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THE ANTECEDENTS, CONSEQUENCES, AND MEDIATING ROLE OF ORGANIZATIONAL AMBIDEXTERITY

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We investigated contextual organizational ambidexterity, defined as the capacity to simultaneously achieve alignment and adaptability at a business-unit level. Building on the leadership and organization context literatures, we argue that a context characterized by a combination of stretch, discipline, support, and trust facilitates contextual ambidexterity. Further, ambidexterity mediates the relationship between these contextual features and performance. Data collected from 4,195 individuals in 41 business units supported our hypotheses.

A recurring theme in a variety of organizational literatures is that successful organizations in a dynamic environment are *ambidextrous*—aligned and efficient in their management of today's business demands, while also adaptive enough to changes in the environment that they will still be around tomorrow (Duncan, 1976; Tushman & O'Reilly, 1996). The simple idea behind the value of ambidexterity is that the demands on an organization in its task environment are always to some degree in conflict (for instance, investment in current versus future projects, differentiation versus low-cost production), so there are always trade-offs to be made. Although these trade-offs can never entirely be eliminated, the most successful organizations reconcile them to a large degree, and in so doing enhance their long-term competitiveness.

Authors have typically viewed ambidexterity in structural terms. According to Duncan (1976), who first used the term, organizations manage trade-offs between conflicting demands by putting in place "dual structures," so that certain business units—or groups within business units—focus on alignment, while others focus on adaptation (Duncan, 1976).

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We refer to this as *structural ambidexterity*.¹ Increasingly, however, organizational scholars have recognized the importance of simultaneously balancing seemingly contradictory tensions and have begun to shift their focus from trade-off (either/or) to paradoxical (both/and) thinking (Bouchikhi, 1998; Earley & Gibson, 2002; Gresov & Drazin, 1997; Koot, Sabelis, & Ybema, 1996; Lewis, 2000; Morgeson & Hoffman, 1999). Further, there is a growing recognition of the role of the processes and systems present in a given context in achieving the desired balance between opposing demands. These processes and systems are important because they provide an alternative way of developing the capacities that architectures or structures are intended to create (Brown & Eisenhardt, 1997; Marks, Mathieu, & Zaccaro, 2001).

Combining these insights, we develop the concept of *contextual ambidexterity*—contextual because it arises from features of its organizational context. Contextual ambidexterity is the behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit. Alignment refers to coherence among all the patterns of activities in the business unit; they are working together toward the same goals. Adaptability refers to the capacity to reconfigure activities in the business unit quickly to meet changing demands in the task environment. By their nature, such capacities are complex, causally ambiguous, widely dispersed, and quite time-consuming to de-

¹ We would like to thank Marshall Schminke, Associate Editor of the *Academy of Management Journal*, for helping us to clarify the distinction between structural ambidexterity and contextual ambidexterity.

velop (Amit & Schoemaker, 1993; Barney, 1991; Prahalad & Hamel, 1990).

The concept of contextual ambidexterity differs markedly from the traditional concept of structural ambidexterity because the former is best achieved *not* through the creation of dual structures, but by building a set of processes or systems that enable and encourage individuals to make their own judgments about how to divide their time between conflicting demands for alignment and adaptability (Duncan, 1976; McDonough & Leifer, 1983; Tushman & O'Reilly, 1996). Further, rigorous systematic evidence documenting the success of ambidextrous organizations is lacking, and there has been very little detailed investigation of how organizations actually achieve ambidexterity (Adler, Goldoftas, & Levine, 1999). Thus, the purpose of this study was to empirically investigate the antecedents and consequences of organizational contextual ambidexterity.

We build on the organization-context literature, in particular Ghoshal and Bartlett's (1994) framework for organizational effectiveness, to suggest that contextual ambidexterity emerges when leaders in a business unit develop a supportive organization context. According to this perspective, superior business-unit performance is not achieved primarily through charismatic leadership, nor through a formal organization structure, nor even through a "strong culture." Rather, it is achieved by building a carefully selected set of systems and processes that collectively define a context that allows the meta-capabilities of alignment and adaptability to simultaneously flourish, and thereby sustain business-unit performance. These relationships are depicted in Figure 1.

In the body of this article, we develop this argument in greater detail. We first elaborate the concept of contextual ambidexterity and establish its value by examining its relationship with performance. Next, we address the contextual antecedents of such ambidexterity. Finally, we propose the manner in which contextual ambidexterity mediates the relationship between context and performance. We tested our hypotheses on an extensive body of data covering 4,195 individuals in 41 business units. In the latter sections of the article, we present and discuss our empirical findings.

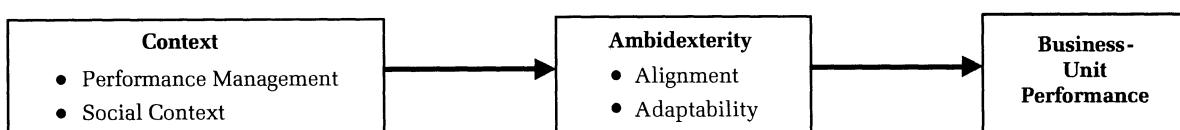
CONTEXTUAL AMBIDEXTERITY IN ORGANIZATIONS

Traditionally, in the organizational literature ambidexterity refers broadly to an organization's ability to pursue two disparate things at the same time—such as manufacturing efficiency *and* flexibility (Adler et al., 1999; Carlsson, 1989), differentiation *and* low-cost strategic positioning (Porter, 1980, 1996), or global integration *and* local responsiveness (Bartlett & Ghoshal, 1989). More specifically, the ambidextrous organization achieves alignment in its current operations while also adapting effectively to changing environmental demands. For example, Tushman and O'Reilly defined ambidexterity as the "ability to simultaneously pursue both incremental and discontinuous innovation and change" (1996: 24); Duncan (1976) focused on the need for organizations to develop dual structural arrangements for managing innovation; and March and Simon (1958) discussed the balance between the conflicting demands for exploitation and exploration.

However, there has been some discussion as to whether internal organizational tensions, such as those between alignment and adaptability, can ever be effectively reconciled (Ford & Ford, 1994; Lewis, 2000). Porter (1996), for example, argued that the trade-off between low-cost and differentiated positions is insurmountable, so that organizations have to make explicit choices. And in research on manufacturing, the trade-off between efficiency and flexibility has been viewed as inherent to the manufacturing process (Carlsson, 1989; Ghemawat & Costa, 1993; Hart, 1942; Klein, 1984). Proponents of this point of view typically have argued that trade-offs are best managed through structural separation—for example, "hiving off" new business development in a separate unit (Drucker, 1985; Galbraith, 1982), or creating autonomous business units (Tushman & O'Reilly, 1996: 25). Such structural separation ensures that each organizational unit is configured to the specific needs of its task environment (Burns & Stalker, 1961; Lawrence & Lorsch, 1967), but it creates coordination costs.

A second perspective on ambidexterity that has appeared in the literature is the idea that organizations can create structures and systems to reconcile

FIGURE 1
Relationships Predicted



seemingly contradictory tensions. For example, in the manufacturing literature flexibility and cost-efficiency are no longer thought of as contradictory (de Meyer, Nakane, Miller, & Ferdows, 1989; MacDuffie, 1995). Achieving both may involve *task partitioning* within a single business unit, whereby, for example, one group adopts an "organic" structure while another takes on a "mechanistic" structure (Adler, Goldoftas, & Levine, 1999; Hedlund & Ridderstrale, 1997; McDonough & Leifer, 1983). Another structural solution put forth is *temporal separation*, a system in which an entire unit focuses on one set of tasks one day, then on a different set of tasks the next (Adler et al., 1999; Duncan, 1976; McDonough & Leifer, 1983). Both these approaches allow the competing demands for adaptability and alignment to be met within a single business unit (which removes many of the coordination costs noted above), but they still rely on structural solutions that require unit managers to judge how best to divide up work groups and/or periods of time to meet those different needs. Thus, to date, scholars have focused on structural ambidexterity, developing structural mechanisms to cope with the competing demands faced by the organization for alignment and adaptability.

In this article, we develop a somewhat different perspective, focusing instead on *contextual ambidexterity*. We concur with previous authors on the idea that ambidexterity is an organization's capacity to simultaneously achieve alignment and adaptability within a single business unit, but we suggest that it is best achieved *not* through structural, task, or temporal separation, but by building a business-unit context that encourages individuals to make their own judgments as to how best divide their time between the conflicting demands for alignment and adaptability. Thus, in other words, contextual ambidexterity can be viewed as a meta-level capacity (for alignment and adaptability) that permeates all functions and levels in a unit, rather than as a "dual structure" (Duncan, 1976) in which the two demands are kept separate. Essentially, contextual ambidexterity is a multidimensional construct, with alignment and adaptability each constituting a separate, but interrelated, nonsubstitutable element. When contextual ambidexterity has been achieved, every individual in a unit can deliver value to existing customers in his or her own functional area, but at the same time every individual is on the lookout for changes in the task environment, and acts accordingly. This is potentially a more sustainable model than structural separation because it facilitates the adaptation of an *entire* business unit, not just the separate units or functions responsible for new business develop-

ment. It also avoids the coordination problems between subunits that were identified above. A further implication is that although ambidexterity is a characteristic of a business unit as a whole, it *manifests itself in the specific actions of individuals throughout the organization*. In their day-to-day work, individuals often face choices as to how they should spend their time—should they continue to focus on an existing customer account to meet quota, or should they nurture a new customer who has a slightly different need? In business units that are aligned or adaptive, individuals are given clear instructions and receive incentives only for those activities that support either alignment or adaptation. But in a contextually ambidextrous unit, the context is dynamic and flexible enough to allow individuals to use their own judgment as to how they divide their time between alignment-oriented and adaptation-oriented activities, and both are valued and rewarded. In short, the systems that are developed at the business-unit level encourage ambidextrous behavior that is both aligned and adaptable.

Although this is the first study to develop the concept of contextual ambidexterity, the logic used here is consistent with that of several earlier studies. Adler and colleagues (1999) referred to two specific mechanisms for reconciling the inherent tension between efficiency and flexibility that rely on individual employees to make their own choices: (1) meta-routines for systematizing the creative process and (2) job enrichment schemes that enable workers to become more innovative and flexible in their routine tasks. Likewise, Hedlund and Ridderstrale (1997) discussed the role of "renaissance company men" in international firms, people who are simultaneously responsible for exploitation- and creation-oriented activities. In both cases, these studies point to the need for a behavioral orientation toward dual capacities, rather than a higher-level separation of those capacities. And more importantly, they also imply that organizations must build systems and processes that facilitate the behaviors.

To summarize, we have defined contextual ambidexterity as an interplay of system capacities—for alignment and adaptability—that simultaneously permeate an entire business unit, and we have noted that our interest lies in understanding both the antecedent conditions that give rise to contextual ambidexterity and the consequences of ambidexterity for business-unit performance. Although there is no lack of research concerned with reconciling internal organization tensions, no prior study has explicitly focused on the measurement,

antecedents, and consequences of organizational contextual ambidexterity as defined here.

Ambidexterity and Performance

When conceptualized in the way described above, ambidexterity is, we argue, all the more conducive to sustainable performance. Alignment activities are geared toward improving performance in the short term. Adaptability activities are geared toward improving performance in the long term. Thus, if a business unit focuses on one of these at the expense of the other, problems and tensions will inevitably arise. Argyris (1993) claimed that such tensions stem from the construction of ambiguous messages that fractionate the organization at the firm level. Suppressing one side of a polarity within a given business unit intensifies pressure from the other (Lewis, 2000). As a result, actors will likely attempt to reduce the frustrations and discomfort of tensions. The actors' defensive behaviors initially produce positive effects, but eventually foster opposite, unintended consequences that intensify the underlying tension, creating what Hofstader (1979) referred to as a "strange loop."

Solutions to this predicament may include acceptance of the dual tensions or confrontation of the tensions, yet several authors have argued that the most powerful approach involves transcendence: the perception of opposites as instead complementary and interwoven (Denison, Hooijberg, & Quinn, 1995; Lewis, 2000; Schneider, 1990). March (1991: 71) made a similar argument in relation to the need for both exploitation and exploration, suggesting that adaptive systems that engage in exploration to the exclusion of exploitation "are likely to find that they suffer the costs of experimentation without gaining many of the benefits," while systems that engage in exploitation to the exclusion of exploration "are likely to find themselves trapped in suboptimal stable equilibria." March suggested that simultaneous development of the two activities is a primary factor in system survival and prosperity.

Under this logic, contextual ambidexterity should be a key driver of business-unit performance over the long term. The only countervailing factor is likely to be the costs of implementing the systems and processes that achieve ambidexterity. At this stage, we do not have sufficient insight into the magnitude of such costs, but from interviews conducted with some of the companies involved in this study we would expect the benefits of ambidexterity to far outweigh the costs. Indeed, there is even a case to be made that developing ambidex-

terity through the means we discuss below is *less expensive* than more traditional structural solutions because the costs of controlling and supervising employees are much reduced. Thus, our first hypothesis is:

Hypothesis 1. The higher the level of ambidexterity in a business unit, the higher the level of performance.

Antecedents of Ambidexterity

This discussion provokes the question: How does a business unit become ambidextrous? Adler and colleagues (1999: 48) pointed to the importance of worker training and trust in relationships with management as key facilitators. Tushman and O'Reilly (1996) identified a decentralized structure, a common culture and vision, and supportive leaders and flexible managers as the key sources of ambidexterity. And Bartlett and Ghoshal (1989) focused on building a shared vision, recruitment and selection, training, and career path management of executives as ways of stimulating a company to be globally integrated and locally responsive at the same time. These elements are all clearly part of the story, but as Adler et al. (1999) observed, studies to date have not generated an overarching theory explaining ambidexterity. As suggested by our conceptualization of ambidexterity, we argue that the capacities of alignment and adaptability develop through the creation of a particular type of organization context at the business-unit level. Broadly defined, *organization context* is the systems, processes, and beliefs that shape individual-level behaviors in an organization (Burgelman, 1983a, 1983b; Denison, 1990; Ghoshal & Bartlett, 1994). Organization context has important similarities to the related concepts of *structural context*, *organization culture*, and *organization climate*. Structural context refers to the establishment of administrative mechanisms that foster certain behaviors in employees, but its emphasis is on relatively tangible systems and processes such as incentive or career management systems, rather than on more intangible attributes such as a system's capability to stretch employees (Bower, 1970; Bower & Doz, 1979; Burgelman, 1983a, 1983b). Organization culture captures the underlying belief systems and values of individuals in an organization, rather than the formal systems and processes leaders put into place (e.g., Denison, 1990; Ouchi, 1981; Pettigrew, 1979; Schein, 1985). As described by Denison, organization culture refers to "the underlying values, beliefs, and principles that serve as a foundation for an organization's management system as

well as the set of management practices and behaviors that exemplify and reinforce those basic principles" (1990: 2). Climate has been described as a presentation of organizational stimuli or environmental characteristics presumed to affect individual behavior and attitudes (Lewin, Lippitt, & White, 1939). Researchers have subsequently distinguished between organizational climate and psychological climate, which consists of individual interpretive perceptions (James & Jones, 1974; Klein & Koslowski, 2000). Importantly, climate researchers have come to view organization climate as an objective higher-level phenomenon. Although individual perceptions of an organization climate may be used to assess it, if these perceptions are homogenous, they can be aggregated to represent climate as a property of an organization (Klein & Koslowski, 2000). Our broad notion of organization context encompasses these elements; it reflects a combination of the structural context, culture, and climate of a business unit and is considered an objective, higher-level attribute of the unit as a whole.

This view coincides with that put forth by Ghoshal and Bartlett (1994: 95), who defined organizational context in terms of four behavior-framing attributes: discipline, stretch, support, and trust. These attributes are created and reinforced by a variety of micro- and macro-level actions taken by managers in a business unit. *Discipline* induces members to voluntarily strive to meet all expectations generated by their explicit or implicit commitments. Establishment of clear standards of performance and behavior, a system of open, candid, and rapid feedback, and consistency in the application of sanctions contribute to the establishment of discipline. *Stretch* is an attribute of context that induces members to voluntarily strive for more, rather than less, ambitious objectives. Establishment of a shared ambition, the development of a collective identity, and the ability to give personal meaning to the way in which individuals contribute to the overall purpose of an organization contribute to the establishment of stretch. *Support* induces members to lend assistance and countenance to others. Mechanisms that allow actors to access the resources available to other actors, freedom of initiative at lower levels, and senior functionaries giving priority to providing guidance and help rather than to exercising authority contribute to the establishment of stretch. Finally, *trust* is an attribute of context that induces members to rely on the commitments of each other. Fairness and equity in a business unit's decision processes, involvement of individuals in decisions and activities affecting them, and staffing positions with people

who possess and are seen to possess required capabilities contribute to the establishment of trust.

Ghoshal and Bartlett (1994) conceptualized these four attributes—discipline, stretch, support, and trust—as interdependent. An organization, they argued, needs to foster discipline and stretch to encourage individuals to push for ambitious goals, but it also needs support and trust to ensure that this happens within a cooperative environment. Organization context, in other words, can be conceptualized in terms of "the yin and yang of continuous self-renewal" (Ghoshal & Bartlett, 1997: 151): a balance between a pair of hard elements (discipline and stretch) and a pair of soft elements (support and trust). Too much emphasis on discipline and stretch creates burnout and disillusionment among employees, but too much emphasis on support and trust creates a "country club" atmosphere in which no work gets done.

Ghoshal and Bartlett (1994) did not argue explicitly that these contextual features will develop the capacity for contextual ambidexterity. Rather, they described discipline, stretch, support, and trust as engendering individual-level behaviors that result in initiative, cooperation, and learning. But according to Ghoshal and Bartlett, individuals take these actions of their own volition. A context does not dictate specific types of action; rather, it creates a supportive environment that inspires an individual to do "whatever it takes" to deliver results. Thus, we extend their framework by arguing that when a supportive organization context is created, individuals engage in both exploitation-oriented actions (geared toward alignment) and exploration-oriented actions (geared toward adaptability), and this results in contextual ambidexterity, which subsequently enhances performance.

Evidence from the qualitative interviews we conducted with members of the business units in our sample (described below) support these ideas. For example, in three of the most highly ambidextrous business units, there was evidence of a context rich in support and trust for many years, which over the last five years had been complemented with a greater focus on discipline and stretch. Until 1990, employees had viewed the company in question as a comfortable and secure place to work, with an informal atmosphere. Over the last decade, a number of changes were brought about, primarily through top-down initiatives around cost reduction and quality, and through greater focus on key strategic objectives and personal commitment to those objectives. One respondent commented that this business unit was run as a "commando-type organization—appraisal and evaluation interviews are run in a pyramidal form and compensation is [now]

geared towards short-term objectives." Most of these changes were instituted through a new executive team that gave people more structure, which led to a focus on new products and new opportunities as a means of delivering on the more ambitious goals. The net result was that the imposition of greater discipline, and more top-down direction, generated greater adaptability, whereas before the unit had been evolving in a relatively aimless fashion.

As a second example, in a business unit of a North American oil and gas firm, the organization context was clearly very balanced, and it worked in an autonomous or bottom-up manner. Their "loose-tight" model ensured that stretch and discipline were built into performance targets. Trust and support emerged in a subtle way. For example, trust emerged through tangible examples of individuals *not* being punished for well-intentioned business failures. Support manifested itself in the use of IT systems to increase knowledge of what was happening in other parts of the business, and various forums and councils for cooperating and sharing best practices. But for the most part, support emerged spontaneously, through the enlightened self-interest of individuals who knew they could not get things done on their own.

In the low-ambidexterity (and poorly performing) business units, in contrast, there was evidence that the organization contexts were weak or incomplete. For example, in several business units there was evidence of inconsistent messages from top management (which undermined trust), and a sense that the business lacked the ambition or focus needed to generate stretch. As one manager said, "There is no overarching vision; each division devises its own vision and objectives." In several other business units, there was evidence of a lack of followthrough when management systems were used, so it was hard to create discipline. For example, there had been a number of new initiatives, which, according to one manager "had lost accountability and steam" within less than a year. Support systems providing training, feedback, and information across the functions could be identified in both of these low-ambidexterity units, but they were insufficient on their own to develop an effective organizational context.

In view of the previous literature and this evidence, we argue that discipline, stretch, support, and trust are interdependent, complementary features of organization context that are nonsubstitutable, and therefore all four must be present in order for a business unit to become ambidextrous, and subsequently, to perform well. In other words, more stretch cannot substitute for a lack of trust.

Likewise, more support cannot substitute for a lack of discipline. Thus, ambidexterity is achieved when all four of the elements characterize a business unit:

Hypothesis 2. The more that a business-unit context is characterized by an interaction of stretch, discipline, support, and trust, the higher the level of ambidexterity.

Mediation Effects

Finally, we argue that contextual ambidexterity *mediates* the relationship between the four attributes of organization context and subsequent business-unit performance. That is, the attributes of context influence performance *through* the development of ambidexterity. When ambidexterity has not been developed (that is, when an organization has not developed the simultaneous capacities for alignment and adaptability), the context characteristics, in and of themselves, may or may not influence performance. The reason for hypothesizing a mediating effect is that contextual ambidexterity is seen as a meta-capability that is developed gradually over time through the interaction of the various features of an organization context. As both Ghoshal and Bartlett (1994) and Adler and coauthors (1999) showed, the development of this sort of capability takes many years. Stated slightly differently, it would be wrong to suggest that a company could simply institute the four attributes of organization context and expect them to deliver superior performance. Rather, the four attributes shape individual and collective behaviors that in turn shape business-unit capacity for contextual ambidexterity, and it is the ambidexterity that leads to superior performance.

A useful analogy to contextual ambidexterity is the market orientation construct in the field of marketing (Deshpande, 1999; Jaworski & Kohli, 1993; Narver & Slater, 1990). Scholars have developed reliable and valid measures of market orientation, and they have shown that market orientation is associated with superior performance. But the process of developing market orientation in a firm is recognized to be complex, time-consuming, and causally ambiguous. Research has identified some of the necessary systems and techniques needed (such as high-quality market intelligence), but these techniques do not have a direct effect on performance; rather, they contribute to the overall market orientation of a firm, which then leads to performance.

The mediating effect of contextual ambidexterity also occurs because the attributes of context them-

selves can create and amplify internal tensions if they do not contribute to the simultaneous capacities for alignment and adaptability that comprise ambidexterity. For example, the more that managers focus on discipline, the less they are seen to be supportive of risk taking and the less trusting is the climate, inhibiting learning (Edmondson, 2001). In a new product development context, Leonard-Barton (1992) found that inconsistencies between core capabilities and innovation demands frequently led to more intense use of extant strengths, resulting in teams repeatedly missing opportunities for creative breakthroughs. Experimentation reduced the risk of testing new frames and practices, but facilitating experimentation required that systems and processes in the organization develop a supportive and trusting context. Hatch and Ehrlich (1993) detailed similar struggles. To fulfill increasing demands for profit, managers sought to protect corporate assets from being squandered, yet implementing security mechanisms contradicted their messages of trust and cooperation. O'Conner (1995) described related behaviors that occurred during the implementation of participative management. Top management called for midlevel managers' involvement, while at the same time setting strict limits on their discretion. Such mixed messages increased the resistance and alienation of the midlevel managers as they questioned their new roles.

A potential strategy for addressing these possible contradictions between discipline and stretch on the one hand, and support and trust on the other, is the development of contextual ambidexterity at the business-unit level. In support of this proposition, Denison and colleagues (1995) found that effective leaders displayed complex behavioral repertoires that simultaneously fostered consistency, stability, and control, as well as passion, courage, and wonder. Finally, Lewis argued that in the end, managing tensions "denotes not compromise between flexibility and control, but awareness of their simultaneity... emphasizing the coexistence of authority and democracy, discipline and empowerment, and formalization and discretion" (2000: 770).

The qualitative interviews with members of business units in our sample corroborated this evidence and argument. One highly ambidextrous business unit was responsible for consulting services in a U.S. software firm. Here the emphasis was on adaptability—the unit's "remarkable ability to turn on a dime." This was achieved, according to respondents, through "hiring very smart people," setting aggressive but not unrealistic targets, and avoiding too much formalization. As one manager

commented, "Moving at this high rate of speed makes it impossible to maintain formal processes. Instead a lot of people are making unilateral decisions." Alignment, in turn, was achieved through clear objectives, goal-setting programs, and incentive systems that supported adaptability. There were several executive forums in which senior managers came together to ensure their strategy was consistent. "Employees in all lines of business have a clear idea of the company's objectives," observed one manager. It was the simultaneous achievement of alignment and adaptability through the development of systems that fostered the stretch, discipline, support, and trust that enabled this business unit to perform.

We also analyzed the interview transcripts from business units that were the least ambidextrous (and the most poorly performing) for clues regarding the mediating effects of ambidexterity. One common theme to emerge was that the business units were suffering from inconsistent management. They had typically embraced popular management practices such as incentive-based pay or goal setting, but only did so for a while before moving on to other initiatives. As a result, even though the ratings for certain contextual attributes were high, they had not been adopted in combination with other attributes, and they were not left in place long enough for the higher-order capacity for ambidexterity to emerge. Other business units had clearly failed to adapt quickly to changing market conditions, and to some extent were living off their successes of ten years earlier. Thus, reflecting the arguments above and evidence from our interviews, our third hypothesis is:

Hypothesis 3. Ambidexterity mediates the relationship between context—as captured by the interaction of discipline, stretch, support and trust—and business-unit performance.

METHODS

Previous studies in this genre have typically either adopted a single-case-study methodology, or they have relied on single informants to answer questions on behalf of an entire organization, but both approaches have obvious limitations. Our approach, in contrast, was to ask a large sample of individuals to rate their business units on both context and ambidexterity, and to then aggregate their responses to create unit-level measures. This procedure was undertaken in 41 business units, each of which had distinct contexts. This sample was sufficient to allow statistical analysis at the business-unit level.

Procedures and Sample

Our procedures consisted of: (1) interviews with top executives in ten multinational firms, (2) interviews in 2–7 business units in each firm, (3) a survey of a stratified random sample of 50–500 employees at four hierarchical levels in each business unit (identified using a random number generator and employee rosters), (4) identifying and understanding each business unit's key context characteristics through qualitative analysis of interview notes and quantitative analysis of survey data, and (5) feedback sessions in each firm. Here, we report primarily on the quantitative data. The total number of survey respondents was 4,195 individuals from 41 business units in the ten multinational firms. Table 1 provides a breakdown of the sample.

Precautions to avoid same-source bias. We collected the data using a comprehensive survey, and all items required seven-point Likert-style responses. The stratified random sample of respondents from four levels of each business unit provided ratings of organization context, ambidexterity, and performance. To mitigate the problem of same-source bias, we used different levels of respondents for the independent variable (organization context) and the dependent variables (ambidexterity and performance). That is, for the independent variables we aggregated only those respondents who identified themselves as line management and nonmanagement. For the dependent variables, we aggregated only those respondents who identified themselves as senior and middle management, because our pilot studies indicated these respondents were the best informed about unit-level outcomes.

Measures

All constructs were measured with multi-item scales. Scores on these measures were means calculated across items. We based our survey items on previous research and on input from an expert panel of academics and pretested them on a small sample of managers to ensure that meanings were clear. Using our final sample, we conducted numerous analyses (described below) to verify that our measures were sound.

Performance. The dependent variable was measured with four items that required the senior and middle management respondents to reflect on performance over the last five years and indicate the degree to which they agreed with the following (for this and for subsequent measures, item factor "loadings" are in brackets): (1) "This business unit is achieving its full potential" [.76], (2) "People at my level are satisfied with the level of business-unit performance" [.84], (3) "This business unit does a good job of satisfying our customers" [.81], and (4) "This business unit gives me the opportunity and encouragement to do the best work I am capable of" [.84]. Principal component analysis demonstrated that all items loaded on a single factor having an eigenvalue of 2.56 and accounting for 65 percent of the variance. Internal reliability was high ($\alpha = .80$).

Ambidexterity. Although we conceptualized ambidexterity as a multidimensional construct comprised of the nonsubstitutable combination of alignment and adaptability (that is, as the multiplicative interaction of the two capacities), we anticipated that post hoc analyses might involve examination of the capacities independently as well as in

TABLE 1
Characteristics of the Sample Firms

Firm	Number of Business Units	Total Respondents	Nonmanagement	Line Management	Middle Management	Senior Management	Industry	Country
1	2	278	123	126	27	2	Electronic equipment	Japan
2	2	298	132	94	59	13	Heavy engineering	USA
3	2	40	6	6	11	17	Banking	Canada
4	2	166	65	58	29	14	Oil and gas	USA
5	5	478	293	119	53	13	Software	USA
6	5	197	0	98	75	24	Industrial products	India
7	7	190	46	61	48	35	Automotive engineering	France
8	7	356	71	171	83	25	Food products	Canada
9	6	2,122	1,443	483	149	47	Industrial conglomerate	South Korea
10	3	71	35	21	15	0	Defense	France
Total	41	4,195	220	1,236	549	190		

combination. Therefore, we began by constructing separate scales for alignment and adaptability. We captured alignment by asking senior and middle managers to indicate the degree to which they agreed with the following: (1) "The management systems in this organization work coherently to support the overall objectives of this organization" [.56], (2) "The management systems in this organization cause us to waste resources on unproductive activities" (reversed) [.85], and (3) "People in this organization often end up working at cross-purposes because our management systems give them conflicting objectives" (reversed) [.85]. All items loaded on a single factor having an eigenvalue of 1.75 and accounting for 58 percent of the variance ($\alpha = .73$). We captured adaptability by asking senior and middle management respondents to indicate the degree to which they agreed with the following: (1) "The management systems in this organization encourage people to challenge outmoded traditions/practices/sacred cows" [.79], (2) "The management systems in this organization are flexible enough to allow us to respond quickly to changes in our markets" [.92], and (3) "The management systems in this organization evolve rapidly in response to shifts in our business priorities" [.90]. All items loaded on a single factor having an eigenvalue of 2.29 and accounting for 76 percent of the variance ($\alpha = .80$). In a third step, we computed the multiplicative interaction between alignment and adaptability, reflecting our argument that these two capacities are nonsubstitutable and interdependent.

Organization context. We measured organization context by developing multi-item scales to represent the dimension of discipline, stretch, support, and trust identified by Ghoshal and Bartlett (1994). However, factor analysis revealed that it was not possible to identify four distinct constructs using these items. Instead, two factors were identified. One of these factors represents a combination of the items developed for discipline and stretch, and so we refer to this as "performance management context." The other factor represents a combination of the items developed for support and trust, so we refer to this factor as "social context" to represent the content of the items in this construct.

Specifically, to capture performance management context, we asked line management and non-management respondents to indicate the extent to which systems encouraged people at their level (1) "to set challenging/aggressive goals" [.76], (2) "issue creative challenges to their people, instead of narrowly defining tasks" [.75], (3) "be more focused on getting their job done well than on getting promoted" [.59], (4) "make a point of stretching

their people" [.65], (5) "reward or punish based on rigorous measurement of business performance against goals" [.84], (6) "hold people accountable for their performance" [.83], and (7) "use their appraisal feedback to improve their performance" [.66]. The seven items loaded on a single factor having an eigenvalue of 3.77 and accounting for 54 percent of the variance ($\alpha = .89$). To capture social context, we asked line management and nonmanagement respondents to indicate the extent to which systems encouraged people at their level to: (1) "devote considerable effort to developing their subordinates" [.69], (2) "give everyone sufficient authority to do their jobs well" [.87], (3) "push decisions down to the lowest appropriate level" [.86], (4) "give ready access to information that others need" [.72], (5) "work hard to develop the capabilities needed to execute our overall strategy/vision" [.63], (6) "base decisions on facts and analysis, not politics" [.76], (7) "treat failure (in a good effort) as a learning opportunity, not something to be ashamed of" [.68], (8) "are willing and able to take prudent risks" [.66], and (9) "set realistic goals" [.57]. The items loaded on a single factor having an eigenvalue of 4.36 and accounting for 55 percent of the variance ($\alpha = .93$). In a third step in constructing the measure, we created an interaction term using the multiplicative interaction of the performance management context variable and the social context variable, reflecting our argument that these should be considered holistically and are nonsubstitutable. This variable constitutes our measure of organizational context.

Control variables. Finally, we entered nine ($n - 1$) dummy variables representing the firms in our sample to control for firm-level effects in order to parcel out differences due to business-unit-level effects.

Aggregation

Each of the variables in our model represents business-unit characteristics, but we utilized individuals as raters of those characteristics. In the parlance of multilevel theory (Klein & Koslowski, 2000: 41), our model consists entirely of "shared unit-level constructs," meaning that we gathered data from individuals to assess unit-level characteristics that we presumed to be shared within a unit and capable of differentiating among units. Conceptually, this makes sense, given that individual employees are most familiar with the extent to which their business unit exhibits certain attributes of an organizational context, as well as ambidexterity and performance. Yet it is critical with such aggregated variables to statistically demonstrate

within-unit agreement and between-units differences (Ancona & Caldwell, 1992: 655; George, 1990: 110; Goodman, Ravlin, & Schminke, 1990; Klein & Koslowski, 2000).

We conducted several analyses to ensure that such agreement and such differences were present. First, we calculated an interrater agreement score (r_{wg} ; James, Demaree, & Wolf, 1993) for each variable. This measure ranges from 0 ("no agreement") to 1 ("complete agreement"). Glick (1985) suggested .60 as the cutoff for acceptable interrater agreement values. Median interrater agreement was .71 for alignment, .76 for adaptability, .90 for performance management, .93 for social context, and .82 for performance, suggesting adequate agreement for aggregation. We also generated intraclass correlation coefficients—ICC(1) and ICC(2)—, using one-way analysis of variance (ANOVA) on the individual-level data, with unit as the independent variable and the scale scores as the dependent variables. Others have also suggested that an indication of convergence within units is an ICC(1) value greater than zero with a corresponding significant ANOVA test statistic (F) (Kenny & LaVoie, 1985). In all cases, the ICC(1) was greater than zero and the F was significant. The ICC(2) values, which are valuable indicators of the reliability of the unit mean, were .92 for alignment, .98 for adaptability, .92 for performance management, .90 for social context, and .92 for performance, indicating that the means for the sets of perceptions for each variable were accurate representations of the true score for the unit (James, 1982; Lord & Novick, 1968).

Validity Checks

We conducted an external validity check for our performance measure. Because objective indicators of business-unit performance were not available for all business units, we conducted the validity check at the firm level. First, we aggregated subjective business-unit performance to the firm level by averaging senior manager's ratings of all business units within a firm. Then we obtained financial performance indicators for each firm relative to its industry group, calculating measures of return on assets (ROA), return on equity (ROE), and shareholder return over a five-year period for each company and then dividing these performance measures by the equivalent figures for a group of peer companies. These relative measures of financial performance were highly correlated with aggregated measures of subjective performance as rated by senior managers ($r = .75$, $p < .05$), lending strong external validity to the subjective performance measure. Further, this analysis provides

confirmation that managers were reflecting on performance over a five-year period, as opposed to focusing on short-term gains.

Finally, discriminant validity (Venkatraman & Grant, 1986) was established through exploratory and confirmatory factor analysis to verify the distinctiveness of our constructs using all items from all of the scales. The exploratory factor analysis clearly replicated the intended three-factor structure (including ambidexterity, context, and performance) to be used in tests of hypotheses. Items loaded on the intended factors, all of which had eigenvalues greater than one, supporting the three-factor model. Further, exploratory factor analysis (with and without rotation) did not reveal a single or general factor that would suggest the presence of common method (Brewer, Campbell, & Crano, 1970) or social desirability variance (Thomas & Kilmann, 1975).

We employed confirmatory factor analysis using LISREL 8 (Jöreskog & Sörbom, 1996) to compare the proposed three-factor model to an alternative five-factor model (including performance management context, social context, alignment, adaptability, performance), and a seven-factor model (including stretch, discipline, support, trust, alignment, adaptability and performance). Absolute fit indexes for the proposed three-factor model ranged from adequate to excellent ($\chi^2 = 909.73$, $df = 274$, $p < .001$, $GFI = .98$, $CFI = .98$, $IFI = .98$, $RMSEA = .04$), and these fit indexes were superior to both the five- and the seven-factor models.² In addition, the value of another comparative index, Akaike's information criterion (AIC; Boomsma, 2000; Hu & Bentler, 1999) was better (that is, smaller) for our three-factor model than for the five- or seven-factor model ($AIC_{3\text{-factor}} = 1,063.79$; $AIC_{5\text{-factor}} = 1,688.93$; $AIC_{7\text{-factor}} = 3,127.54$). All of these results indicate that our three-factor model provided a better fit to the data than did its plausible rival specifications. Further, these results indicate that the three scales represent concepts that are not only theoretically, but also empirically, distinguishable.

² As is typical in the confirmatory factor analysis (Kelloway, 1998), the chi-square associated with our three-factor model was significant. For a discussion of reasons for significant chi-squares apart from real specification errors, see Boomsma (2000). Note, however, that the RMSEA (.04) did not exceed the .08 cutoff value recommended by experts (e.g., Browne & Cudeck, 1993; Hu & Bentler, 1999).

RESULTS

Tests of Hypotheses

Means, standard deviations, and correlations among the variables are shown in Table 2. There was a strong, positive correlation between alignment and adaptability, indicating that business units can indeed achieve both simultaneously. Further, alignment, adaptability, and their interaction (ambidexterity) were significantly and positively correlated with performance, with ambidexterity demonstrating the strongest correlation. This finding indicates the importance of the dual capacity. Performance management context, social context, and their interaction (organizational context) were significantly and positively related to performance. Bearing in mind that the context and performance variables were rated by different respondents, these high correlations are worthy of note. Essentially, they provide evidence that organizational context is related to performance; however, our subsequent analysis (below) investigates the complexity of this relationship as mediated by ambidexterity.

We tested the hypotheses using ordinary least-squares (OLS) regression. Hypothesis 1 predicts that ambidexterity (that is, the multiplicative interaction of alignment and adaptability) will be positively related to performance. As depicted in Table 3, the coefficient for ambidexterity in model 1 was positive and significant ($\beta = .47, p < .01$), supporting Hypothesis 1. Hypothesis 2 predicts that organization context (the multiplicative interaction of the elements of context) would be positively related to ambidexterity. As shown in model 2, this prediction also was supported ($\beta = .68, p < .01$).

Hypothesis 3 predicts that ambidexterity will mediate the relationship between context and performance. Analyzing mediation involves three steps (Baron & Kenny, 1986; Kenny, Kashy, & Bolger, 1998; Mackinnon & Dwyer, 1993). The first step is to establish that the independent variable (here, context) influences the mediator (ambidexterity). This step was supported in model 2 above. The second step is to demonstrate that the independent variable (context) influences the dependent variable (performance). This step was supported in model 3 of Table 3. Context had a significant, positive relationship with performance ($\beta = .58, p < .001$). Lastly, one must demonstrate that the mediator (ambidexterity) influences the dependent variable, with the independent variable (context) controlled. If, in this final step, the effect of context on performance is no longer significant when the mediator is in the model, full mediation is indicated (Baron & Kenny, 1986; Kenny et al., 1998).

As shown in model 4, the coefficient for ambi-

dexterity was positive and significant, indicating a main effect of ambidexterity on performance. Further, with ambidexterity in the equation, the coefficient for context was no longer significant. Both the size of the coefficient for context and the corresponding test statistic for significant difference (t) decreased from model 3 ($\beta = .58, t = 3.28, p < .01$) to model 4 ($\beta = .36, t = 1.81, \text{n.s.}$). We tested the statistical significance of the mediated effect by dividing it by its standard error, thus obtaining a Z-score (Baron & Kenny, 1986; Kenny et al., 1998; Mackinnon & Dwyer, 1993). The mediated effect was statistically significant ($Z = 3.22$), supporting the full mediation proposed in Hypothesis 3 (Baron & Kenny, 1986; James & Brett, 1984; Kenny et al., 1998: 260).³

Post Hoc Analyses

To further verify our findings and gain additional insight, we conducted a series of post hoc analyses. Figure 2 graphically represents the relationship between alignment and adaptability. It highlights a number of important features. The majority of business units cluster toward the middle. We see a small number of business units that rate very high on both alignment and adaptability—the truly ambidextrous businesses. However, there are no business units that rate low on both dimensions. Instead, we see a group of business units low on alignment and average on adaptability, and another group low on adaptability and average on alignment.

This graph suggested the possibility of identifying some meaningful clusters, so we undertook a cluster analysis to facilitate the specification of

³ According to Kenny et al. (1998: 260), "The amount of mediation is defined as the reduction of the effect on the initial variation on the outcome. This *difference in coefficients* can be shown to equal exactly the product of the effect of X on M times the effect of M on Y or ab . Note that the amount of reduction in the effect of X on Y is *not equivalent* to either the change in the variance explained or the change in an inferential statistic such as F or a p value" (emphasis added). If step 2 and step 3 are met, it follows that there necessarily is a reduction in the effect of X on Y. An indirect and approximate test that $ab = 0$ is to test that both a and b are zero (steps 2 and 3). Baron and Kenny (1986) provided a direct test of ab which is a modification of a test originally proposed by Sobel (1982). The standard error of ab can be shown to equal approximately the square root of $(a^2 s_b^2 + b^2 s_a^2 + s_a^2 s_b^2)$, and so under the null hypothesis that ab equals zero, $ab/\sqrt{a^2 s_b^2 + b^2 s_a^2 + s_a^2 s_b^2}$ is approximately distributed as z. Values larger than 1.96 in absolute value are significant at the .05 level.

TABLE 2
Descriptive Statistics and Correlations^a

Variable ^b	Mean	s.d.	1	2	3	4	5	6
1. Organization context	21.72	3.10						
2. Performance management	4.57	0.35	.95**					
3. Social context	4.73	0.36	.95**	.82**				
4. Ambidexterity	16.19	4.42	.55**	.59**	.47**			
5. Alignment	3.96	0.49	.33*	.30*	.33*	.81**		
6. Adaptability	4.04	0.75	.62**	.71**	.50**	.90**	.49**	
7. Performance	3.92	0.54	.59**	.62**	.51**	.78**	.59**	.75**

^a n = 41 (business units).

^b Organizational context is the multiplicative interaction of performance management and social context. Ambidexterity is the multiplicative interaction of alignment and adaptability.

* p < .05

** p < .01

TABLE 3
Results of Regression Analysis

Variable	Model 1: Dependent Variable, Performance	Model 2: Dependent Variable, Ambidexterity	Model 3: Dependent Variable, Performance	Model 4: Dependent Variable, Performance
Firm 1	.11	.26	.29*	.21
Firm 2	-.06	.36*	.19	.07
Firm 3	.03	.26	.24	.16
Firm 4	.06	.60**	.42*	.23
Firm 5	-.04	.71**	.47*	.25
Firm 6	-.21	.33	.03	-.08
Firm 7	-.15	.21	.07	.01
Firm 8	-.42*	.24	-.04	-.11
Firm 9	-.24	.16	-.07	-.18
Ambidexterity	.47**			.32*
Organizational context		.68**	.58**	.36
R ²	.75	.69	.75	.78
Adjusted R ²	.67	.58	.66	.69
ANOVA F	9.08***	6.54***	8.74***	9.18***

* p < .05

** p < .01

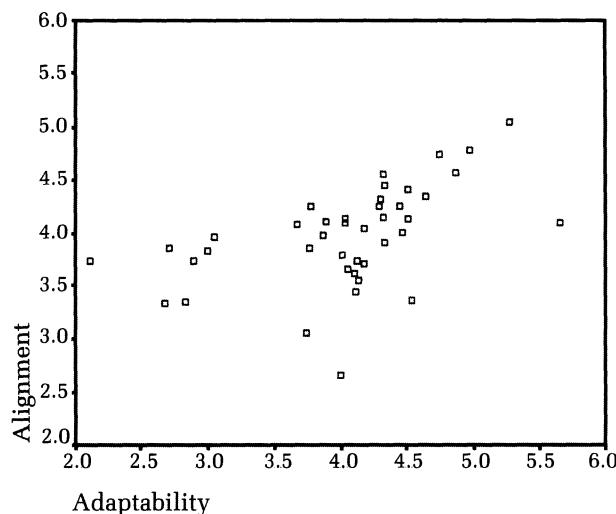
*** p < .001

groups. Under the K-means algorithm (Hartigan, 1975; Hartigan & Wong, 1979), the four-group model provided the best fit. Table 4 shows the alignment and adaptability scores for the four cluster centers. Group 1 consisted of 7 "aligned" business units, with higher ratings on alignment than adaptability. Group 2 consisted of 11 "adaptive" business units, with higher ratings on adaptability than alignment. Group 3 consisted of 18 "moderately ambidextrous" business units, with average ratings on both dimensions. And finally, group 4 consisted of 5 "highly ambidextrous" business units, with high ratings on both dimensions.

The ANOVA F-test was highly significant ($F = 18.11$, $p < .001$) and indicated that we could reject

the null hypothesis that all four groups had the same performance level. Group 4 (highly ambidextrous) was the best performing, followed by group 3 (moderately ambidextrous), group 2 (adaptive), and group 1 (aligned). Using the post hoc S-N-K (Student-Newman-Keuls) procedure, we established that the differences between each and every group were significant. We performed two additional analyses to ensure that this finding was robust. As observed earlier, both ambidexterity and performance were measured by aggregating the responses of the senior respondents in each business unit (senior and middle managers, rather than line managers and nonmanagement employees). This procedure was appropriate, given that the senior

FIGURE 2
Plot of Alignment versus Adaptability for the 41 Business Units



individuals were likely to have a broader perspective on issues of alignment, adaptability, and performance than the lower-level employees. However, this also created a risk of same-source bias in the analysis, so we reanalyzed the data using the senior respondents' ratings of performance and the junior respondents' ratings of alignment and adaptability. This analysis produced similar results, with mean performance levels of 4.13 for group 4 (highly ambidextrous), 4.11 for group 3 (moderately ambidextrous), 3.88 for group 2 (adaptive), and 3.41 for group 1 (aligned). The ANOVA F -test was significant ($F = 5.57, p < .01$). Comparing these results to the previous set shows that the rankings of the four groups on performance are identical.

It is important *not* to overinterpret the meaning of membership of these groups, because there will always be business units on the margin of one group that could easily become members of other groups. This becomes an important issue in the case of group 1 (aligned), which is dominated by business units from a single corporation, and which also ends up being the most poorly performing group. Accordingly, we conducted some sensitivity analysis, which established that changes to the membership of this group did not affect the results in a significant way. We identified the next four business units that were closest to group 1 on the dimensions of alignment and adaptability and added them to group 1 (one of these came from group 2, and three came from group 3). We then reanalyzed the data using this new grouping. Again, similar results emerged, with mean performance levels of 4.60 for group 4 (highly ambidextrous), 4.14 for group 3 (moderately ambidextrous),

3.80 for group 2 (adaptive), and 3.42 for group 1 (aligned). Differences were again statistically significant ($F = 13.59, p < .001$). Post hoc analysis revealed again that all four groups were different from one another. These results provided additional support for our framework. Both ambidextrous groups (groups 3 and 4) outperform those that were only aligned or only adaptive, suggesting that the ability to be ambidextrous is an important predictor of performance.

DISCUSSION

In this study, we adopted a multimethod approach to understanding *contextual ambidexterity* in organizations, in order to investigate several specific hypotheses while also generating new insights into the mechanisms and processes at work in the sample's business units. We found strong evidence that contextual ambidexterity—the simultaneous achievement of capacities for aligned and adaptable behavior—mediates the relationship between features of the organizational context that encourage these behaviors and subsequent performance. This study raises important issues for both theory and practice.

First, there does not seem to be a trade-off between alignment and adaptability, whereby one is sacrificed for the other. Successful business units were able to simultaneously develop these capacities by *aligning themselves around adaptability*. Importantly, the systems that they used to do this were often quite simple—indeed, they often involved less formality, rather than more (O'Toole, 2001). This observation implies a reconceptualization of ambidexterity. Traditionally, research has focused on what we have called *structural ambidexterity*, which involves using structural or architectural solutions to the problem of achieving alignment and adaptability. For instance, certain business units are designated as responsible for adaptability, and others are designated as responsible for alignment; or perhaps temporal separation or task partitioning within a unit serves as a structural means to separately achieve both alignment and adaptability. In this study, we have developed the complementary concept of *contextual ambidexterity*, whereby an organization context encourages individuals to make their own choices as to how they divide their time between alignment- and adaptability-oriented activities. In general, this view supports the recent focus on a paradoxical approach to management, as opposed to an "either/or" focus (Lewis, 2000). Our results indicate that achieving ambidexterity through contextual support is possible and does relate positively to per-

TABLE 4
Results of Post Hoc Cluster Analysis

Group and Firm	Business Unit	Mean Performance Rating	Group Ratings		
			Align- ment	Adapt- ability	Number of Business Units
Group 1					
Aligned					
Firm 6	Furniture products	3.88	3.69	2.75	7
Firm 9	Semiconductors	3.17			
	Dynamic random access memory (DRAM)	2.87			
	Static random access memory (SRAM)	3.36			
	Memory production	3.63			
	Systems	2.82			
	Support	2.80			
Group 2					
Adaptive					
Firm 1	Customer operations	3.58	3.49	4.07	11
Firm 3	Direct banking	4.07			
Firm 4	Energy	3.44			
Firm 5	Consulting vertical services	4.15			
	Marketing	3.89			
	Consulting major accounts	4.00			
Firm 6	Home/office	3.64			
	Storage solutions	3.81			
Firm 8	Food group	3.54			
	Ice cream	4.32			
Group 3					
Moderately ambidextrous					
Firm 1	Office documents	3.56	4.19	4.22	18
Firm 2	Building construction products	4.14			
	Wheel loaders and excavation	4.71			
Firm 3	Mortgages	4.14			
Firm 5	Vertical sales	4.17			
Firm 6	Appliances	3.32			
	Security equipment	3.45			
Firm 7	Engineering	4.30			
	Fabrication	4.69			
	Design	3.88			
	Europe market	4.60			
Firm 8	Food services	4.37			
	Technical manufacturing	3.90			
	Finance	3.57			
	Information services	3.97			
	Consumer demand	4.35			
Firm 10	Projects (DRP)	4.06			
	Commercial	4.33			
Group 4: Highly ambidextrous					
Firm 4	North American	4.80	4.65	5.10	5
Firm 5	Consulting vertical products	3.41			
Firm 7	Commercial France	4.23			
	Utility vehicles	4.81			
	Commercial Europe	4.83			

formance. Further, it is not enough to simply create a supportive context. It is when this supportive context creates the capacity for ambidexterity that performance gains are realized.

In our sample, ambidexterity was an asset across a wide variety of industries, suggesting that it is

likely a critical capability for many, if not all, firms. However, future research might explore whether an important boundary condition to this finding is the level of dynamism in a business environment. In a highly stable or placid business environment, it may be that although a baseline level of adaptabil-

ity is necessary, the business units with the highest levels of alignment are the best performers. Future research investigating an even greater array of industries, varying even more than those in our sample in terms of business environment, would be an important extension of our study.

Second, the qualitative data collected during the research suggests that there are different paths to ambidexterity. The ambidextrous business units in the automotive company in our sample had gradually built adaptability skills on top of their traditional model of alignment, whereas the ambidextrous business unit in the oil and gas company focused on adaptability and created alignment around it, and the business unit in the software firm deliberately created a blend of the two. So there is evidence of "equifinality" (multiple paths) in the process of establishing the systems that result in ambidexterity (Gresov & Drazin, 1997). Depending on the administrative heritage of a given business, and the values of its leaders, equally valid, but slightly different, organization context solutions can be created.

The third conceptual development is the important role played by senior executives in making an organization context effective and developing ambidexterity. Inherent to this research project from its beginning was the argument that as key leaders in organizations, senior executives play a critical role—because they put in place systems that allow supportive contexts to emerge—that in turn shape individual behaviors (Burgelman, 1983b; Ghoshal & Bartlett, 1994). Certainly there is some evidence for this model (for instance, in the oil and gas business units), but there was also strong evidence in several units in both the software and oil and gas firms that senior executives played a more interventionist role, focused on recognizing and promoting new ideas and building energy for those ideas throughout the business. Without this form of intervention, there is a risk that new ideas will fail to get the resources they need to be developed and that strategic coherence will be compromised. Thus, the implication for management practice is that contextual ambidexterity is likely an important and desirable capability that business units can develop, and that it can be shaped at least in part through leaders' behavior. Beyond helping to establish a supportive context, senior executives likely play a role in fostering ambidexterity, primarily by encouraging and nurturing adaptability. In light of our interviews, we would speculate that often this is accomplished by simply serving as a good example, modeling the adaptable behavior, and then reinforcing it with rewards and recognition.

However, it is difficult to be too prescriptive,

because while the Ghoshal and Bartlett (1994) framing suggested a common language around discipline, stretch, support, and trust, the reality in the business units in our sample was that each used its own rather idiosyncratic implementation strategy to create a performance management and social context conducive to the simultaneous achievement of alignment and adaptability. Building on the work of Denison and colleagues (1995) and others, our results suggest the importance of transcending the either/or of performance management and social context to develop simultaneous and complex behavioral responses that foster both alignment and adaptability. A promising extension of our study would be to more systematically examine the behaviors of senior executives in an effort to understand how they help create ambidexterity.

In terms of the methods used in this research, it is worth discussing the pros and cons of using a random sample of individual respondents in multiple business units. While our approach has advantages over either focusing on a single company or using single respondents in multiple business units, the consequence of aggregating a large number of respondents in each business unit was a limited variance in our key constructs. Future research should explore additional means of capturing contextual ambidexterity and context characteristics, perhaps through archival means, or broad-scale interviews, or surveys of customers and/or stakeholders. In addition, future research should explore more objective indicators of business-unit performance, perhaps replicating our validity check at the business-unit level to create a peer group comparison of outcomes for business units. Here, such a comparison was impossible, as these data were not available for many of the business units in non-U.S. firms in our sample, but with a more narrow set of firms, financial indicators might be available for all business units.

In conclusion, we view the concept of contextual ambidexterity as highly promising for understanding the tensions, balances, and equilibrium that leaders must manage in complex organizational environments. Encouraging a supportive organizational context that generates simultaneous capacities for alignment and adaptability may be a key source of competitive advantage for leaders in the 21st century. Future research aimed at further delineation of the underlying features of organizational context that are most critical in developing contextual ambidexterity will likely go a long way to sustaining business-unit performance in the era of dynamic economic environments.

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