
Kyriakopoulos & Moorman (2004)	Other moderators (2-3, 5, 5-3)	Marketing	Survey of 75 Dutch business units of packaged food producers	Market orientation is found to facilitate a complementarity of high levels of marketing exploitation and marketing exploitation strategies that results in improved new product financial performance.
Levinthal & March (1993)	Ambidexterity (2, 2-3)	Organizational learning	Conceptual paper	The paper describes three forms of learning myopia that may undermine the organization's ability to explore, as well as a range of solutions that organizations may use to sustain exploration in the face of a tendency to become overly focused on exploitation.

(continued)

Table 1 (continued)

Studies / Year	Research Focus ^a	Theoretical Lens	Methodology	Key Findings
Lubatkin, Simsek, Ling, & Veiga (2006)	Antecedents; performance outcomes (1, 2-3, 3)	Leadership theory	Survey of top managers from 139 small to medium-sized enterprises (SMEs)	Top management team behavioral integration is found to facilitate the processing of disparate demands essential to attaining ambidexterity in SMEs. Furthermore, the findings suggest that the joint pursuit of an exploratory and exploitative orientation affects performance. The paper considers the relation between exploration and exploitation. It examines the complications in allocating resources between the two and points to the risks inherent in a one-sided orientation.
March (1991)	Ambidexterity (2, 2-3)	Organizational learning	Conceptual paper	Analyzing corporate crises, the authors reveal a mutual logic of failure. In most cases, companies grew and changed too quickly. Conversely, if these factors were insufficiently developed, companies aged prematurely, which likewise led to failure. To sustain success, companies have to keep a balance between these extremes.
Probst & Raisch (2005)	Ambidexterity (2, 2-3)	Organizational adaptation	Field research in 52 multinational firms	

(continued)

Table 1 (continued)

Studies / Year	Research Focus ^a	Theoretical Lens	Methodology	Key Findings
Smith & Tushman (2005)	Antecedents (1, 1-2)	Organizational Design; leadership theory	Conceptual paper	Using the literature on paradox, contradictions, and conflict, the authors develop a model for managing strategic contradictions and identifying leadership conditions that facilitate a team's ability to engage in paradoxical cognitive processes.
Tushman & O'Reilly (1996)	Antecedents; ambidexterity (1, 1-2, 2)	Organizational design	Field research in multinational firms	The authors develop the idea of ambidextrous organizations. Following a discussion of the nature of change and the need for organizational adaptation, the structural, cultural, and leadership requirements of ambidextrous organizations are presented in detail.

a. The figures in parentheses refer to the numbers used in Figure 1.

Research on Organizational Antecedents

How do organizations balance and synchronize exploitative and exploratory activities? One suggestion to resolve the paradoxical requirements has been to externalize either exploitative or explorative activities through outsourcing or by establishing alliances (Baden-Fuller & Volberda, 1997; Holmqvist, 2004; Lavie & Rosenkopf, 2006; Rothaermel & Deeds, 2004). Another suggestion has been that firms should temporarily cycle through periods of exploitation and periods of exploration (S. L. Brown & Eisenhardt, 1998; Nickerson & Zenger, 2002; Siggelkow & Levinthal, 2003; Venkatraman, Lee, & Iyer, 2007). These two solutions have in common that organizations resolve the paradox by engaging in only one activity at a time, and as such we do not consider them further in this article.

Conversely, organizational ambidexterity requires firms to address exploitation and exploration simultaneously and internally (Gibson & Birkinshaw, 2004; Tushman & O'Reilly, 1996). Organizational ambidexterity is more than the simple presence of both exploitation and exploration. March (1991) argues that exploitation and exploration are two facets of organizational learning that are inseparable. Floyd and Lane (2000) describe exploitation and exploration as interdependent processes that need to be combined and embedded to generate synergistic outcomes. According to O'Reilly and Tushman (2007), ambidexterity only becomes a dynamic capability if the firm's exploitation and exploration activities are strategically integrated. Strategic integration requires a common set of values, a shared vision, and an overarching governance process. Benner and Tushman (2003) thus conclude that the externalization of exploitation or exploration processes may be harmed by the difficulties in realizing strategic integration across independent firms. However, managing two inconsistent alignments within an organization simultaneously is far more complex than managing one consistent strategy after the other or externalizing one of these activities (Gupta et al., 2006). The literature has focused on three broad approaches that enable ambidexterity within an organization: structural solutions that allow two activities to be carried out in different organizational units, contextual solutions that allow two activities to be pursued within the same unit, and leadership-based solutions that make the top management team responsible for reconciling and responding to the tensions between the two activities.

Structural antecedents. According to Gibson and Birkinshaw (2004), ambidexterity in organizational structures is achieved by "developing structural mechanisms to cope with the competing demands faced by the organization for alignment and adaptability" (p. 211). Various ideas have been presented regarding what these structural mechanisms should look like. The ideas include semi-structures that enable organizational units to alternate between both requirements (S. L. Brown & Eisenhardt, 1997) and complex structures that combine organic and mechanistic structural elements (Adler & Borys, 1996; Sheremata, 2000). Brouthers, Brouthers, and Sleeman (1999), for example, explore seven structural elements to resolve the organizational paradox in the context of the transnational corporation. Aside from these more general insights, a range of concrete structural solutions has been presented in support of ambidexterity. Most of these solutions are related to two basic underlying concepts: spatial separation and parallel structures.

Much of the existing literature equates structural ambidexterity with spatial separation at the business unit or corporate level. The trade-off is addressed by creating separate units that

pursue either exploitation or exploration (Duncan, 1976). Such spatial separation ensures that each organizational unit is configured according to its task environment's specific requirements (Lawrence & Lorsch, 1967). Although organizational units pursuing exploration are expected to be small and decentralized with loose processes, organizational units that pursue exploitation are expected to be larger, more decentralized, and with tight processes (Benner & Tushman, 2003; Tushman & O'Reilly, 1996). The structural differentiation can help ambidextrous organizations to maintain different competencies that address inconsistent demands (Gilbert, 2005).

A theoretical discussion has evolved around the question of whether and to what extent these units should be integrated. Some scholars argue in favor of creating loosely coupled organizations in which the explorative units are strongly buffered against the exploitative units (Leonard-Barton, 1995; Levinthal, 1997; Weick, 1976). At the extreme, Christensen (1998) suggests that exploratory units need to be completely separated from exploitative units to be able to pursue disruptive innovation. In contrast, others promote organizational architectures that combine both tight and loose coupling (Bradach, 1997; Tushman & O'Reilly, 1997). O'Reilly and Tushman (2004), for example, describe ambidextrous organizations that are composed of multiple tightly coupled subunits that are themselves loosely coupled with one another. The contrasting units are physically and culturally separated from one another and have different incentive systems and managerial teams. Strategic integration across units is achieved through coordination at the senior management level and a strong, widely shared corporate culture. O'Reilly and Tushman (1997) provide case studies of Ciba Vision and *USA Today* to illustrate the concept of spatial separation. Bradach (1997) uses data from a field study of five U.S. restaurant chains to describe how they use a "plural form"—the simultaneous use of company and franchise units—to balance company-wide alignment and adaptation to changing markets.

In contrast to the spatial separation concept that dominates current research, several earlier studies described an alternative path to structural ambidexterity. The use of parallel structures allows people to switch back and forth between two (or more) types of structures, depending on the structure that their specific task requires (Bushe & Shani, 1991; McDonough & Leifer, 1983; Stein & Kanter, 1980; Zand, 1974). A unit's formal primary structure can be used for routine tasks and for maintenance of stability and efficiency. Additional secondary structures (such as project teams or networks) balance the primary structure's shortcomings and support nonroutine tasks and innovation (Goldstein, 1985). The supplementary structure coexists with the primary task structure to ensure efficiency and flexibility (Adler et al., 1999). Contrary to the spatial separation concept, parallel structures therefore allow competing demands for exploitation and exploration to be addressed within a single business unit (Gibson & Birkinshaw, 2004). McDonough and Leifer (1983) empirically examine the use of parallel structures in 21 work units within a manufacturing and an insurance company. Nonaka (1994) presents the "hypertext organization," which combines the "efficiency and stability of a hierarchical bureaucratic organization with the dynamism of the flat, cross-functional task force organization" (p. 33). The concept is later illustrated with case studies from Japanese and Western companies (Nonaka & Takeuchi, 1995).

Contextual antecedents. Gibson and Birkinshaw (2004) define *contextual ambidexterity* as "the behavioral capacity to simultaneously demonstrate alignment and adaptability across

an entire business unit" (p. 209). Rather than creating dual structural arrangements, leaders are expected to create a supportive business-unit context. Context refers to the systems, processes, and beliefs that shape individual-level behaviors in an organization (Ghoshal & Bartlett, 1994). This context should be designed to enable and encourage all individuals to judge for themselves how to best divide their time between the conflicting demands for exploitation and exploration. Gibson and Birkinshaw point to earlier recommendations on how to support contextual ambidexterity, including the use of meta-routines and job-enrichment schemes (Adler et al., 1999), the use of leaders with complex behavioral repertoires (Denison et al., 1995; Lewis, 2000), and the creation of a shared vision (Bartlett & Ghoshal, 1989). They claim, however, that these suggestions cover only parts of the issue and fail to provide a sufficient context for ambidexterity. Based on earlier work by Ghoshal and Bartlett (1994), Gibson and Birkinshaw suggest contexts characterized by a combination of stretch, discipline, support, and trust to facilitate contextual ambidexterity. Successful organizations are expected to balance the hard elements (discipline and stretch) and the soft elements (support and trust) in their organizational contexts. On analyzing data collected from 41 business units, Gibson and Birkinshaw find empirical evidence that it is possible to achieve ambidexterity through contextual support and that this does relate positively to performance.

Leadership-based antecedents. As key leaders in organizations, senior executives are regarded as playing an important role in fostering ambidexterity. Tushman and O'Reilly (1997) state that ambidexterity is facilitated by the top-management team's internal processes. Several studies described leadership processes as a supporting factor when implementing structural or contextual ambidexterity. Gibson and Birkinshaw (2004), for example, note the "important role played by senior executives in making an organization context effective and developing ambidexterity" (p. 223). Similarly, Smith and Tushman (2005) explore the integrative mechanisms by which leadership teams might successfully manage the contradictions that arise from structural separation in ambidextrous organizations.

Contrary to the studies mentioned above, an emergent group of researchers conceptualizes leadership processes as an independent antecedent of organizational ambidexterity (Lubatkin et al., 2006). Some proponents of this theory relate exploitation and exploration activities to an organization's different hierarchical management levels. Floyd and Lane (2000), for example, relate exploration to the operating levels where managers experiment with novel solutions to emerging problems and the subsequent exploitation to the top-management levels where promising solutions are selected and leveraged. Other scholars suggest that top management may also pursue exploitation and exploration simultaneously. Volberda et al. (2001) note, "top management explicitly manages the balance of exploration and exploitation by bringing in new competencies to some units while utilizing well-developed competencies in others" (p. 165). Smith (2006) describes top-management teams that dynamically shift their resources between the existing products and innovations to support both simultaneously.

Recently, researchers have begun to investigate characteristics and processes that enable top-management teams to simultaneously pursue exploitation and exploration. Beckman (2006) found empirical evidence that the founding team composition—in particular, members' prior company affiliations—is an important antecedent of exploitative and explorative behavior. Firms whose founding teams had both diverse and common prior company affiliations demonstrated

a higher degree of ambidexterity. Peretti and Negro (2006) found similar results in respect of a mix between “newcomers” and “old timers” in team composition. Lubatkin et al. (2006) describe “behavioral integration”—the degree of senior management team’s wholeness and unity of effort—as an important precursor of organizational ambidexterity. Behavioral integration depends on the level of the team’s collaborative behavior, the quantity and quality of information exchanged, and the emphasis on joint decision making. They found empirical evidence of behavioral integration’s positive effect on both exploitation and exploration.

Research on Performance Outcomes

Does the simultaneous pursuit of exploitation and exploration compromise the potential value of each one on its own? March (1991) contends that given the inherent challenges of maintaining a balance between the two activities, firms run the risk of being mediocre at both. Pursuing this point of view, some researchers suggest that firms need to make choices that favor one activity over the other (Barney, 1991; Ghemawat & Ricart i Costa, 1993; Miller & Friesen, 1986; Porter, 1980). Wernerfelt and Montgomery (1988), for example, argue that firms pursuing both activities simultaneously are sacrificing internal consistency, which may lead to inferior performance if compared to more focused firms. These arguments are, however, contrary to March’s belief that firms have to pursue both types of activities, despite the challenges involved. March states that problems and tensions will invariably arise if firms focus on one of these at the expense of the other. These arguments have led to the popular “ambidexterity premise.”

The ambidexterity premise. Tushman and O’Reilly (1996) suggest that firms capable of simultaneously pursuing exploitation and exploration are more likely to achieve superior performance than firms emphasizing one at the expense of the other. Firms that principally pursue exploration run an inherent risk because their returns are difficult to estimate a priori and may take a long time to materialize, if at all. These firms assign scarce resources to exploration without gaining benefits from exploitation (Volberda & Lewin, 2003). Levinthal and March (1993) state, “an organization that engages exclusively in exploration will ordinarily suffer from the fact that it never gains the returns of its knowledge” (p. 105). Firms may become trapped in an endless downward cycle of search, failure, and unrewarding change. In contrast, firms that chiefly pursue exploitation usually achieve returns that are proximate and predictable but not necessarily sustainable. Levinthal and March (1993) argue that “an organization that engages exclusively in exploitation will ordinarily suffer from obsolescence” (p. 105). A narrow search may lead to increasingly rigid cognitive maps and highly specialized competencies that may become core rigidities (Leonard-Barton, 1992). A preponderance of exploitation may enhance short-term performance but can result in a competence trap as firms may not be able to respond adequately to environmental changes (Ahuja & Lampert, 2001; Levitt & March, 1988).

Firms’ ability to compete successfully in the long run may thus be rooted in an ability to jointly pursue exploitation and exploration. Scholars have long argued that organizational ambidexterity is a key driver of long-term firm performance. Floyd and Lane (2000), for

instance, suggest that firms must “exploit existing competencies and explore new ones—and more importantly, that these two facets of organizational learning are inseparable” (p. 155). The ability to achieve ambidexterity has been said to lie at the heart of a firm’s dynamic capabilities (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997). Recently, researchers have started to empirically examine whether organizational ambidexterity leads to higher performance levels.

Empirical tests. Despite the rapidly expanding number of studies referring to organizational ambidexterity, empirical tests of the ambidexterity–performance relationship remain scarce. In prior studies, Adler et al. (1999) and Knott (2002) found that exploration and exploitation coexisted in Toyota’s product development and production processes. Katila and Ahuja (2002) found a positive interaction effect between (proxies for) exploitation and exploration learning but did not test their effects on firm performance.

He and Wong (2004) were the first to formally test the ambidexterity hypothesis in the context of technological innovation strategies. Based on a sample of 206 manufacturing firms, they found evidence that (a) the interaction between exploitative and explorative innovation strategies is positively related to sales growth rate and (b) the relative imbalance between exploitative and explorative innovation strategies is negatively related to sales growth rate. Whereas He and Wong tested the ambidexterity hypothesis at the firm level, Gibson and Birkinshaw (2004) focused on the business-unit level. Based on data collected from 4,195 individuals in 41 business units, the authors found evidence that a business unit’s capacity to simultaneously achieve alignment and adaptability was significantly related to its performance. Lubatkin et al. (2006) tested organizational ambidexterity’s effect on firm performance using survey data from 139 small- and medium-sized enterprises. They found that the joint pursuit of an exploitative and exploratory orientation positively affects performance. Finally, Venkatraman et al. (2007) tested the impact of ambidexterity on firm performance using a sample of 1,005 software firms. Contrary to prior findings, they did not receive empirical support for the ambidexterity hypothesis. Instead, they found that temporal cycling between exploitation and exploration has a positive effect on firm performance. In sum, the empirical evidence of the organizational ambidexterity–performance relationship remains limited and mixed.

Research on Environmental Factors

A key characteristic of the organizational theory discipline is its emphasis on a firm’s environment. Several scholars have argued that the level of dynamism and competitiveness in a business environment may be an important boundary condition for organizational ambidexterity (i.e., Gibson & Birkinshaw, 2004; Levinthal & March, 1993; Siggelkow & Levinthal, 2003; Volberda, 1998). Lewin, Long, and Carroll (1999), for example, outlined a model of organization–environment coevolution that relates firm-level exploitation and exploration to changes in the population of competing firms. The emerging contingency perspective underscores the effectiveness of a firm’s exploitation and exploration under different contextual conditions. Research can be clustered into three fields: studies analyzing how environmental conditions (a) directly influence a firm’s organizational ambidexterity,

(b) moderate the relationship between ambidexterity and performance, and (c) moderate the relationship between antecedents and ambidexterity.

Direct effect on organizational ambidexterity. Researchers have argued that local environmental aspects such as dynamism and competitiveness can require firms to become ambidextrous (Floyd & Lane, 2000; Levinthal & March, 1993; March, 1991; Volberda, 1998). As competition intensifies and the pace of change accelerates, firms are increasingly confronted with a tension between exploiting existing capabilities and exploring new ones. Jansen et al. (2005a) were first to empirically examine the proposition that the “extent to which units pursue both types of innovations simultaneously is shaped by local environmental conditions” (p. 352). They found empirical support that firms operating in an environment characterized by high dynamism and competitiveness are more likely to simultaneously pursue both types of innovation and thus become ambidextrous. Similarly, Auh and Menguc (2005) found that firms strike a balance between exploitation and exploration when faced with increasing environmental competitiveness. Raisch and Hotz (in press) show that companies moved toward a more balanced orientation in their strategic and structural alignment when environmental conditions became increasingly hostile.

Moderation of the ambidexterity–performance linkage. Both Levinthal and March (1993) and Lewin et al. (1999) expected environmental dynamism and competitiveness to moderate the relationship between exploitation, exploration, and performance. Jansen, van den Bosch, and Volberda (2006) empirically determined that pursuing exploratory innovation is more effective in dynamic environments, whereas pursuing exploitative innovation is more beneficial to a unit’s financial performance in more competitive environments. Although they were not explicitly testing for an ambidextrous orientation, the results indicated a positive performance effect of simultaneously pursuing exploitative and exploratory innovation in periods of highly competitive rivalry. The authors argue that companies may need to engage in some degree of explorative innovation to enable them to elude the downward spiral caused by increasing competitive rivalry. Raisch and Hotz (in press) formally tested for the performance effects of exploitative, explorative, and balanced corporate alignment activities under varying environmental conditions. They used the “environmental munificence” construct that reflects an industry’s opportunities and dynamism (Zahra, 1993). Although exploration was positively related to performance in times of high environmental munificence, a balanced orientation failed to significantly affect performance in times of low environmental munificence. The authors explained this result with nearly all firms in the sample having moved toward a more balanced orientation. They suggested that in times of increasing environmental hostility, organizational ambidexterity may be more of a necessity than a differentiating factor leading to superior short-term performance.

Moderation of the antecedent–ambidexterity linkage. Several studies on organizational ambidexterity’s antecedents include references to external boundary conditions. Tushman and O’Reilly (1996), for example, describe the spatial separation concept as appropriate solution for environments characterized by long periods of stability, disrupted by rare events of discontinuous change. Despite these references, very few studies have formally considered

external conditions' influence on the structural, contextual, and leadership-based antecedents of organizational ambidexterity. Exceptions include Jansen et al. (2005a) who found that firms operating in dynamic competitive environments rely on contextual ambidexterity rather than developing spatially separated units.

Research on Other Moderators

The literature suggests several other moderators to explain conflicting findings in respect of the organizational ambidexterity construct. Firm-specific factors include market orientation, resource endowment, and firm scope.

Market orientation. Market orientation has been defined as the firm's capability to generate, disseminate, and respond to intelligence pertaining to current and future customers (Kohli & Jaworski, 1990; Narver & Slater, 1990). Based on longitudinal data from the Dutch packaged food industry, Kyriakopoulos and Moorman (2004) find that market orientation positively moderates the impact of pursuing high levels of exploitative and exploratory marketing strategies on new product performance. Conversely, firms that pursue an ambidextrous orientation without strong market orientation display a significant reduction in new product financial performance. Atuahene-Gima (2005) also found that market orientation—reflected by the two dimensions customer and competitor orientation—guides managerial decisions toward simultaneously allocating resources to exploit existing product innovation competencies as well as to developing new innovation capabilities.

Resource endowment. Several researchers argue that firm resource differences may moderate ambidexterity's effect on performance (Kyriakopoulos & Moorman, 2004; Venkatraman et al., 2007). Rich firms have the resources to exploit and explore simultaneously, whereas firms with less resources may not be able to afford such a complex strategy. Similarly, Lubatkin et al. (2006) state that small firms "lack the amount of slack resources and the kind of hierarchical administration systems that can help or impede larger firms in managing their contradictory knowledge processes and, thus, affect the attainment of ambidexterity" (p. 647). Ebben and Johnson (2005) empirically show that small firms may benefit more from a one-sided orientation than from mixed strategies. Jansen et al. (2006) find the simultaneous pursuit of both exploitative and exploratory innovation decreases a unit's slack. These results suggest that organizational ambidexterity may be contingent on the availability of sufficient resources.

Firm's scope. Lubatkin et al. (2006) argue that structural ambidexterity may be more appropriate for large and diversified firms, whereas smaller or more focused firms may benefit more from leadership-based ambidexterity. Smaller and focused firms have fewer hierarchical levels and their top managers are thus more likely to play strategic and operational roles and address both exploitation and exploration. Conversely, large firms have many organizational impediments and multifaceted external influences that are likely to dilute the effect of top-management team behavioral integration. Gibson and Birkinshaw (2004)

expect contextual ambidexterity to be more appropriate for small firms or limited to the business-unit level at large firms.

Synthesis of Organizational Ambidexterity Research and Areas for Future Research

Organizational ambidexterity is currently taking shape as a research paradigm in organizational theory. A paradigm is a theoretical framework of a scientific school or discipline within which theories, generalizations, and the methods to test them are formulated (Kuhn, 1962). Based on prior work by Dubin (1978), Fry and Smith (1987) defined four conditions that theories have to meet to move a field from the conceptual (or preparadigmatic) stage of development toward paradigmatic status. The theory has to specify: the units or variables of interest; congruence, as defined by the laws of relationships, between the model's variables of interest that specify how they are associated; boundaries within which the laws of relationships are expected to operate; and contingency effects that specify system states within which the units of the theory take on characteristic values that are deterministic and persist over time. In the following, we consider to what extent these conditions have been met by the existing research on organizational ambidexterity. We also identify important gaps and point to future research avenues.

Variables of Interest

Research on organizational ambidexterity has addressed a large variety of variables of interest, including antecedents, environmental and other moderators, and outcomes. Despite these rich foundations, the organizational ambidexterity concept would benefit from future work to specify the level of analysis as well as to substantiate and extend the existing theoretical insights.

Specify the level of analysis. Ambidexterity research has usually focused on the corporate (e.g., He & Wong, 2004) or business unit (e.g., O'Reilly & Tushman, 2004) as the level of analysis, but some studies have focused on suborganizational units, such as Adler et al.'s (1999) study of a manufacturing operation or Birkinshaw and Hill's (2007) study of ambidexterity within a corporate venturing unit. The level of analysis is vitally important, because choices about how to resolve the tension at one level of analysis are often resolved at the next level down. So for example, a business unit may become ambidextrous by creating two functions or subdivisions with different foci, a manufacturing plant may become ambidextrous by creating two different teams (one in charge of enhancements to flexibility and another in charge of efficiency improvements), and a single team may become ambidextrous by allocating different roles to each individual. All these levels of analysis are equally valid, but it is important that researchers are explicit about the level they are working at to avoid confusion and inconsistency. It is also important for researchers to distinguish between the level at which ambidexterity is held (i.e., where the tension between exploration and exploitation is felt) and the level at which it is resolved (e.g., where structural separation

occurs). In addition, we would like to accentuate the need for studies spanning multiple levels of analysis. For example, Mom et al.'s (2007) research indicates that firm-level or unit-level exploitation or exploration may largely originate from their individual managers' exploitation or exploration activities. Further research should, as noted above, be explicit about the levels of analysis it addresses and the ways in which those levels interact with one another. Multilevel concepts and measures may be required to fully capture a firm's exploitation and exploration activities.

Substantiate the organizational ambidexterity concept. In addition to the lack of precision around the level of analysis, there have also been shortcomings in other aspects of the ambidexterity construct. These shortcomings are particularly obvious in the research on organizational ambidexterity's antecedents. Most studies have equated organizational ambidexterity with establishing structurally separate units for exploitation and exploration. Despite this preference for structural separation, key elements of the concept remain to be analyzed. Interunit coordination and integration, for example, is one of structural separation's main challenges (Adler et al., 1999; Gibson & Birkinshaw, 2004; Siggelkow & Rivkin, 2006). Knowledge integration may be harmed by a lack of direct transmission channels and the institutional distance caused by hierarchical coordination (Hansen, 2002; Kostova & Zaheer, 1999). Exploratory units may thus encounter difficulties in leveraging existing technological or market know-how (Hill & Rothaermel, 2003). There is an apparent lack of research on how ambidextrous organizations deal with these challenges.

Even less is known about contextual ambidexterity: Research has so far been limited to a few studies (i.e., Gibson & Birkinshaw, 2004). In this approach, ambidexterity is rooted in an individual's ability to explore and exploit. Among others, March (1991) has described the cognitive limits that individuals encounter when trying to simultaneously approach both learning processes. With the notable exception of Mom et al. (2007), there is a complete lack of research into ambidexterity at the individual level of analysis. Detailed case studies, as well as broader field studies, could help to further substantiate our understanding of contextual ambidexterity.

There has been a greater interest in research on leadership-based antecedents of organizational ambidexterity during the past few years. Recommendations from these studies are, however, partly contradictory. Although some scholars relate exploitation and exploration to different hierarchical levels (e.g., Floyd & Lane, 2000), others describe characteristics that enable teams to simultaneously pursue both learning processes (e.g., Lubatkin et al., 2006). Future research should investigate whether these solutions are complementary or mutually exclusive. It would also be interesting to look into the two solutions' performance implications as well as the respective boundary conditions.

Extend the organizational ambidexterity concept. Extending this concept's foundations refers to the current debate being almost exclusively dedicated to questions of organizational design and leadership, while largely ignoring strategic elements. Decades of management research have revealed how closely interlinked strategic and organizational activities are (e.g., Amburgey & Dacin, 1994). Future research should thus complement the existing antecedents by developing the concept of strategic ambidexterity. Extensive research on strategy—at the business unit and corporate level—provides a starting point for these efforts.

At the business-unit level, efficiency-oriented business strategies have been related to exploitation and innovation-oriented business strategies to exploration (Adler et al., 1999; Auh & Menguc, 2005; March, 1991). The distinction between efficiency and innovation is reflected by Porter's (1980) cost leadership and differentiation strategies. Porter argues that firms have to choose between these strategies. Firms that pursue mixed strategies risk becoming "stuck in the middle," which may lead to poor performance. Conversely, subsequent studies argue that firms may indeed benefit from mixed or balanced strategies that combine elements of both cost leadership and differentiation strategies (Parnell, 1997; Wright, Kroll, Tu, & Helms, 1991). Parnell and colleagues (i.e., Parnell, Lester, & Menefee, 2000; Parnell & Wright, 1993) published several empirical studies revealing that a balanced strategy leads to superior performance. Thornhill, White, and Raynor (2007) find that balanced companies enjoy lower risks and lower exit rates than pure players. Markides and Charitou (2004) describe how firms can develop and execute balanced strategies. Among others, they describe firms with dual strategies pursuing two fundamentally different business models within the same market, as well as firms with a hybrid strategy addressing differentiation and cost advantages within the same business model.

At the corporate level, Burgelman (1991, 2002) has related induced strategy processes to exploitation and autonomous strategy processes to exploration. Without making reference to Burgelman's work, strategy research provides insights with regard to how managers may enable organizations to strike a balance between these processes along two dimensions: the direction and the mode of corporate development. As for the direction of firm development, researchers have related a focus on existing products and markets to both the efficient exploitation of existing resources (Markides, 1995; Wernerfelt & Montgomery, 1988) and the failure to explore new capabilities (Burgelman, 2002; Leonard-Barton, 1992). Conversely, diversification into new fields has been related to effective exploration of new capabilities (Barkema & Vermeulen, 1998; Miller & Chen, 1996) as well as the failure to efficiently exploit existing resources (Helfat & Raubitschek, 2000). To enable a balanced learning behavior, various studies have thus suggested that firms should simultaneously pursue further growth in their core business and a limited expansion around that core (Burgelman, 1991; Helfat & Raubitschek, 2000; Vermeulen & Barkema, 2001; Zook, 2004). Van Looy et al. (2005) suggest that ambidexterity may be linked to a single core business being extended into closely related new areas.

In respect of the mode of firm development, researchers have linked internal growth to efficient exploitation and reuse of existing capabilities (Leonard-Barton, 1992; Miller, Lant, Milliken, & Korn, 1996) as well as to an increased risk of structural inertia that may harm the exploration of new ideas (Levinthal & March, 1993; Levitt & March, 1988). Conversely, external development through acquisitions was found to stimulate the exploration of new capabilities (Barkema & Vermeulen, 1998) as well as to harm exploitation by diverting attention and resources away from internal growth and innovation (Hitt, Hoskisson, Ireland, & Harrison, 1991; Laamanen & Keil, 2007). Consequently, in an empirical study, Vermeulen and Barkema (2001) reveal that internal growth and external growth contribute to different learning processes. The authors conclude that a firm's sustainable long-term success requires a balanced strategy that incorporates both modes of corporate development.

Future research could benefit by integrating the various findings from the strategic management literature presented above into the debate on organizational ambidexterity. This may be achieved through a comparative analysis of business strategies in different types of ambidextrous organizations. We expect, for instance, a high degree of strategic purity in structurally separated units although contextual ambidexterity may be linked to strategic plurality. At the corporate level, we expect ambidextrous leadership teams to pursue more balanced corporate development and growth strategies. Conceptualizing strategic ambidexterity allows concrete strategic actions to be captured that represent an important interface between organization or leadership designs and firm performance.

Congruence

The existing literature on organizational ambidexterity has specified and partially tested various relationships between the most relevant units of interest. Above, we described the most important relationships between the antecedents, moderators, and outcomes of organizational ambidexterity. In addition to the findings from this growing body of research, two relationship contexts have thus far been neglected or not been fully conceptualized: (a) the interrelations between different antecedents and (b) the complexity of the organizational ambidexterity–performance linkage.

Interrelations between antecedents. At first sight, organizational ambidexterity's antecedents, which include structural, contextual, and leadership-based factors, have been implicitly conceptualized as alternative solutions. Gibson and Birkinshaw (2004), for example, argue that an organization's capacity to simultaneously achieve exploitation and exploration is best achieved through contextual and not through structural ambidexterity. An in-depth analysis of these studies, however, reveals complementarities between the different paths to ambidexterity. Tushman and O'Reilly (1996), for instance, cite a common culture and vision, supportive leaders, and flexible managers as important requirements to enable structural ambidexterity. Gibson and Birkinshaw's notion of "organizational context" explicitly includes the structural context. They also point to the important role played by top-management teams in fostering contextual ambidexterity. Smith and Tushman (2005) describe the leadership processes required to enable structural ambidexterity. Finally, O'Reilly and Tushman (2007) state that organizational ambidexterity is "not simply a matter of structure" (p. 14). Aside from structural separation, they cite a clear strategic intent, an overarching vision and values, and an aligned senior team with the ability to manage trade-offs as organizational ambidexterity's most relevant antecedents. Future research could formally develop and test propositions on how different antecedents interact and complement one another in a firm's pursuit of organizational ambidexterity. This could also provide interesting insights into how antecedents from different organizational levels are interrelated in firms' pursuit of ambidexterity.

Complexity of the ambidexterity–performance linkage. Fry and Smith (1987) assigned particular relevance to the performance link when assessing emerging research paradigms. Although clearly within the focus of existing research, evidence of the linkage between

organizational ambidexterity and performance remains weak (Lavie & Rosenkopf, 2006; Lubatkin et al., 2006). Addressing these inherent challenges, researchers have started to consider internal and external boundary conditions when testing organizational ambidexterity's effect on performance (e.g., Jansen et al., 2005a). Furthermore, alternative measurements have been proposed for exploitation, exploration, and organizational ambidexterity (e.g., Gupta et al., 2006). We suggest that future research should consider two additional aspects of the ambidexterity–performance linkage.

First, studies should consider multiple performance dimensions. Auh and Menguc (2005) found empirical evidence that exploration was more positively associated with effective firm performance (measured by growth in sales, profits, and market share), whereas exploration was more positively related to efficient firm performance (measured by return on investment, return on sales, and return on assets). Studies deploying one-dimensional indicators of firm performance, such as sales growth (e.g., He & Wong, 2004), may thus run the risk of producing biased estimations of organizational ambidexterity's contributions to the firm's overall success.

Second, future research should consider organizational ambidexterity's short-term and long-term performance implications. Related research from the strategic management domain suggests that there are important differences. Thornhill and White (2007) found that firms with a one-sided focus on either cost leadership or differentiation outperformed firms with mixed strategies in terms of short-term operating margin. They also found that despite pure strategies' observable performance benefits, the vast majority of firms occupy strategic space's middle ground. The explanation was found in a follow-up study (Thornhill et al., 2007): Although pure players are more profitable, they also have higher risks and higher exit rates. The authors conclude that a middle position may be a rational choice that reflects firms' preference for growth and survival rather than short-term profit maximization. Similarly, Van Looy et al. (2005) argue that ambidexterity yields long-term payouts rather than the short-term maximization of profits. Cottrell and Nault (2004) suggest that the combination of exploitation and exploration is associated with longer survival. In an empirical study, Probst and Raisch (2005) find that balanced firms are less prone to failure than firms with a one-sided orientation. Assuming that the same logic applies to ambidextrous firms in general, the existing empirical studies' short-term focus on 1-year (Lubatkin et al., 2006) to 3-year (He & Wong, 2004) performance effects may underestimate organizational ambidexterity's more important contributions to the firm's long-term success. This assumption is in agreement with March's (1991) argument that benefits from explorative activities only become apparent in the long run, which is contrary to benefits generated by exploitative behaviors. Future studies should thus assess how organizational ambidexterity contributed to firms' long-term growth and survival.

Boundaries

Research on organizational ambidexterity has specified a range of important internal and external boundary conditions within which the hypothesized relationships occur. Despite the breadth of topics covered, this field of research requires additional work to deepen and refine its initial findings. In this section, we discuss (a) the need for a more granular view of the

boundaries that an ambidextrous firm faces, (b) the need for a more dynamic view of how ambidextrous organizations adapt to changing boundary conditions, and (c) the possible impact of the international context on the concept of ambidexterity.

Granular view of boundaries. Research into the boundaries that an ambidextrous firm faces frequently takes a system-level view of phenomena that actually vary at the subsystem level. A firm's innovation stream, for example, consists of various innovation initiatives (Tushman & Smith, 2002). The exploitation and exploration requirements may differ significantly from initiative to initiative (Lawrence & Lorsch, 1967; Thompson, 1967). Furthermore, even within each initiative, some components may be produced by exploiting existing capabilities, whereas developing others may rely on the exploration of new capabilities (Gatignon, Tushman, Smith, & Anderson, 2002). BMW's new Rolls-Royce Phantom model, for example, consists of components that were taken from BMW's existing 7-series cars (i.e., the V12 engine), components that were adapted to the luxury model's specific requirements (i.e., the aluminum space frame body), and components that were radically new to the firm (i.e., the rear-hinged doors). Given this variety, the analysis of boundary contexts at the business unit or corporate level may be misleading. Rather than all-or-nothing prescriptions at the system level, more granular analyses and recommendations may be required. In terms of structural solutions, for example, BMW may not benefit from simply integrating or structurally separating the Rolls-Royce unit. Instead, multiple (more or less integrated) organizational architectures may be required to meet the different innovation contexts inherent in this initiative. Future research should thus complement the system-level analysis of boundary conditions with a more fine-grained investigation of lower level task environments and their interrelations with ambidextrous structures, contexts, and leadership characteristics.

Evolution of ambidextrous organizations. Contrary to research on temporal cycling, the literature on organizational ambidexterity has frequently taken a static perspective of organizational behavior. Studies have shown, however, that organizations have to continuously reconfigure their activities to meet changing demands in their internal and external environments (e.g., Tushman & Anderson, 1986; Webb & Pettigrew, 1999). O'Reilly and Tushman (2007) argue that only if management can repeatedly and intentionally orchestrate firm assets and resources does ambidexterity become a dynamic capability. Dynamic capabilities comprise and integrate both static and dynamic components—the interaction of exploitation and exploration is thus assumed to become a full-blown dynamic capability over time (Schreyoegg & Kliesch-Eberl, 2007). Aligning organizations to exploitation and exploration may be a task of dynamic rather than static alignment.

If we take structural ambidexterity as an example, it appears unlikely that single designs (not even ambidextrous ones) provide the exhaustive steady-state functionality required to deal with the entire range of boundary conditions that an organization faces over time. Westerman, McFarlan, and Iansiti (2006) are among the few scholars who have examined how firms adapt organizational designs in the different stages of the innovation's life cycle. They have found that firms use one of three adaptation modes, none of which is fully autonomous or fully integrated, and all of which changed over time. Organizations thus use ambidextrous designs but adapt these over time. Future research should investigate how

organizations adapt and develop ambidextrous structures, contexts, and leadership patterns over time to respond to varying boundary conditions.

Such a process perspective requires a methodological shift in organizational ambidexterity research. Existing empirical studies mainly rely on cross-sectional survey data on managers' perceptions to measure ambidexterity constructs and boundary conditions (e.g., Gibson & Birkinshaw, 2004; Jansen et al., 2005a). Due to the limited reliability of informants' retrospective accounts (e.g., Golden, 1992), surveys are less appropriate for acquiring longitudinal data. One solution could be to focus on the actual realization of ambidexterity by deploying archival data on exploitative and explorative moves that have been implemented. Raisch and Hotz (in press), for example, consider insurance firms' strategic and organizational initiatives over a 10-year period and relate these to exploitation and exploration. The use of such proxies may help to overcome the present research's static character and contribute to the emergence of a process perspective of organizational ambidexterity.

International context. Finally, it is worth considering what impact—if any—the international context has on ambidexterity research. Like many strands of organizational research, the ambidexterity literature is often context free in that it does not explicitly consider the nature of the national business system or culture in which the empirical work is conducted. On the basis of our review, which spans studies done in at least 10 countries, we would not expect the structural antecedents of ambidexterity to be significantly influenced by international context, but we would expect both the contextual and leadership-based antecedents to be influenced by national-cultural differences between countries. For example, Gibson and Birkinshaw (2004) acknowledged some variation in contextual ambidexterity across the countries in their study. There is, however, little evidence on this point, and it would be useful for future research explicitly to consider whether there are national cultural or institutional boundaries around the concept of ambidexterity.

Contingency

As discussed thus far, Fry and Smith's (1987) analysis of a theoretical model required it to be composed of units of interest that are interrelated—according to specific laws—within defined boundaries. A fourth building block is, however, required to complete a theoretical model: contingency hypotheses. Specifying these hypotheses means explicitly stating a priori multiple system states in which the integrity of the model is maintained. An important avenue for future research could thus be to test whether the research field's existing propositions hold across multiple configurations of ambidextrous organizations.

There is a long tradition in the organizational literature of defining effective organizational configurations and distinguishing these from less effective ones (e.g., Meyer, Tsui, & Hinings, 1993; Miles & Snow, 1978; Mintzberg, 1979). Based on the existing theory of organizational ambidexterity, at least two alternative configurations may be derived: First, a balanced type that takes a mid-level position between exploitation and exploration, as reflected in the contextual ambidexterity construct as well as in the parallel structures and hybrid strategies concepts presented above. Second, a dual type with one part focused on exploitation and

another part focused on exploration, as in the spatial separation and the dual strategies concepts outlined above.

Although both solutions can be related to organizational ambidexterity, they strongly differ in the way they are configured. The balanced type may be consistent with the systems approach of fit across multiple dimensions (Drazin & Van de Ven, 1985; Nadler & Tushman, 1997), but this contradicts the notion that organizational choice is discrete (Meyer et al., 1993; Nickerson & Zenger, 2002). Various scholars argue that mixed strategies and structures lead to lower performance (Doty, Glick, & Huber, 1993; Miller & Friesen, 1986). Conversely, the dual type allows both discrete orientations and fit across dimensions at the unit level but creates a misfit between organizational units. Studies indicate that institutional distance as well as contradictory cultural contexts may harm knowledge exchange, the creation of cross-unit synergies, and ultimately, firm efficiency (Hansen, 2002; Kostova & Zaheer, 1999).

Given these apparent differences in the functionality provided, it would be particularly interesting for future research to test whether the laws of interaction, as established in the field to date, hold across both configurations. If so, this would be in line with the “equifinality premise” that multiple organizational configurations are equally effective (Gresov & Drazin, 1997). Alternatively, researchers may further investigate the external and internal contingencies under which different configurations can be found. A worthwhile endeavor could be, for example, to analyze how the speed and type of technological change confronting organizations affect these configurations’ usefulness. In slow-moving environments, there may be sufficient time to react to the rare events of radical change by constructing dual structures and strategies. In hypercompetitive environments, balanced structures and strategies may be better prepared to deal with the constant need for alignment. The different organizational ambidexterity configurations may, moreover, be compared to alternative solutions for dealing with the exploitation and exploration paradox, such as temporal cycling (e.g., Nickerson & Zenger, 2002) and externalizing (e.g., Lavie & Rosenkopf, 2006).

Conclusion

The approach taken in this review of research on organizational ambidexterity runs counter to the general trend in management research that strives for focused and highly specialized research. Instead, we provide the groundwork for an emerging theory of organizational ambidexterity that spans various, hitherto disconnected research fields and cuts across disciplines such as organizational learning, strategic management, leadership theory, and organizational design. The review aims at stimulating cross-fertilization across these disciplines and providing guidance for future research needed to advance the field from an emergent to a paradigmatic status.

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