Online-Appendix zu

„Practical Implications of the Ambidexterity Concepts“

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Appendix A: Key of the coding system

Code	Meaning
A	Top management team level
B	Organizational design
C	External factors and other moderators
1	Recognize and resolve paradox
2	Develop an ambidexterity-oriented strategy
3	Ambidextrous leaders
4	TMT characteristics and constellations
5	Formal structural mechanisms and personal coordination mechanisms
6	Structural arrangements
7	Contextual arrangements
8	Human Resource practices
9	Resource availability
10	Environmental factors
11	Network factors
12	Absorptive Capacity and Externalization
13	Dynamic Capabilities and Routines

Appendix B: Categorization of the text modules selected from academic literature

Page	Text Module	Explanation	Code
Voss, Sirdeshmukh, & Voss (2008)			
151	High operational slack should result in higher product exploitation using existing operational resources.	Operational slack (generic and absorbed) derives from unused or underutilized operational resources, such as excess production capacity (Bourgeois, 1981; Greve, 2003; Tan & Peng, 2003). Because operational slack is absorbed and generally tied to a specific purpose within an organization, it is relatively difficult to reallocate to alternative uses in the near term. High operational slack leads to risk aversion and reduced product exploration. Organizations will focus on squeezing out smaller but certain returns through well-known processes that rely on existing competencies and resources.	C9
151	Hypothesis supported: The association between operational slack and product exploitation is positive.		
151	as a result of its rare and absorbed nature, human resource slack should contribute […] positively to exploitation.	Human resource slack refers to specialized and skilled human resources that are rare and absorbed (Mishina et al., 2004). The absorbed nature of human resource slack makes it difficult to reallocate in the short term. Shifting human resources within organizations is structurally difficult and may face political hurdles that typically accompany decisions pertaining to skilled personnel (Mishina et al., 2004).	C9
151	Hypothesis supported: The association between human resource slack and product exploitation is positive.		
152	Hypothesis supported: As an environment is perceived as more threatening, the association between financial slack and product exploration becomes more positive.	Because financial slack is a relatively generic, available, and unabsorbed form of slack, we extend prospect theory to propose that the positive effects of financial slack on product exploration and its negative effects on product exploitation are amplified when an environment is seen as threatening (Chattopadhyay et al., 2001). Organizations holding higher levels of financial slack likely perceive greater value in expending rather than protecting slack resources to ensure long-term survival. In the face of threat, organizations possessing sufficient financial slack will view exploitation—a defensive mechanism—as a less desirable option than exploration.	C10
153	Hypothesis supported: As an environment is perceived as more threatening, the association between customer relational slack and product exploration becomes less negative.	The rarity of customer relational slack (rare and unabsorbed) imposes motivational constraints on its allocation to risky product exploration and increases investments in less risky forms of exploitation. As perceptions of threat increase and survival considerations become more salient, organizations should be more willing to place customer relational slack at risk and invest in exploration (Shapira, 1995). Moreover, under threatening conditions, firms holding	C10

		unabsorbed, readily reallocated resources are less likely to invest in product exploitation.	
160	When facing a threatening environment, organizations with higher levels of unabsorbed slack, both generic and rare, invest in higher levels of exploration and lower levels of exploitation, both offensive strategies intended to protect their long-term strategic positions.	Depending on the environment and the nature and levels of slack, organizations may adapt their "mental models" and shift from pursuing long-term aspirations to ensuring near-term survival (Steensma & Corley, 2001).	C9 C10
161	different forms of slack resources exert different and sometimes conflicting influences on product exploration and exploitation.		C9
161	Structural arrangements include decoupling organizational units (Benner & Tushman, 2003) and creating substructures within a single unit (Siggelkow & Levinthal, 2003) to produce desired effects on organizational strategy.	Such arrangements can isolate conflicting processes such as product exploration and exploitation, so that an organization can enhance the extent of one emphasis without disturbing others.	B6
161	Making external threats more salient appears to shift organizations to higher (lower) levels of exploration (exploitation).	Organizations holding financial and customer relational slack are more likely to conserve slack under low threat and increase exploration under high threat. This observation suggests that organizations with large endowments of unabsorbed resources seeking to increase their exploration should more strongly integrate business and artistic units so that market pressures create urgency in artistic endeavors.	C10
161	Smaller organizations may lack sufficient resources to support multiple, loosely coupled subunits.	In such cases, adopting organizational cultures and processes capable of supporting simultaneous, conflicting emphases may be a more feasible alternative (Smith & Tushman, 2005). Gibson and Birkinshaw demonstrated that organizations possessing contextual ambidexterity, defined as "the behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit" (2004: 209) realize higher levels of performance than less adaptive organizations.	C9
161	in dynamic markets that require rapid and frequent adaptation of strategic emphasis, rigid structural arrangements may not be efficient.		C10
Uotila, Maula, Keil, & Zhara (2009)			
222	the relationship between the relative amount of exploration orientation and financial performance is moderated by the research and development (R&D) intensity of the industry in which firms operate.	Organizational environments differ significantly in their degree of technological dynamism (Zahra, 1996). Frequent technological change might make an organization's resources and competences obsolete in a relatively short period of time, forcing the firm to constantly explore new technologies. In environments with	C10

222	Hypothesis supported: Industry technological dynamism positively moderates the relationship between relative exploration orientation and the future financial performance of the firm.	lower technological dynamism, a firm's technology base could be used for a protracted period of time, making it possible to completely focus on exploitation. Thus, for environments characterized by different levels of technological dynamism, a different balance of exploration and exploitation might be optimal to maximize performance.	
223	in environments with a high level of technological dynamism, the combination of increased risk of obsolescence and increased upside potential from successful exploration efforts makes sufficient exploration more important and profitable.	A high level of technological dynamism also increases the risks associated with an overemphasis on exploitation. In industries with high technology dynamism, firms not only have more opportunities, but they also face a greater risk that their core technologies become rapidly obsolete (Sørensen and Stuart, 2000). This constrains a firm's capacity to exploit promising opportunities.	C10
228	Viewing exploration and exploitation as a continuum, and regarding achieving a balance among the two essentially as a trade-off among conflicting goals, would seem particularly relevant when studying situations in which firms are pressured to make trade-offs in resource allocations at the firm level.	Our finding of a curvilinear relationship between the relative amount of exploration and financial performance supports March's (1991) argument that a balance between exploration and exploitation should provide optimal performance levels, and that such a balance involves trade-offs between exploration and exploitation.	C9
228	in environments characterized by low technological dynamism, this balance might be less important.		C10
228	a majority of firms would benefit from increasing their emphasis on exploration, an important activity in entrepreneurial opportunity recognition (Zahra, 2008).	Large companies tend to systematically overemphasize exploitation. Our results provide support for this contention. Specifically, around 80 percent of companies we studied engaged in exploration at levels below the optimum in our sample.	
228	aspiring to achieve an optimal balance between exploration and exploitation is most important in high R&D intensive industries.	in these industries, firms in our sample engaged in suboptimal levels of exploration.	C10
228	managers would need to pay more attention to ensuring a sufficient exploratory orientation in the face of the natural overemphasis on exploitation.		
Tiwana (2008)			
255	It is therefore not only important for such project teams to produce outcomes that are well aligned with the project alliance objectives, but also to successfully adapt to new information that emerges after development work has begun (e.g., by quickly producing	Gibson and Birkinshaw (2004) describe this capacity to be simultaneously aligned and adaptive as ambidexterity.	B6

	alternative designs (Dougherty, 1992)).		
256	Hypothesis supported: Knowledge integration at the project level enhances alliance ambidexterity in innovation-seeking project alliances.		
256	knowledge integration facilitates alignment with alliance objectives through syntheses of the unique insights from the thought worlds of various project participants.	The greater the extent of knowledge integration, the greater the prospect that the perspectives of diverse alliance partners will be cross-fertilized and reflected in the project solution.	
256	Greater knowledge integration is also likely to simultaneously facilitate the recognition and integration of new information about new needs and constraints that arises while development work is in progress.	Knowledge integration therefore facilitates correction of misalignments with changing exogenous environments and stakeholder needs during the development process, thus enhancing alliance ambidexterity.	
256	A defining characteristic of bridging ties is non-redundancy (McEvily and Zaheer, 1999; Regans and Zuckerman, 2001; Uzzi, 1996), i.e., the connected actors are heterogeneous in their backgrounds, experiences, knowledge, and skills.	A bridging tie, defined as a tie that spans a structural hole (Regans et al., 2004). The notion of bridging ties is grounded in structural holes theory that suggests that a tie that connects actors separated by a structural hole enables access to new and novel information, thus serves as a bridge to new opportunities. Thus bridging ties link a focal firm or actor to contacts in economic, professional, and social circles that are otherwise not accessible to it (McEvily and Zaheer, 1999). Strong ties and bridging ties span structural holes.	B6
258	Hypothesis supported: Strong ties are positively related to knowledge integration in innovation-seeking project alliances.	Strong ties among collaborators in an alliance facilitates knowledge integration. Knowledge integration enhances alliance ambidexterity.	B6
258	Hypothesis supported: The effect of strong ties on alliance ambidexterity is fully mediated by knowledge integration.	Strong ties influence alliance ambidexterity because they enhance knowledge integration.	
260	Hypothesis supported: Strong ties complement bridging ties in enhancing knowledge integration in innovation-seeking project alliances.	Strong ties complement bridging ties in facilitating knowledge integration i.e., there exists a positive interaction effect.	B6
260	Hypothesis supported: The influence of the complementarity between strong ties and bridging ties on alliance ambidexterity is fully mediated by knowledge integration.	Complementarities between strong and bridging ties enhance alliance ambidexterity primarily because they enhance knowledge integration. Therefore, The effect of the interaction between strong ties and bridging ties on alliance ambidexterity is fully mediated by knowledge integration.	B6

267	On the one hand, heterogeneous expertise made accessible by bridging ties creates the potential for novel recombinations of knowledge and skills, while on the other, trust, reciprocity, and close interaction must be nurtured to translate them into alliance ambidexterity.	In other words, strong ties help integrate the diverse knowledge and capabilities made accessible by bridging ties.	B6
268	the selection of an appropriate mix of team members to participate in multifirm project alliances.	Such team member selection continues to be a challenge facing contemporary managers (Regans et al., 2004). Although much innovation generation in multifirm strategic alliances occurs at the project level, the majority of prior alliances studies have focused on the alliance as the unit of analysis (Gerwin and Ferris, 2004).	A4
Taylor & Helfat (2009)			
718	without effective linkages between the organizational units in which the necessary assets reside, technological transitions are likely to fail.		A2
718	organizational linkages promote ambidexterity by enabling firms to transition to a new technology while utilizing and adapting valuable preexisting capabilities that can be critical to the success of a transition.	We define organizational linkages as those that connect actors with different job responsibilities in an organization, within or across units, through communication and coordination.	A2
718	top management has an important effect on the activities of middle managers, who are critical to organizational linkages involving core technology and complementary assets required for technological transitions.	A technological transition is a fundamental change in the nature of a product and the core technology that underpins that product.	A2
721	Linking activities involving communication include actions such as making phone calls, writing emails and memos, participating in face-to-face discussions in formal and informal meetings, and transferring records and other documentation.	We define organizational linkages as those that connect actors with different job responsibilities in an organization, within or across units, through communication and coordination.	A2
721	Linking activities involving coordination include organizing and implementing aligned actions among organizational actors such as cross-functional training, joint planning, and decision making, such as for resource allocation and shared or coordinated deployment of resources.		
722	four critical influences that affect the willingness and ability of middle managers to perform organizational linking activities: economic, structural,		A2

	social, and cognitive.		
723	Economic incentives that affect managerial behavior include monetary rewards and salary-increasing promotions.	Economic incentives: salary, bonus, commissions, profit sharing, promotions	B8
724	To connect specialized units with one another, organizations often utilize structures designed to facilitate linking.	Structural influences: degree of centralization, functional units, team formation In their well-known work on organization design, Tushman and Nadler (1978, p. 618) refer explicitly to "structures that exist to link together or coordinate activities of interdependent subunits ... including rules and procedures, planning and control systems, and specific coordinating units such as product teams or task forces" (italics added).	B6
724	Social rewards that prevail in organizational life include group affiliation, emotional support, self-esteem, social status, and salient identity (Benjamin and Podolny 1999).	Social context: status, recognition, visibility, responsibility	B8
725	Organizational cognition consists of shared assumptions and understanding within a firm regarding how information is organized, how knowledge is coded, and the relationships between different types of knowledge (Walsh 1995, DiMaggio 1997).	Organizational cognition: shared assumptions, prior experience, values These shared assumptions and understanding are reflected in organizational values, norms of behavior, and culture.	A1
723	Linking new technology with new and existing complementary assets.	Core technology to complementary assets links	A2
723	Linking new complementary assets to new and existing complementary.	Inter-complementary asset links	
723	Linking new and existing complementary assets of the same type.	Intra-complementary asset links	
736	for technological transitions to succeed, the new core technology and complementary assets must function as an interdependent system.	This requires organizational linkages between units in charge of the new core technology and new as well as old complementary assets, and linkages between and within units in charge of complementary assets.	A2
736	Our study extends this research to incorporate the ability of managers not only to manage established and new business units simultaneously (Earley and Gibson 2002, Gibson and Birkinshaw 2004), but also to manage linkages within and across business units during the replacement of a company's core business with a completely new business.	The literature on ambidexterity highlights that in a dynamic environment, organizations must make tradeoffs between having well-aligned current businesses and having processes to search for and exploit new business opportunities (Duncan 1976, Tushman and O'Reilly 1996).	A2

Smith & Tushman (2005)			
524	Ambidextrous designs are organizational forms that build internally inconsistent architectures and cultures into business units so that the firm can both explore and exploit (Adler et al. 1999).	Where structural differentiation permits firms to explore as well as exploit, the top management team serves as the point of integration between these contrasting agendas. It is the top management team that makes the decisions regarding organizational forms, cultures, and resource allocation processes, such that their firms can both explore and exploit (Hambrick 1994, Romanelli and Tushman 1994). An important function of the senior team is therefore to create meaning in the context of contradiction and to extract the benefits associated with contradictory strategic agendas (Barnard 1968, Weick 1979, Thompson 1967).	B6
524	These organizational architectures involve highly differentiated units as well as top management team integration (He and Wong 2004, Gibson and Birkinshaw 2004, Tushman and O'Reilly 1997).		
524	Top management teams balance short-term performance and long-term adaptability through resource allocation trade-offs and organizational designs decisions (Edmondson et al. 2003, Eisenhardt and Zbaracki 1992, Hambrick 1994).	These strategic decisions require teams to negotiate between the existing product and the innovation, identifying outcomes that will ensure the performance of both agendas.	A1
524	The distributive aspect of a decision involves the division of resources between the existing product and the innovation.	Lax and Sebenius (1986) call this "claiming value," as managers identify resources for each individual product. Teams make a number of decisions in which they might preferentially support either the existing product or the innovation. These decisions are balanced when, over time, they support both products.	A1
525	Decisions can also be defined by their integrative nature—the recognition of opportunities, linkages, and synergies that might arise from the exploitative and exploratory activities.	Lax and Sebenius (1986) call this creating value, in which the negotiated value increases when teams identify creative solutions in which both parties benefit. Top management teams might be able to achieve integrative value in their decisions when they identify ways to benefit from shared resources or to benefit from shared selling in the marketplace.	A1
525	Organizations benefit when structural features of the organization (tasks, skills, formal organization, culture) are internally aligned and are aligned with the firm's strategy (Chandler 1962, Nadler and Tushman 1992).	Yet these internally congruent design features are simultaneously associated with structural and social inertia. These internal inertial dynamics favor existing products at the expense of innovations (Tushman and Romanelli 1985, Leonard-Barton 1992). Further, managers are risk averse in situations of gains, and as such tend to reinvest in the less risky existing products at the expense of more risky innovation (Kahneman and Teversky 1979).	B6
525	when structure, strategies, and competencies all reinforce one another, managers are psychologically more resistant to changing them (Henderson and Clark 1991, Kaplan et al. 2003, Tripsas and Gavetti 2000).		B6

525	exploring and exploiting require fundamentally different and inconsistent organizational architectures and competencies (e.g., Bantel and Jackson 1989, Flynn and Chatman 2001).	However, if individuals privilege consistency over inconsistency, the response to these uncertainties and contradictions is to move toward reducing these inconsistencies and aligning one's own behaviors and cognitions, as well one's multiple activities and social networks, with one another (Lewis 2000, Denison et al. 1995). This effort to preserve consistency stems from a fundamental epistemological belief of a unitary truth (Ford and Backoff 1988, Voorhees 1986). This belief in a unitary truth means inconsistencies cannot fundamentally coexist.	B6
525	Managing these inconsistent architectures requires top management teams that can host these internal inconsistencies (He and Wong 2004, Tushman and O'Reilly 1997).		A1
525	Balancing strategic decisions requires teams to recognize and use these conflicts, rather than try to resolve them.		A1
525	To make balanced strategic decisions, top management teams need to confront and overcome these structural, social psychological, and psychological barriers that create tendencies for both inertia and consistency.	Top management team conditions must be able to support innovation, despite inertial tendencies, and enable the coexistence of inconsistent agendas, despite forces for consistency.	A1
526	Paradoxical cognition—paradoxical frames and cognitive processes of differentiating and integrating—enable balanced strategic decisions.	Paradoxical cognition is the acceptance of the coexistence of contradictory agendas.	A1
527	Recognizing and embracing contradictions leads to increased success.		A1
527	[cognitive/paradoxical] frames create a context that demands the articulation of distinct goals for the existing product and for the innovation.	Creating clear and concise goals motivates the achievement of those goals (Latham and Locke 1995).	
527	By defining distinct goals, managers motivate the success of both the exploitative and the exploratory products.	Paradoxical frames are also associated with reduced threat and fear, which enables positive conflict. A paradoxical frame signals that managers expect both frames to succeed. This opportunistic framing helps shift the threat and competition from between the two products to how these products might benefit one another and the larger firm (Dutton and Jackson 1987).	
527	teams that recognize the dualities and potential synergies of their challenges are associated with less anxiety and stress, and enhanced performance (Murnighan and Conlon 1991, Smith and Berg 1987).		
527	Effectively managing these contradictions is associated with two distinct cognitive processes—differentiating and integrating.	Differentiating helps overcome inertia both by reinforcing the needs of each product and being vigilant that the innovation is not crowded out by commitments to existing strategies and processes. Differentiation in TMTs includes the	B6

527	Whereas differentiating involves recognizing and articulating distinctions, integrating involves shifting levels of analysis to identify potential linkages.	clarification of differences in strategy and organizational architectures. Integrating, in contrast, is associated with sustained attention to possible synergies between the exploitative and exploratory products. Attention to integration helps the team explicitly look for ways that the contradictory strategies can help each other. By addressing different aspects of paradoxical contexts, differentiating and integrating reinforce one another. Integration in TMTs includes the identification of synergies between strategy and organizational architectures.	
529	In some top management teams, integration of strategic contradiction occurs at the leader level.		A1
529	In other top management teams, a group of senior managers, typically the CEO/GM and his or her direct reports, share the responsibility for integrating strategic contradictions (Ancona and Nadler 1989, Bunderson and Sutcliffe 2003).		A1
529	In leadercentric teams, the leader integrates the contradictory agendas.	Team leaders collect information about each agenda, process that information, and make decisions primarily on their own. These leaders recognize the conflicts between the agendas, and they accept and manage those conflicts. These leaders may be able to most successfully embrace paradoxical cognitions and balance strategic decisions with teams that exhibit (1) distinct roles, goals, and rewards; (2) a supportive integrator; (3) extensive leader-member interactions, but limited member-member interactions; and (4) leader coaching to focus on the product level and avoid conflict.	A4
530	Quinn (1984) and Van de Ven et al. (1999) both find that teams that successfully manage paradox involve both the roles of an advocate—one who supports a particular agenda—and the role of an integrator—one who creates connections between the disparate parts.	In leadercentric teams these roles are allocated to distinct team members. The leader is the integrator and the team members are the advocates.	A4
530	leadercentric teams benefit from assigning different individuals to advocate for either the existing product or the innovation.	By separating these roles, team members focus on their distinct task, whether exploring or exploiting, unburdened structurally or psychologically by the contradictions associated with the other (Brown and Eisenhardt 1997, Levinthal and March 1993). Because the task of exploring and exploiting often requires different skills and leadership styles (Leonard-Barton 1992, Sutton 2002, Quinn 1984), separating these roles allows the team leader to assign appropriate team members to these tasks.	

530	In leadercentric teams, the team leader integrates the contradictory agendas.	In successful co-leadership relationships, each of the partners offers different biases and skills to improve the quality of the leader's decisions. By providing another perspective, these supportive integrators help the team leader make balanced decisions.	A4
530	Co-leaders, trusted advisors, or a secondary team member assigned to focus on integration help offset these biases and alleviate some of the leader's cognitive burdens (Eisenhardt et al. 1997).		
531	High-quality interactions enable the team leader to seek and process relevant decision-making information and, in turn, to make more balanced decisions (Eisenhardt et al. 1997).	While interactions between the team leader and team members may lead to high-quality decisions, interactions among team members may be more detrimental in leadercentric teams—particularly interactions between the advocates of the existing product and the innovation. Structurally differentiating responsibility for the existing product and innovation increases interpersonal conflicts, as the product leaders are in competition with one another for scarce resources (e.g., Deutsch 1973, Sherif 1971).	A4
531	Leaders in these leadercentric teams engage more in one-on-one interactions and less in team strategic decision making.	In leadercentric teams, engaging conflict within the team level may be detrimental, as the locus of decision making resides with the leader.	
531	In leadercentric teams, the team leader's coaching provides valuable support that reinforces team processes and team beliefs (Edmondson 1999, Hackman 2002, Wageman 2001).	In leadercentric teams, leaders direct and focus strategy at the team level even as they focus team members at their individual product level.	A4
531	Reinforcing differences between the existing product and the innovation encourages the leaders of each product to focus on their particular strategic agenda.	Reinforcing the necessity of both products and exhibiting coaching behaviors consistent with the contrasting strategic agendas helps differentially motivate the performance of senior team members (Denison et al. 1995).	
531	In teamcentric teams, the teams themselves integrate the contradictory agendas.	Achieving balanced decisions on teamcentric teams is associated with shared mental models of paradoxical frames and collective cognitive processes. Shared paradoxical frames enable team members to build a collective understanding of the team's complex goals and a collective acknowledgment of the tensions and conflicts between their contrasting agendas (Murnighan and Conlon 1991, Smith and Berg 1987). These frames create a foundation for cognitive processes through intensive team interactions. Unlike leadercentric teams, where different individuals assume the roles of advocates and integrators, members of teamcentric teams each assume responsibilities for both of these roles.	A4

531	Effectively embracing both intra- and interpersonal conflict is an important determinant of success for teamcentric teams.	Whereas leadercentric teams manage conflict by attempting to avoid it, conflict abounds on teamcentric teams. Team members may experience intrapersonal conflict in their dual roles of advocates for particular products and as integrators across these products. They may also experience interpersonal conflict with other team members who are competing for scarce resources. Using this conflict to balance contradictions leads to higher quality decisions in teamcentric teams.	A4
531	To build shared mental models and collaborative decision making, teamcentric teams are associated with teams that are designed as real teams (Hackman 2002).		A4
531	teamcentric teams exhibit (1) roles, goals, and rewards at multiple levels of analysis; (2) frequent, high-quality team interactions; and (3) leader coaching to reinforce the organizational level of analysis.		A4
531	A real team creates a foundation for groups of individuals to work together to achieve their collective goals.	Hackman (2002) defines a real team as one with a clear sense of boundaries, an interdependent task, and a clear understanding of the team's authority. A real team allows team members to allocate clear tasks to one another, know who else has information, and work with the other members to create shared mental models and shared processes.	A4
532	having the top management team attend to themselves as a real team helps teamcentric teams deal with strategic contradiction.		
532	teamcentric teams benefit from assigning primary existing product and innovation roles to different team members and aligning these roles with product-level goals and rewards.	Team members with specific product-level responsibilities focus on seeking product-specific information and ideas (Brown and Eisenhardt 1997), even as this information is shared with the entire team (Bazerman and Watkins 2004). These distinct responsibilities are important in overcoming inertia when teams make decisions together.	A4
532	Managers of teamcentric teams are able to embrace this conflict and reinforce integrative thinking by identifying a second set of roles, goals, and rewards at the organizational level—dual roles, superordinate and/or opportunistic goals (Dutton and Jackson 1987, Sherif 1971), and common fate rewards (Tushman et al. 2002).	Assigning product-level roles, goals, and rewards reinforces the conflict and competition between managers of contradictory agendas. This second set of organization-level roles, goals, and rewards helps motivate team members to consider the organization's overarching and integrative strategic agenda. Creating multilevel roles, goals, and rewards helps team members shift from focusing on competition to focusing on individual strategic agendas as well as the firm's overarching strategic agendas (Gilbert 2005).	
532	Weick and Roberts (1993) describe a process of integrating across distinct contributions as heedful interrelating, where team members are aware of their own and others' contributions and	Heedful interrelating involves dynamic learning processes in which team members make contributions to the team and learn from the contributions of others.	A4

	subordinate their own contributions for the team's benefit.		
532	Heedful interrelating depends on team members' ability to interact.	The frequency of their interactions allows for more opportunity to share information with one another. As well, the quality of their interactions ensures that information is actually being shared. As with leadercentric teams, psychological safety on the team (a shared team belief that it is safe to take interpersonal risks) reinforces positive team interactions (Edmondson 1999).	
532	the behaviors of the leader on teamcentric teams reinforce integrative behaviors.	Teamcentric leaders coach their team members to attend to both their products as well as organization-wide issues. In contrast, the behaviors of the leader in leadercentric teams reinforce the focus on differentiating products. In leadercentric teams, the senior leader facilitates his/her team's interaction. These leaders encourage their team members to extend beyond their own product's focus.	A4
532	teamcentric facilitation encourages team members to actively manage conflict rather than allowing it to become an obstacle in team interactions.		
532	Innovation streams in which the development of the existing product and innovation are highly interdependent require increased collaborative interaction between members of the team.	It may be that such tasks require increased team member interaction to attend to the uncertainty associated with such substantial task interdependence (Rivkin and Siggelkow 2003, Nadler and Tushman 1996, Thompson 1967). Teamcentric teams might be more able to deal with substantial interdependence than leadercentric teams. In contrast, under conditions of limited task interdependence, leadercentric teams may have sufficient information-processing capabilities to deal with the more limited coordination requirements.	B7
532	Leadercentric teams are associated with leadership that is much more authoritative, whereas teamcentric teams are associated with more democratic leadership (e.g., Flynn and Chatman 2001, Perlow et al. 2004).	While team leaders may need to express multiple roles and behavioral flexibility in managing contradictory agendas (e.g., Denison et al. 1995), it may be that a leader's preferred leadership style is an important determinant of the differential effectiveness of leadercentric versus teamcentric teams.	A3
Smith & Lewis (2011)			
386	In a dynamic organizational system the role of leadership is to support opposing forces and harness the constant tension between them, enabling the system to not only survive but continuously improve (Nonaka & Toyama, 2002; Teece & Pisano, 1994; Weick & Quinn, 1999).	Dynamic equilibrium assumes constant motion across opposing forces. The system maintains equilibrium by adapting to a continuous pull in opposing directions.	A1
388	By defining what they are trying to do, the leaders define what they are not trying to do, highlighting goals and strategies and creating performing tensions, such as global versus local and socially focused versus financially	Organizations emerge as leaders respond to foundational questions, constructing boundaries that foster distinctions and dichotomies (Ford & Backoff, 1988). In creating organizations, leaders must decide what they are going to do, how they are going to do it, who is going to do	A2

	focused.	it, and in what time horizon.	
388	By defining how they are going to operate, they define how they are not going to operate. Doing so creates organizing tensions, such as loosely coupled versus tightly coupled, centralized versus decentralized, and flexible versus controlling.		
388	Responding to questions about who is going to do what highlights conflicting identities, roles, and values, creating belonging tensions.		
388	as leaders consider the time horizon for their actions, they face learning tensions between today and tomorrow or between looking forward and looking backward.		
392	Actors with cognitive and behavioral complexity and emotional equanimity are more likely to accept paradoxical tensions rather than respond defensively.	Initially managers experienced tensions as a dilemma. However, by recognizing that they could never choose between competing tensions, because either option intensified needs for its opposite, they began to adopt paradoxical thinking and opened discussions to consider both/and possibilities.	A3
392	While cognitive and behavioral complexity and emotional equanimity foster more openness to paradox at the individual level, dynamic capabilities can do so at the organizational level.	Dynamic capabilities refer to the processes, routines, and skills that enable firm leaders to respond effectively to constantly shifting environments (Teece et al., 1997). As such, dynamic capabilities allow leaders to seek and integrate new information through distinct structures (Tushman & O'Reilly, 1996), cultures (Gibson & Birkinshaw, 2004), learning processes (Cohen & Levinthal, 1990; Zollo & Winter, 2002), and managerial capabilities (Adner & Helfat, 2002; Smith & Tushman, 2005).	C13
392	Organizations with dynamic capabilities will foster greater acceptance of paradoxical tensions rather than encourage defensiveness.	Dynamic capabilities provide collective tools to enable organizational leaders to respond to environmental shifts and, in doing so, enable members to be more open and accepting of the dynamic environment of paradoxical tensions.	
392	Acceptance lays the vital groundwork for virtuous cycles.	When actors assume that tensions can and should coexist (Peng & Nisbett, 1999; Rothenberg, 1979), they can mindfully explore the dynamic relationship between tensions (Langer, 1989).	A1
392	viewing decisions as situated in the long term may reduce conflict over scarce resources because managers recognize that any choice is temporary, likely to change in the future because both dualities are vital to propagate	Acceptance can further involve viewing resources as abundant rather than scarce. Those with an abundance orientation assume that resources are adequate (Peach & Dugger, 2006) and that people attend to resources by seeking affirmative possibilities and endless potential	

	long run success.	(Cameron & Lavine, 2006).	
392	Acceptance provides a comfort with tensions that enables more complex and challenging resolution strategies.	Resolution involves seeking responses to paradoxical tensions, either through splitting and choosing between tensions or by finding synergies that accommodate opposing poles.	
393	Smith, Binns, and Tushman (2010) found that more effectively attending to both exploration and exploitation simultaneously involved dynamic decision making in which senior leaders allocated additional resources to both the existing product and the innovation at the same time.	A dynamic strategy may not only reflect inconsistent choices over time but inconsistencies within the same time period.	A1
394	Managing paradoxical tension via dynamic, purposeful, and ongoing strategies of acceptance and resolution (iterating between splitting and integration) fosters sustainability.	By managing organizational paradox, a dynamic equilibrium fosters learning and creativity. Managing paradoxical tensions also helps individuals, groups, and firms to be flexible and resilient, fostering more dynamic decision making. Finally, adopting a dynamic equilibrium approach to organizing can unleash human potential.	A1
396	strategies of acceptance and resolution seek to engage tensions and thereby enable sustainability.	Rather than choose between dualities, paradox theory addresses tensions that are synergistic and persistent.	A1
Simsek, Heavey, Veiga, & Souder (2009)			
867	the temporal nature of ambidexterity captures the distinction between organizational capabilities needed to support the simultaneous pursuit of exploitation and exploration and those required to implement switching between exploitation and exploration at different points in time in a sequential pursuit.		B6 B7
868	refer to the second dimension as structural because it captures whether or not ambidexterity is realized within an independent organizational unit (e.g. a business unit or a small to medium-sized firm (SME)) or within interdependent units (e.g. divisions of a multidivisional corporation or firms engaged in a strategic alliance).	Put differently, when both exploitation and exploration are pursued by the same unit, the pursuit of ambidexterity is viewed as structurally independent. Conversely, when these pursuits involve two or more separate units, ambidexterity is viewed as structurally interdependent.	B6
869	In the absence of partitioning, [the harmonic pursuit of E and E] becomes intertwined in the ongoing operating and strategic activities of the unit in its culture, structure, and systems; placing a premium on its members' integrative abilities.	Harmonic ambidexterity is the simultaneous pursuit of E and E within the same unit (independent). Its theoretical grounding is organizational culture.	B7

881	the creation of a context that promotes a behavioural orientation towards a combined capacity for both exploitation and exploration, one in which they 'simultaneously flourish' (Gibson and Birkinshaw, 2004, p. 209).		
881	Because such a context involves a joint emphasis on high performance (discipline and stretch) and social support (support and trust) (Ghoshal and Bartlett, 1994), it enhances the pursuit of ambidexterity by encouraging individuals to make integrative judgments as to how to best divide their time between the conflicting demands for alignment and adaptability (Gibson and Birkinshaw, 2004, p. 211).		
881	literature has also emphasized organizational practices and routines that promote ambidexterity, such as the use of metaroutines, job enrichment, and task partitioning (Adler et al., 1999).	Within an independent unit these mechanisms provide the flexibility needed to balance exploitation and exploration; for instance, job enrichment programmes provide employees with training and experience in both exploitation and exploration, enabling them to perform and contribute to both sets of activities, whereas meta-routines enable the coordination, synchronization, and integration of exploitive and exploratory activities.	B8 C13
881	Routines that emphasize systematic reflection, conflict regulation, and integration are also useful for harmonizing exploitation and exploration within a single domain (Güttel and Konlechner, 2007).		C13
881	certain organizational systems, such as team-based structures, and human resource practices, especially those that promote creativity, have been shown to support the simultaneous pursuit of exploitation and exploration (Bierly and Daly, 2007).		B8
881	From a managerial perspective, it has been suggested that contextual ambidexterity necessitates leaders with complex behavioural repertoires (Raisch and Birkinshaw, 2008), placing greater emphasis on the portfolio of managerial or leadership roles that a manager can perform (Hooijberg et al., 1997).		A3
884	The roots of partitional ambidexterity can be traced to Duncan (1976), who argued that firms need to innovate in order to insure long-term success and should consider a dual structure, one to	Partitional ambidexterity is the simultaneous pursuit of E and E across subsystems (structurally interdependent). In turn, the concepts of structural partitioning/differentiation and integration have	B6

	initiate and one to execute, as a means to achieve these ends.	their roots in the organizational design literature, which suggests the importance of maintaining a congruence between organizational structure and design and the demands of both the task and the environment (Burns and Stalker, 1961; Duncan, 1976; Lawrence and Lorsch, 1967; McDonough and Leifer, 1983; Nadler and Tushman, 1980).	
884	From this view, pursuing ambidexterity requires the establishment of structurally independent units each having its own strategies, structures, cultures, and incentive systems (Benner and Tushman, 2003).		
884	each unit houses its own distinct management team, organization structure, culture, control systems, and incentive structures (Benner and Tushman, 2003).	Organizational theorists particularly envision partitional ambidexterity as an interdependent, simultaneous phenomenon, involving the compartmentalizing and synchronizing of exploitation and exploration within different structural units or divisions of an organization (e.g. Tushman and O'Reilly, 1996, 1997).	B6
884	while each unit may operate independently, they are organizationally interdependent with respect to the achievement of ambidexterity, thus necessitating the coordination of exploitation and exploration activities essential to achieving simultaneity through the presence of a shared vision and the actions of the senior management team (O'Reilly and Tushman, 2007).		
884	Grounded in social network theory (Brass et al., 2004), this emerging line of research suggests that ambidexterity can be achieved by pursuing exploitation and exploration across network or alliance partners (e.g. Rothaermel and Deeds, 2004), thus relying on market-based mechanisms (or the 'quasi-market') rather than the hierarchy (Williamson, 1975).	Recent research suggests that partitional ambidexterity can be pursued across, as well as within, organizations (Lavie and Rosenkopf, 2006; Lin et al., 2007; Tiwana, 2008).	B6
885	a clear strategic intent that justifies the importance of ambidexterity combined with an overarching strategic vision that provides for a common identity (O'Reilly and Tushman, 2007).		A2
885	As Jansen et al. (2008) explain, they found that management's shared vision 'contributes to a collective understanding of how senior team members might resolve contradictory agendas of exploratory and exploitative units and engage in productive behaviors to develop a collective response to multiple environmental demands' (p. 6).	In a recent study of large European financial services firm, shared vision among senior managers was positively associated with ambidexterity.	A2
885	From a structural perspective, partitional ambidexterity is achieved by creating separate units or divisions for exploitation and exploration (Duncan,		B6

	1976; Tushman and O'Reilly, 1996), with each unit embodying distinct strategic and operating logics, cultures, and incentive systems.		
885	As explained by O'Reilly and Tushman (2007), the ability to simultaneously pursue both exploitation and exploration results from 'hosting multiple contradictory structures, processes, and cultures within the same firm' (p. 24).		A1
885	While tightly coupled and integrated at the business unit level, these logics must remain loosely coupled across business units (Benner and Tushman, 2003).		B7
885	Mechanisms for linking and integrating exploitation and exploration include shared vision (Jansen et al., 2008; O'Reilly and Tushman, 2004, 2007), senior management team coordination (Lubatkin et al., 2006; Smith and Tushman, 2005), and systems for knowledge integration (Tiwana, 2008; Tiwana et al., 2007).	Integration of exploitation and exploration across separate domains is a major challenge for successful attainment of ambidexterity.	B7 A2
885	As Tushman et al. (2004) note, 'the senior team's role is to institutionalize dual architectures and build senior team processes to deal with the conflicts and costs' (p. 7) associated with ambidexterity.	From a managerial perspective, several characteristics of senior management teams serve as important antecedents to this form of ambidexterity.	B7
885	senior management teams must be able to both embrace the paradoxes associated with jointly pursuing exploitation and exploration (Smith and Tushman, 2005) as well as manage the information processing and coordination demands (Lubatkin et al., 2006).		A1
885	Jansen et al. (2008) found that when senior team members shared a vision and received team contingency rewards they were better able to pursue ambidexterity.		A2
885	they also found that 'transformational leaders are necessary to force socially integrated teams to critically debate and openly discuss conflicting task issues' (p. 22).		A3

887	From a managerial standpoint, top managers must be capable of disseminating information across as well as within organizations, thereby facilitating the reciprocal information flows between exploitive and exploratory domains (Mom et al., 2007).		A1
Simsek (2009)			
599	Structural ambidexterity refers to an organizational design or form containing not only separate structural subunits for exploration and exploitation, but also different competencies, systems, incentives, processes, and cultures for each unit (Benner and Tushman, 2003).	For example, upstream units, such as production, are responsible for exploitation, while downstream units, such as marketing and sales, are responsible for exploration.	B6
599	These separate units are held together by a common strategic intent, an overarching set of values, and targeted structural linking mechanisms that enable a productive integration of independent efforts.		
599	Recently discussed by Gibson and Birkinshaw (2004), the behavioural view defines OA as the organization's or business unit's behavioural capacity to simultaneously demonstrate alignment and adaptability across the business unit as the organizational context encourages and supports individuals in their efforts to heed both of these concerns.	Alignment refers to coherence among all patterns of activity, and adaptability to the capacity to reconfigure activities quickly to meet changing demands in the task environment.	B7
602	the behavioural definition proposes building a carefully selected set of systems and processes that collectively define organizational members' behavioural context.	That is, an organizational context may enable individuals to consider both exploitative and explorative aspects of their work; when they try to be effective (doing the right things), they also think about how to be efficient (doing the things right).	
604	OA is achieved when one or more business units in the organization focus on exploiting and one or more on exploring.		B6
604	structural independence ensures that the distinctive processes, structures, and cultures of exploratory units are not overwhelmed by the forces of exploitative culture.	Conversely, established units can simultaneously focus on serving current customers and engaging in exploitation without the distraction and pressures of undertaking exploratory initiatives.	
604	OA is achieved through distinct units 'held together by a common strategic intent, an overarching set of values, and targeted structural linking mechanisms to leverage shared assets'		

	(O'Reilly and Tushman, 2007, p. 22).		
604	OA as a function of a high performance context in which individuals are embedded, a concept borrowed from the strategy process literature (Ghoshal and Bartlett, 1994).	Gibson and Birkinshaw (2004) conceptualize this high performance context on the basis of Ghoshal and Bartlett's (1994) behaviour framing attributes of discipline, stretch, support, and trust. In particular, Gibson and Birkinshaw (2004) group such mechanisms in two interdependent and complementary behaviour-framing attributes: performance management and social support. The former (a combination of stretch and discipline), on the one hand, reflects how an organization induces its employees to voluntarily strive for more ambitious, stretching goals, and outcomes. Social support (a combination of support and trust), on the other hand, reflects the necessity of ensuring that individuals establish ambitious goals within a cooperative work environment, as well as inducing employees to lend assistance and countenance to others and to rely on each other's commitments.	B7
604	rather than adopting a dual structural architecture, managers are expected to create a context that enables and encourages staff members to use their own judgment on dividing their time between exploration and exploitation (Birkinshaw and Gibson, 2004).		
604	The interaction of these meta-constructs (performance management and social support) creates a high performance organizational context that in turn gives rise to OA.		
605	Strategic integration and, as a result, OA, occurs when aspirations are common and when an ambidextrous senior team coalesces (Tushman and O'Reilly, 1996).	Dual structures within the same organization can lead to isolation and the failure of individual units to productively couple their efforts.	A2
605	while organizational members are isolated from the conflicting demands of OA, upper-echelon executives are ultimately expected to drive the organization towards ambidexterity.	Burgelman (2002) describes these complex managerial integration processes and specifically identifies the need for 'strategic debate' – that is, senior leaders who encourage dissenters to argue their points.	A2
605	establishing a high performance behavioural context requires managerial guidance regarding transparency in access to resources, autonomy to take initiatives, and equity and fairness in decision-making processes (Gibson and Birkinshaw, 2004).		B7
605	Smith and Tushman (2005) theorize that establishing paradoxical cognitive frames and processes among senior executives enables the organization to balance strategic contradictions between exploration and exploitation.		A1
605	Lubatkin et al. (2006) synthesized these upper echelons arguments by focusing on the pivotal role of behavioural integration, an all-inclusive TMT process construct that captures the level of the senior team's wholeness and unity of effort.	Because a behaviourally integrated team synchronizes the social and task processes associated with collaborative behaviour, quality of information exchange, and joint decision making (Hambrick, 1995; Simsek et al., 2005), they argued that a behaviourally integrated TMT acts as a forum in which executives openly and freely exchange differing knowledge, resolve conflicts, and create a set of	A4

		shared perceptions, which then can be integrated and acted upon to facilitate OA.	
608	Network centrality has a curvilinear (inverted U-shaped) relationship with OA.	Network centrality generally denotes the extent to which an organization is well connected to others in a network. An actor with high closeness centrality can access other members of the network with the fewest links. High levels of centrality might improve the organization's ability to attain OA but after some point, centrality hinders this ability. Put simply, a moderate level of network centrality is 'optimal', and will have most positive consequences for OA.	C11
609	A dual structural architecture positively moderates the curvilinear relationship between network centrality and OA, such that when an organization has this structure, the apex of the curve will shift to the right and upward, further increasing OA.	When a dual structure exists, the organization is more likely to extract from its network of ties the information and knowledge that OA demands. Small and decentralized exploratory units will help to more effectively extract exploratory information and benefits from network ties, while more centralized, tight cultures and processes of the exploitation units will help to extract exploitative ones. While a moderate level of network centrality is likely to be conducive to OA, this relationship is likely to be strengthened in the context of a dual structure.	C11
611	Diversity of the organization's network of ties is positively related to OA.	The notion of range, the number of different social systems the organization's relationships stems from, captures an organization's network diversity (Powell et al., 1996). For example, an organization that spreads its network connections across multiple industries has higher network diversity than an organization that concentrates its connections within few industries.	C11
609	[Network diversity] provides the organization with the benefit of heterogeneity in its problem-solving arsenal.	Exposure to these different approaches adds to the repertoire that the organization can bring to bear on exploitation and exploration.	
610	diverse network ties are valuable to OA because they can help the organization overcome the familiarity trap, that is, a tendency to favour the familiar over the unfamiliar (Ahuja and Lampert, 2001).	Organizations with greater diversity in their interfirm networks obtain more novel information than those with restricted networks (Burt, 1992; Granovetter, 1973).	
610	diverse ties can also promote OA by enabling organizations overcome the propinquity trap, a tendency to search for solutions that are in the neighbourhood of existing solutions rather than search for completely de novo solutions (Ahuja and Lampert, 2001).	an organization with heterogeneous partners is likely to not only have access to more complementary resources but also to know more about how to productively put these resources into use (Burt, 1992).	

611	A dual structural architecture positively moderates the relationship between network diversity and OA, such that when an organization has this structure, the relationship will be stronger.	Without a dual structure, problems might arise due to the dynamically increasing costs of integrating new information and knowledge that arise from diverse ties. As diversity of ties increases, so do the technological and organizational challenges of integration. Dual structural architectures provide the organization with enhanced capabilities to handle such diversity, thus boosting the organization's ability to identify valuable knowledge, develop connections, and combine information in ways that promote OA.	C11
612	Behavioural context positively moderates the curvilinear relationship between network centrality and OA, such that in a high-performance context, the apex of the curve will shift to the right and upward, further increasing OA.	In a high performance context, the context is dynamic and flexible enough to allow organizational members to pursue both exploitative and exploratory initiatives and activities, both of which are valued and rewarded. Thus, when performance context is high, individuals in the organization focus on pursuing exploitative initiatives, but at the same time also look for explorative opportunities. We might expect that more extensive and efficient informational distribution systems in such a context, suggesting that benefits of network centrality and diversity are likely to be more fully leveraged.	C11
612	Behavioural context positively moderates the relationship between network diversity and OA, such that in a high-performance context, this relationship will be stronger.		
613	The level of TMT behavioural integration positively moderates the curvilinear relationship between network centrality and OA, such that when it is high, the apex of the curve will shift to the right and upward, further increasing OA.	Hambrick (1994) originally proposed the concept of TMT behavioural integration as a metaconstruct intended to capture three key interrelated and reinforcing elements of the TMT process: (1) level of collaborative behaviour; (2) quantity and quality of information exchanged; and (3) emphasis on joint decision making. Lubatkin et al. (2006) argued that behavioural integration directly influences how a TMT deals with the contradictory knowledge processes that underpin the attainment of an exploitative and exploratory orientation, such that greater integration enhances the likelihood of jointly pursuing both. When a TMT is behaviourally integrated, the resultant synchronization of the social and task processes associated with collaborative behaviour, quality of information exchange and joint decision making among senior executives can promote a deeper understanding and utilization of exploratory and exploitative opportunities provided by network centrality and diversity. Behavioural integration will enable the organization to better reconcile and manage the contradictory information and resource benefits associated with centrality and diversity.	C11
614	The level of TMT behavioural integration positively moderates the relationship between network diversity and OA, such that when it is high, this relationship will be stronger.		
616	Environmental complexity positively moderates the curvilinear relationship between network centrality and OA, such that when complexity is high, the apex of the curve will shift to the right	An organization's environment is more complex to the extent that the organization needs to consider heterogeneous actors and a range of activities, linkages, and interactions outside its boundaries in strategic decision making. While	C11

	and upward, further increasing OA.	complex environment demands greater levels of OA, centrality and diversity enhance the organization's ability to develop ambidextrous responses to maintain an appropriate level of fit with the environment (complexity reduction), as well as strategic flexibility such that complexity does not mitigate its ability to develop appropriate actions (i.e. complexity absorption) (Boisot and Child, 1999).	
616	Environmental complexity positively moderates the relationship between network diversity and OA, such that when complexity is high, this relationship will be stronger.		
617	Environmental dynamism positively moderates the relationship between OA and organizational performance, such that when dynamism is high, this relationship will be stronger.	Organizations competing in dynamic environments must be strategically flexible and efficient because customer needs and competitor activities demand immediate action (Sidhu et al., 2004). When the organization successfully pursues OA in a dynamic environment, this should enhance its performance, because while exploration helps encounter rapid obsolescence of products and services, exploitation ensures system efficiency and a steady stream of cash flows (Jansen et al., 2005). Conversely, in stable environments it might be more beneficial for organizations to fully exploit their competitive advantage in either exploitation or exploration.	C10
617	Environmental complexity positively moderates the relationship between OA and organizational performance, such that when complexity is high, this influence will be stronger.	Under conditions of high complexity, a simplistic strategic pursuit that concentrates on 'a single way of conducting business or in one dominant element of strategy' (Miller, 1993, p. 121) may lack the variety needed for effectiveness in the environment. The pursuit of OA can lead to increased performance as environmental complexity increases because OA represents a wider-scope strategy that organizations can use to cope with increased exploitation and exploration demands of complex environments.	C10
Sidhu, Commandeur, & Volberda (2007)			
24	Hypothesis supported: All else being the same, the amounts of nonlocal supply-side, demand-side, and geographic search exhibit a positive relationship with innovativeness.	In view of theory and prior evidence, we would expect greater levels of nonlocal supply, demand, and spatial search in domains external to the organization to be positively related to innovativeness (i.e., ability to introduce successful new products and services). In addition to manifesting itself at the level of the individual search dimensions, the positive relationship should also be observable at the level of the composite three-dimensional construct.	C10
25	Hypothesis supported: Environment dynamism moderates the relationship between the amount of nonlocal supply-side search and innovativeness, such that, all else being the same, the relationship is positive at higher levels and negative at lower levels of dynamism.	More nonlocal supply-side search promotes innovativeness in the earlier stages of technological evolution. Here it can identify fruitful new paths for the searching firm because unexploited opportunities remain to be discovered. At the latter less-dynamic stages of technological evolution this benefit of nonlocal search disappears, with local search gaining in importance due to experience effects derived	C10

		from applying more proximate or familiar knowledge to attain successful incremental modifications and refinements that build on established competences (Dosi 1982, Suárez and Utterback 1995).	
26	Hypothesis supported: Environment dynamism moderates the relation between the amount of nonlocal demand-side search and innovativeness, such that, all else being the same, the relationship is positive at lower levels and negative at higher levels of dynamism.	In less-dynamic environments this should engender innovativeness by improving ability to refine, adjust, or recombine product offerings in ways that enable provision of greater value to customers by meeting their needs better or by being able to satisfy new customer segments. However, in more-dynamic environments, greater demand- side search should be of less value to successful innovation, and may indeed harm it. Typically, at higher dynamism levels uncertainty exists about technological possibilities and the path of further technological evolution, the market is ill defined, and customers do not have well-crystallized needs and preferences.	C10
32	greater spatial search has a positive effect on innovativeness regardless of dynamism levels.	Spatial boundary-spanning search seems to contribute to innovation in more- as well as less-dynamic environments.	C10
33	what matters is not merely the amount of nonlocal versus localized search, but rather the amount of search with reference to a particular search dimension and given the specific context.	In this regard, our findings suggest that, while some firms succeed in identifying the optimal search level for a particular search dimension given the stage of technology, others find it difficult to do so and inappropriately under- or oversearch, arguably due to prior commitments and path dependencies (cf. Levinthal and March 1981, Nelson and Winter 1982).	C10
33	while in fast-changing dynamic contexts firms must manage supply and spatial exploration with demand-side exploitation, when the environment settles down firms need to juggle the balance so that they combine demand and spatial exploration with supply-side exploitation.	Interestingly, recent ambidexterity research suggests that, at any point in time in an industry cycle, equal amounts of exploratory and exploitative search might be advantageous. However, if the value of and returns from different types of exploratory and exploitative search differ as the setting changes, one can no longer simply assume that a supply-side exploration-exploitation balance in the sense of equal proportions of both would be the most appropriate organizational option at all times.	C10
Sheremata (2000)			
405	successful development simply requires structures and processes that do two things; (1) increase the quantity and quality of ideas, knowledge, and information the organization can access and (2) integrate these materials into collective action.	Centrifugal forces in this context are structural elements and processes that increase the quantity and quality of ideas, knowledge, and information an organization can access. Centrifugal forces pull an organization outward, away from its conceptual center. In contrast, centripetal forces are structural elements and processes that integrate dispersed ideas, knowledge, and information into collective action. They pull parts of an organization inward, toward its conceptual center.	B6
390	successful development requires structures and processes that generate and retrieve new ideas, knowledge, and information and then integrate this		

	intellectual material into collective action.		
396	Decentralized problem solving increases the likelihood solutions will be found, increases the quality of solutions, slows the problem- solving process, increases resource expenditures in the problem-solving process, and decreases the quality of tradeoff decisions.	A significant amount of information remains sticky in new product development, meaning it is "costly to acquire, transfer, and use in a new location" (von Hippel, 1994: 429). Therefore, accurate and timely information can often be retrieved only by those located at its source (Quinn, 1980; Van de Ven, 1980b). Similarly, high-quality ideas about how to solve a problem can often be generated only by individuals close to the source of a problem (Diehl & Stroebe, 1991). Therefore, retrieval of accurate and timely information, as well as a large quantity of high quality ideas, appears to require decentralization, defined here as the delegation of authority to solve problems to low levels in an organization's hierarchy (Pugh, Hickson, Hinings, & Turner, 1968).	A5
397	Reach in problem solving increases the likelihood that solutions will be found, increases the quality of solutions, slows the problem- solving process, and increases resource expenditures in the problem-solving process.	Reach is the distance traversed to search for ideas and information. Reach is needed to make non-proximate ideas, knowledge, and information available for problem solving (as is boundary spanning). Extra-organizational reach helps development organizations understand market needs and verify whether a new product meets those needs (Ancona & Caldwell, 1992; Clark & Fujimoto, 1990; Dougherty, 1990). Intra-organizational reach helps organizations find and exploit technological and marketing ideas and information that reside in their parts.	A5
397	The free flow of information in problem solving increases the likelihood that solutions will be found, increases the quality of solutions, speeds the problem-solving process, and increases resource expenditures in the problem-solving process.	Free flow of information is the extent to which large quantities of rich information can be transferred across individuals and organizational boundaries without encountering resistance. Greater free flow therefore directly increases the access an organization has to information and, through that information, ideas. It increases the availability of information and ideas. Social distance (power and status differentials) between organizational levels decreases the flow of information (Hage, Aiken, & Marrett, 1971).	A5
399	Connectedness in problem solving speeds the problem-solving process, increases resource expenditures in the problem-solving process, and increases the quality of tradeoff decisions.	Connectedness is the relational density of a network, which is usually defined as the sum of ties among members of a network (Burt, 1980: 110). It is more narrowly defined here as the extent of direct contact among individuals in problem solving.	A5

400	Project managers who are central in the information network, are perceived to have technical-generalist expertise, who control critical scarce resources, and who have formal position authority speed the problem-solving process, decrease resource expenditures in the problem-solving process, and increase the quality of tradeoff decisions.	Influence is exercised power, where power is the ability to change another's attitudes, beliefs, or behavior in an intended direction (Corfman & Lehman, 1987: 2). Astley and Sachdeva (1984) argued that control over critical scarce resources, centrality in workflows, and formal hierarchical position authority are three additive and structural sources of influence (Emerson, 1962; Pettigrew, 1972; Pfeffer, 1981; Weber, 1947). Expertise appears to be a fourth quasi-structural source of influence (Astley & Sachdeva, 1984: 107; Cialdini, 1988; French & Raven, 1968; Pfeffer, 1981; Weber, 1947). Project managers with these sources of influence motivate others to individual as well as collective action.	A5
400	Cross-functional teams that are central in the information network, have access to needed expertise, control critical scarce resources, and have formal position authority speed the problem-solving process, decrease resource expenditure in the problem-solving process, and increase the quality of tradeoff decisions.	Clark and Wheelwright call a heavyweight team one with "effective leadership, strong problem-solving skills, and the ability to integrate across functions" (1992: 24-25). These teams include representatives from functions who provide function level leadership to the project. The project manager influences these representatives and supervises the work of each function through them.	A5
Rothaermel & Alexandre (2009)			
760	A firm's overall technology sourcing strategy consists of pursuing exploration and exploitation through combining internal and external sources of knowledge.		C12
760	An appropriate level of absorptive capacity allows a firm to overcome inherent tensions in ambidexterity that arise not only from the simultaneous pursuit of exploration and exploitation, but also from internal and external technology sourcing, thus allowing the firm to harness ambidexterity benefits more fully.		C12
762	we consider an organization's ability to effectively reconcile tensions that arise from pursuing exploration and exploitation to be a necessary, but not sufficient, condition for ambidexterity in technology sourcing.	An organization must also address a second source of tension arising from pursuing internal and external technology sourcing simultaneously. Because we predict that balancing internal and external technology sourcing can contribute to enhanced performance, it follows that an excessive focus on either internal or external technology sourcing is likely to lead to inferior performance due to the risks of obsolescence and competence loss (Brown and Eisenhardt 1997, Teece 1986, Teece et al. 1997).	C12

763	Hypothesis supported: An inverted U-shaped relationship exists between a firm's total technology sourcing mix (of known and new technology) and its performance.		
763	Ambidexterity in technology sourcing at the firm level, therefore, implies that managers combine internal and external sources of existing and new knowledge in a simultaneous fashion.	Firms that maintain a balance between internal and external technology sourcing are more likely to attain enhanced performance, because this balance allows firms to leverage their core competencies and to mitigate weaknesses (Nicholls-Nixon and Woo 2003).	
763	a firm's absorptive capacity positively moderates the relationship between its technology sourcing mix and firm performance.	Absorptive capacity is generally developed through continuous funding of and engaging in R&D over time (Cohen and Levinthal 1990), allowing for the identification and exploitation of internal knowledge as emphasized by Rosenberg (1990, p. 171): "it requires a substantial research capability to understand, interpret and to appraise knowledge that has been placed upon the shelf—whether basic or applied. The cost of maintaining this capability [in terms of R&D dollars] is high...".	C12
764	Absorptive capacity, therefore, allows a firm to identify and value new knowledge that originates from beyond its boundaries, and to assimilate and integrate the new knowledge with the firm's existing knowledge (Arora and Gambardella 1994).	Ambidexterity in technology sourcing therefore allows firms to balance the internal and external dimensions of its absorptive capacity. On the flipside, at higher levels of absorptive capacity, ambidexterity in technology sourcing is not only enabled, but also becomes more necessary because of the hypothesized underlying inverted curvilinear relationship between technology sourcing mix and firm performance.	
764	A firm's absorptive capacity, therefore, helps a firm to link external and internal technology sourcing, and thereby to benefit from ambidexterity in technology sourcing.	Knowledge acquisition and assimilation capabilities are built through external technology sourcing, whereas knowledge transformation and exploitation capabilities are created as a by-product of internal technology sourcing.	
765	Hypothesis supported: A firm's absorptive capacity moderates the inverted U-shaped relationship between a firm's total technology sourcing mix (of known and new technology) and firm performance in such a fashion that the positive effect of ambidexterity in technology sourcing on firm performance is stronger when the firm possesses higher levels of absorptive capacity.		C12
774	firms with greater levels of absorptive capacity obtain commensurately greater benefits from ambidexterity in technology sourcing.	This is because greater levels of absorptive capacity allow these firms to not only mitigate the tensions arising from a simultaneous pursuit of exploration and exploitation in a technology strategy that combines internal and external sources, but also to harness the spillovers that are generated when pursuing ambidexterity	C12

		along these two different dimensions.	
774	absorptive capacity allows a firm to balance and reconcile seemingly contradictory tensions arising from the simultaneous pursuit of internal and external technology sourcing of known and new technology.	In short, absorptive capacity is the fulcrum that allows firms to leverage ambidexterity. Not only do the results underscore that the performance enhancing effects of ambidexterity in technology sourcing are stronger in the presence of higher levels of absorptive capacity, they also illustrate that ambidexterity itself becomes more important. Along with higher levels of absorptive capacity, it becomes necessary to strike a balance between the inward- and outward-looking components of absorptive capacity because of the accompanying performance discounts caused by an imbalance (Cohen and Levinthal 1990).	C12
775	managers should create and maintain a complex organizational design that not only enables firms to effectively engage in potentially conflicting activities simultaneously, but also allows them to combine short-term alignment with long-term adaptability (Tushman and O'Reilly 1996, Raisch 2008).	Managers should consider that although ambidexterity in technology sourcing appears to enhance both firm innovative and financial performance, an overly strong reliance on either internal or external technology sourcing can have negative performance implications.	C12
775	It takes an appropriate level of absorptive capacity to proactively harness the benefits derived from ambidexterity in technology sourcing, as spillovers inherent in internal and external technology sourcing synergistically reinforce one another in the presence of higher levels of absorptive capacity.	Although higher levels of absorptive capacity allow managers to take advantage of ambidexterity in technology sourcing, maintaining a balance between internal and external technology becomes a much more important task at higher levels of absorptive capacity because the penalties in terms of performance loss due to an imbalance in technology sourcing strategy are much more pronounced.	C12
776	enhanced firm performance requires a balance between internal and external technology sourcing of known and new technology, yet "the precise mix of exploitation and exploration that is optimal is hard to specify" (Levinthal and March 1993, p. 105).	Achieving and maintaining an internal-external technology sourcing mix matched with a commensurate absorptive capacity to attain enhanced firm performance can be considered a firm level dynamic capability, because it is reflective of a "firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al. 1997, p. 516).	C12
776	Organizational ambidexterity, however, is not simply achieved through organizational structure, but requires a shared vision, a common set of values, and a reward system that enables managers to resolve the paradox of ambidexterity and harness its benefits (O'Reilly and Tushman 2007).	Balancing internal and external technology sourcing along the exploration-exploitation dimensions is a challenging but necessary task for managers (Smith and Tushman 2005), because "maintaining an appropriate balance between exploration and exploitation is a primary factor in system survival and prosperity" (March 1991, p. 71). Ambidexterity in technology sourcing not only requires successful balancing of exploration and	C12

776	the routines, processes, and skills that firms need to have in place are fundamentally different depending on the type of tension emanating from different dimensions of organizational ambidexterity (Raisch 2008).	exploitation, but also successful balancing of internal and external technology sourcing.	
Raisch, Birkinshaw, Probst, & Tushman (2009)			
686	differentiation, that is, the subdivision of tasks into distinct organizational units that tend to develop appropriate contexts for exploitation and exploration.	This structural differentiation helps ambidextrous organizations maintain different competencies with which to address inconsistent demands arising from emerging and mainstream business opportunities (Gilbert 2005). Critics of the differentiation approach, for example, claim that exploitation and exploration have to be recombined to create value (Eisenhardt and Martin 2000, O'Reilly and Tushman 2008, Teece 2007). From this perspective, the mere coexistence of exploitative and explorative activities in differentiated organizational units represents an important yet insufficient condition for organizational ambidexterity (Gilbert 2006).	B6
686	In this approach, the separate organizational units pursuing exploration are smaller, more decentralized, and more flexible than those responsible for exploitation (Benner and Tushman 2003, Christensen 1998, Tushman and O'Reilly 1996).		B6
686	integration, that is, the behavioral mechanisms that enable organizations to address exploitation and exploration activities within the same unit.	Critics of the integration approach argue that integrative contexts are constrained by individuals taking on exploitative and explorative tasks (Bushe and Shani 1991, Inkpen and Tsang 2005, March 1991). They therefore rely on the same basic experiences, values, and capabilities to carry out both tasks, which makes exploring fundamentally different knowledge bases difficult.	B6 B7
686	Gibson and Birkinshaw (2004) describe how organizations design business unit contexts to enable employees to pursue both types of activities.		
686	Lubatkin and colleagues (2006) found that the behavioral integration of top management teams facilitates the processing of disparate demands essential to attaining ambidexterity.		
686	the need for top management teams to ensure integration across differentiated units (Tushman and O'Reilly 1996, Smith and Tushman 2005).		B6
686	ambidextrous organizations should use lower-level integration mechanisms to stimulate the lateral knowledge flow across units (Gilbert 2006, Raisch		B6

	2008).		
686	Adler et al. (1999) suggest complementing integrated contexts with "tactical" differentiation.	They describe how production workers switch between the two tasks supported by "parallel" organizational structures, such as quality circles. These structures enable people from the same unit to move back and forth between a bureaucratic structure for routine tasks and an organic structure for nonroutine tasks.	B6 B7
687	Managing a paradox requires "a creative way that captures both extremes" rather than a simple either/or tradeoff (Eisenhardt 2000, p. 703).	The need to combine processes for differentiation and integration creates a paradox that is difficult to resolve. However, it is still unclear how the tensions between differentiation and integration should be managed. Combining structural differentiation with tactical integration bears the risk of destroying the "pragmatic boundaries" that protect exploratory activities from being affected by the mainstream units' inertial forces (Carlile 2004, Westerman et al. 2006). Combining integration with tactical differentiation requires individuals to work in different "thought worlds" (Dougherty 1992, Kostova and Zaheer 1999), which is often beyond their cognitive limits (Inkpen and Tsang 2005). Therefore, neither solution may allow for maximizing both, exploitation and exploration.	A1
687	When differentiation is combined with integration, exploitation and exploration need to be conceptualized as two ends of a continuum (Gupta et al. 2006).	Thus the managerial task is to determine the right degree of differentiation and integration. It is likely that the right balance between differentiation and integration is dependent on the relative importance of exploitative and exploration activities (Gulati and Puranam 2009). Because the need for exploitation and exploration can vary across initiatives as well as over time, managing the differentiation-integration tensions is likely to be an important dynamic capability for creating and sustaining organizational ambidexterity.	B6
687	integration and differentiation are complementary, not alternative, mechanisms for achieving organizational effectiveness.		B6
687	the relative balance between integration and differentiation is likely to vary with the specific task or activity at hand.		B6
687	the tension between integration and differentiation requires ongoing managerial attention.		B6
687	a business unit may become ambidextrous by creating two functions or subdivisions with different foci (e.g., Benner and Tushman 2003).	In sum, research has suggested that structural mechanisms are used to enable ambidexterity, whereas most individuals are seen as focused on either exploration or exploitation activities. Some studies on structural ambidexterity	B6

687	A manufacturing plant may become ambidextrous by creating two different teams, one in charge of exploration and another in charge of exploitation (e.g., Adler et al. 1999).	acknowledge that a few people at the top need to act ambidextrously by integrating exploitative and explorative activities (e.g., Smith and Tushman 2005). However, the individual dimension of ambidexterity is not explored further.	
687	a single team may become ambidextrous by allocating different roles to each individual (e.g., Jansen et al. 2008).		
687	Ambidextrous managers must manage contradictions and conflicting goals (Smith and Tushman 2005), engage in paradoxical thinking (Gibson and Birkinshaw 2004), and fulfill multiple roles (Floyd and Lane 2000).	Although these studies observe that some managers seem to be able to take on contradictory tasks, they fail to explain why these managers— as opposed to others—are able to do so. Answering this question may require exploring managers' personal characteristics. Individuals with a breadth of prior knowledge categories, as well as various linkages across them, may thus be better prepared to take on both tasks.	A1
687	Mom and colleagues (2007) found that the more a manager acquires top-down and bottom-up knowledge flows, or top-down and horizontal knowledge flows, the higher the levels of exploration and exploitation activities this manager may undertake.		
687	ambidextrous managers have both a short-term and a long-term orientation (e.g., O'Reilly and Tushman 2004, Probst and Raisch 2005).		A3
687	Smith and Tushman (2005), for example, note that the ability to engage in paradoxical thinking may be vital for effectively managing exploitation and exploration.		A1
687	Cohen and Levinthal (1990) argue that individuals need prior related knowledge to assimilate and use new knowledge.		A3
688	Ghoshal and Bartlett (1997) describe socialization, recognition, and team-building practices to help individuals think and act ambidextrously.	Organizational factors affect individuals' ability to act ambidextrously. All these studies provide a strong indication that organizational factors have to be considered alongside personal characteristics when explaining individuals' ambidexterity.	B8
688	Gibson and Birkinshaw (2004) present contexts that allow managers to divide their time between alignment- and adaptability-oriented activities.		B7
688	Lubatkin and colleagues (2006) note that behavioral integration—the senior team's wholeness and unity of effort—can help process disparate demands.		A4
688	Jansen and colleagues (2008) cite formal senior team contingency rewards and informal senior team social integration as important		B8

	mechanisms to enable senior teams to host contradictory forces.		
688	organizational contexts that provide managers with decision-making authority are likely to stimulate richer sense-making and cognitive processes at the personal level.	However, organizational ambidexterity is different from the sum of its members' personal ambidexterity. As described by Tushman and O'Reilly (1996), a relatively small number of ambidextrous managers may be able to integrate exploitative and explorative outcomes generated in different parts of the firm by individuals focused on either exploitation or exploration. Ambidexterity is thus likely to be a function of closely interrelated individual and organizational effects—but in most cases more than the sum of the individual activities.	A5
688	Conversely, individuals' ability to act ambidextrously will have a cumulative effect on the organization's ambidexterity.		B7
688	"sequential ambidexterity" is expected to arise from the dynamic, temporal sequencing of routines for exploitation and exploration (Venkatraman et al. 2007, Puranam et al. 2006).		B6
688	Organizations have to continuously reconfigure their activities to meet changing demands in their internal and external environments (Siggelkow 2002, Webb and Pettigrew 1999).	These studies take a static perspective: organizations become ambidextrous by adopting certain configurations. This conceptualization comes close to traditional contingency theory and the idea of moving systems toward an ideal system state (Ginsberg and Venkatraman 1985, Miller and Friesen 1984). However, modern contingency theory shows that alignment is a dynamic process rather than a question of static configurations (Ketchen et al. 1993, Zajac et al. 2000). It thus appears unlikely that organizational configurations (not even ambidextrous ones) could provide the exhaustive steady-state functionality required to deal with the entire range of boundary conditions that an organization faces over time (Raisch 2008).	C13
688	O'Reilly and Tushman (2008) argue that ambidexterity can only become a dynamic capability if management repeatedly and intentionally orchestrates firm resources.	Dynamic capabilities comprise and integrate both static and dynamic components—the interaction of exploitation and exploration is expected to become a full-blown dynamic capability over time (Schreyögg and Kliesch-Eberl 2007). Managing organizations for the simultaneous pursuit of exploitation and exploration may thus be a task of dynamic rather than static alignment (Siggelkow and Levinthal 2003, Westerman et al. 2006).	C13
688	Siggelkow and Levinthal (2003) recommend temporary decentralization, in which firms use differentiated units for exploration and then reintegrate them.	In terms of structural ambidexterity, it remains unclear how structurally differentiated units evolve over time. Conversely, other scholars describe structurally differentiated units that remain highly autonomous over time.	B6
688	Westerman and colleagues (2006) describe how some differentiated units were transitioned to more integrated designs at later stages of the innovation		

	life cycle.		
689	managing for ambidexterity is a task of dynamic rather than static alignment.		
689	different solutions, including structural and contextual ones, may be required over time to sustain ambidexterity.		
689	ambidexterity may arise from both simultaneous and sequential attention to exploitation and exploration.		
689	One suggestion for resolving the paradoxical requirements of exploitation and exploration has been to externalize one or another set of activities through outsourcing or by establishing alliances (Baden-Fuller and Volberda 1997, Holmqvist 2004, Lavie and Rosenkopf 2006, Rothaermel and Deeds 2004).	Conversely, research on organizational ambidexterity has focused on how organizations address exploitation and exploration internally. Benner and Tushman (2003), for example, conclude that the externalization of exploitation or exploration processes may be harmed by the difficulties in realizing strategic integration across independent firms. On the other hand, research on exploration stresses the importance of the external acquisition of new knowledge. Eisenhardt and Martin (2000) describe the risk of obsolescence when firms source all their knowledge internally. Rosenkopf and Nerkar (2001) found empirical evidence that exploration beyond organizational boundaries had more impact than exploration within organizations. Puranam and Srikanth (2007) describe the organizational challenges faced by acquirers seeking to renew their knowledge bases through the acquisition of innovative firms. The discrete nature of structural integration in acquisitions appears to force a choice between leveraging existing knowledge or the capacity for ongoing innovation by the target firm.	C12
689	externally acquired knowledge may contribute to the reconfiguration of existing knowledge bases.	Kogut and Zander (1992, p. 384) describe "combinative capabilities" as the firm's ability "to synthesize and apply current and acquired knowledge." Similarly, Henderson and Cockburn (1994, p. 66) define "architectural competence" as "the ability to access new knowledge from outside the boundaries of the organization and the ability to integrate knowledge flexibly across boundaries within the organization." Ambidexterity is thus likely to require both internal and external knowledge processes as well as their integration across organizational boundaries.	
689	Researchers have found that inter-organizational activities, such as customer relationships (Im and Rai 2008), corporate venturing (Hill and Birkinshaw 2008), and strategic alliances (Lin et al. 2007, Rothaermel and Deeds 2004), can enable both exploitative and explorative knowledge	To access external knowledge, these studies suggest that organizations need to establish relational contexts characterized by a broad set of resources from other actors and the normative and social cues these actors provide (Adler and Kwon 2002, Nahapiet and Ghoshal 1998). Managers take on brokering roles (Hargadon 2002, Hargadon and Sutton 1997) to span	

	processes.	organizational boundaries and to pull resources together. At the same time, however, externally acquired knowledge has to be absorbed and integrated to realize its potential (Cohen and Levinthal 1990, Kogut and Zander 1992).	
690	Ambidexterity may thus imply the managerial challenge of not only balancing exploitation and exploration but also of integrating external and internal knowledge.	Research on absorptive capacity, for example, argues that although internal knowledge processing and external knowledge acquisition are both necessary, excessive dominance by one or the other will be dysfunctional (Cohen and Levinthal 1990, Zahra and George 2002). Research on organizational boundaries found that activities focused on the creation and reinforcement of boundaries need to be combined with boundary-spanning activities (Ancona and Caldwell 1992, Miller et al. 2007).	
690	Tiwana (2008), for example, found that in the context of alliances, strong ties are required to integrate knowledge, whereas bridging ties are needed to access diverse, novel knowledge.	Not much is known about how ambidextrous organizations take on these challenges. A starting point for future investigations may be research on social networks. Social network theory has shed light on how network characteristics affect knowledge transfer and integration (Hansen 1999, Obstfeld 2005). This work has recently been extended to include the notion of ambidexterity (e.g., Atuahene-Gima and Murray 2007, Lin et al. 2007).	
690	Tiwana (2008) proposes that strong ties complement bridging ties in enhancing ambidexterity.		
690	Tempelaar et al. (2008) found that external social relationships enhance knowledge acquisition, whereas internal social relationships facilitate knowledge diffusion.	They conclude that ambidexterity requires complementary internal and external social relationships. Ambidexterity may thus arise from complex social networks that balance various tensions.	
690	ambidexterity may depend on the firm's ability to integrate internal and external knowledge bases.		
690	the ability to integrate external knowledge relies on a combination of external brokerage and internal absorptive capacity.		
690	ambidexterity may be supported by social networks that contrast internal and external as well as strong and bridging ties.		
690	firms use a mix of integration and differentiation tactics to manage exploitation-exploration paradoxes (Andriopoulos & Lewis, 2009).	Blending both tactics is found to be vital for stimulating the virtuous cycles of ambidexterity. Addressing the individual-organizational tension, the study shows that the paradoxes of innovation occur at different organizational levels. The strategic intent paradox operates at the firm level, whereas the customer orientation paradox affects efforts within projects, and the personal drivers paradox impacts individual	A1 B6
690	firms need to manage innovation paradoxes at multiple levels and the interactions across levels reinforce ambidextrous practices (Andriopoulos		

	& Lewis, 2009).	knowledge workers.	
690	technological innovations sometimes require industry incumbents to shift to a completely new core technology (Taylor & Helfat, 2009).	The authors develop a conceptual framework in which the ability to build and leverage organizational linkages between the new technology and its existing complementary assets is essential for a successful technological transition. In this framework, organization linking mechanisms promote ambidexterity by enabling firms to transition to a new technology while utilizing valuable preexisting capabilities.	C12
690	Ambidextrous management requires firms to explore new knowledge, exploit existing knowledge, and coordinate these knowledge bases (Taylor & Helfat, 2009).	An important contribution to the differentiation-integration tension is the authors' recognition of organizational linkages between new capabilities and the potentially valuable preexisting complementary capabilities.	B6
690	Top management can use economic, structural, social, and cognitive influences to enable middle managers to carry out these linking activities (Taylor & Helfat, 2009).	The article adds to the individual-organizational tension by describing the important role played by middle managers in implementing organizational linkages.	A2
690	ambidexterity emerges from continuous alignment activities throughout the multiple phases of technological change (Taylor & Helfat, 2009).		B6
692	Contributing to the internal-external tension, the findings show that ambidexterity in a firm's technology sourcing strategy not only requires the firm to address the trade-offs that arise from simultaneously pursuing exploration and exploitation but also the trade-offs that arise from combining internal and external technology sourcing (Rothaermel & Alexandre, 2009).	An overly strong reliance on either internal or external sourcing is related to negative performance implications.	C12
692	managers have to actively manage the spillovers from internal and external technology sourcing (Rothaermel & Alexandre, 2009).	The ability to do so depends on the organization's absorptive capacity.	
692	the balance dimension is more beneficial to resource-constrained firms (Cao et al., 2009).	The balance dimension corresponds to a firm's orientation toward a relative balance between exploratory and exploitative activities.	C9
692	the combined dimension is more beneficial to firms with greater access to resources (Cao et al., 2009).	The combined dimension corresponds to the combined magnitude of exploratory and exploitative activities.	
692	Addressing the differentiation-integration tension, the findings show that ambidexterity is fostered by close interrelations between existing and new	A synergistic effect can be achieved by allowing existing resources to be more fully employed to acquire new capabilities and also by permitting new knowledge to be more fully integrated into the existing pool of resources. Thus	B6

	knowledge (Cao et al., 2009).	differentiation approaches need to be combined with integrative efforts to reach ambidexterity's full potential.	
692	structural differentiation can help ambidextrous organizations maintain multiple inconsistent and conflicting demands; however, these differentiated activities need to be mobilized, coordinated, integrated, and applied (Jansen et al., 2009).	In this sense, the authors delineate formal and informal senior team integration mechanisms, and formal and informal organizational integration mechanisms, and examine how they mediate the relationship between structural differentiation and ambidexterity.	A5
692	structural differentiation's previously asserted direct effect on ambidexterity operates through informal senior team and formal organizational integration mechanisms (Jansen et al., 2009).	Integration thus occurs not only at the top management level but also through formal and lateral cross-unit interfaces.	B6
692	At the corporate level, ambidextrous organizations encourage senior team members to socially and informally integrate (Jansen et al., 2009).	Adding to the individual-organizational tension, the findings suggest that integration—which depends on the hierarchical level—occurs through either personal or formal organizational mechanisms.	B6
692	At lower hierarchical levels, ambidexterity is achieved through more formal cross-functional interfaces (Jansen et al., 2009).		
692	a manager's decision-making authority is positively related to ambidexterity (Mom et al., 2009).	Formal structural mechanisms	A5
692	both a manager's participation in cross-functional interfaces and his or her connectedness to other organization members are positively related to ambidexterity (Mom et al., 2009).	Personal coordination mechanisms	
693	Ambidexterity requires active management of the tensions between differentiation and integration.		A1
693	ambidexterity is the outcome of a dynamic process that involves both the simultaneous and subsequent attention to exploitation and exploration.		B6
693	ambidexterity depends on the ability to integrate internal and external knowledge bases for synergistic benefits.		B6 C12
Raisch & Birkinshaw (2008)			
389	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		B6

	adaptability" (p. 211).	
389	semistructures 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).	
389	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).
389	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).
390	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).	
390	At the extreme, Christensen (1998) suggests that exploratory units need to be completely separated from exploitative units to be able to pursue disruptive innovation.	
390	others promote organizational architectures that combine both tight and loose coupling (Bradach, 1997; Tushman & O'Reilly, 1997).	
390	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.	
390	The contrasting units are physically and culturally separated from one another and have different incentive systems and managerial teams.	
390	Strategic integration across units is achieved through coordination at the senior management level and a strong,	

	widely shared corporate culture.		
390	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).	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).	B6
390	A unit's formal primary structure can be used for routine tasks and for maintenance of stability and efficiency.	The supplementary structure coexists with the primary task structure to ensure efficiency and flexibility (Adler et al., 1999).	
390	Additional secondary structures (such as project teams or networks) balance the primary structure's shortcomings and support nonroutine tasks and innovation (Goldstein, 1985).		
391	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.	B7
391	Gibson and Birkinshaw point to earlier recommendations on how to support contextual ambidexterity, including the use of meta-routines and jobenrichment 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).		
391	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.	
391	As key leaders in organizations, senior executives are regarded as playing an important role in fostering ambidexterity.		A3
391	Tushman and O'Reilly (1997) state that ambidexterity is facilitated by the top-management team's internal processes.		
391	Floyd and Lane (2000), for example, relate exploration to the operating levels where managers experiment with novel solutions to emerging problems	Contrary to the studies mentioned above, an emergent group of researchers conceptualizes leadership processes as an independent antecedent of organizational ambidexterity	

	and the subsequent exploitation to the top-management levels where promising solutions are selected and leveraged.	(Lubatkin et al., 2006). Some proponents of this theory relate exploitation and exploration activities to an organization's different hierarchical management levels.	
391	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).	Other scholars suggest that top management may also pursue exploitation and exploration simultaneously.	
391	Smith (2006) describes top-management teams that dynamically shift their resources between the existing products and innovations to support both simultaneously.		
391	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.	A4
392	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.	A4
394	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.	C10
394	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.		

394	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.		
394	Jansen et al. (2005a) who found that firms operating in dynamic competitive environments rely on contextual ambidexterity rather than developing spatially separated units.		
395	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.	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.	C9
395	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).		
395	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.	C9
395	Gibson and Birkinshaw (2004) expect contextual ambidexterity to be more appropriate for small firms or limited to the business-unit level at large firms.		
O'Reilly & Tushman (2008)			
190	The alignment of competencies, systems, structure and culture to execute this strategy is completely different from the alignment needed for exploration, where the key success factors emphasize a longer time perspective, more autonomy, flexibility and risk taking and less formal systems and control.		B6
190	Consistent with Teece's tripartite taxonomy of sensing, seizing, and reconfiguring (Teece, 2006), ambidexterity requires a coherent alignment of competencies, structures and cultures to engage in exploration, a		A2 B6

	contrasting congruent alignment focused on exploitation, and a senior leadership team with the cognitive and behavioral flexibility to establish and nurture both.		
190	Sensing opportunities and threats, particularly in rapidly shifting markets, requires scanning, searching, and exploration.		A2
190	In organizational terms this involves a set of resources and routines such as a strategy-making process associated with variation, resources devoted to competitive intelligence and tracking technological change, and forums for discussions of new opportunities.		
190	More subtly and beyond the requisite resources, this capability also requires a balance in centralization and decentralization of control to encourage feedback from market-facing units, a culture of openness that encourages debate, the commitment of resources by senior leaders (financial and time) to encourage long-term thinking, and a senior management team that fosters a long-term mindset and promotes exploration (e.g., Burgelman, 2002; Edmondson, 1999; Rotemberg & Saloner, 2000).		
190	to promote ambidexterity requires a senior management team that facilitates learning, challenges the status quo, accepts failure, and provides for the integration and transfer of knowledge, even as the exploitive subunit emphasizes the opposite.		
191	Seizing opportunities is about making the right decisions and executing.		A2
191	In organizational terms, this requires leaders who can craft a vision and strategy, ensure the proper organizational alignments (whether it is for exploitation or exploration), assemble complementary assets, and decide on resource allocation and timing.		
191	In more concrete terms, this involves developing a consensus among the senior team about the strategic intent, avoiding the decision traps that path dependencies and mindsets bring, and aligning the business model and		

	strategy.	
191	long-term success inevitably requires that leaders reallocate resources away from mature and declining businesses toward emerging growth opportunities.	A2
191	senior leaders' willingness to commit resources to long-term projects (Danneels, 2002), the ability to design organizational systems, incentives and structures that permit targeted integration across organizational units to capture the advantages of co-specialized assets (Helfat & Peteraf, 2003), and the appropriate staffing of these units (Jansen, 2006; Litz & Klimecki, 2005; Lubatkin et al., 2006).	B6
191	The crucial task here is not the simple organizational structural decision in which the exploratory and exploitative subunits are separated, but the processes by which these units are integrated in a value-enhancing way.	B6
191	reaping the benefits of ambidexterity requires a managerial balancing act in which leaders continually design and realign their businesses with the market.	A2
193	Ambidexterity, in this conceptualization, entails not only separate structural subunits for exploration and exploitation but also different competencies, systems, incentives, processes and cultures—each internally aligned.	B6
193	These separate units are held together by a common strategic intent, an overarching set of values, and targeted structural linking mechanisms to leverage shared assets.	A2
193	These internally inconsistent alignments and the associated strategic tradeoffs are orchestrated by a senior team with a common fate incentive system and team processes capable of managing these inconsistent alignments in a consistent fashion (e.g., O'Reilly & Tushman, 2004; Smith & Tushman, 2005).	A1 B8
193	To explore and exploit at the same time requires that senior management articulate a vision and strategic intent	A2

	that justifies the ambidextrous form (e.g., Rotemberg & Saloner, 2000).		
193	a common set of values and shared meanings that provide a common identity, even though these values may foster different operating norms across the businesses (Podolny et al., 2005; Tushman & O'Reilly, 1997; Voss, Cable, & Voss, 2006).	The operation of two separate organizational alignments with different competencies, incentives, and cultures increases the chances for conflict, disagreement, and poor coordination.	A2
193	a clear consensus within the senior team about the strategy and the importance of ambidexterity.		A2
197	The presence of a compelling strategic intent that justifies the importance of both exploitation and exploration increases the likelihood of ambidexterity.		A2
197	The articulation of a common vision and values that provide for a common identity increase the likelihood of ambidexterity.		
198	A clear consensus among the senior team about the unit's strategy, relentless communication of this strategy, and a common-fate incentive system increases the likelihood of ambidexterity.		
198	Separate aligned organizational architectures (business models, competencies, incentives, metrics, and cultures) for explore and exploit subunits and targeted integration increase the likelihood of successful ambidexterity.		B6
199	Senior leadership that tolerates the contradictions of multiple alignments and is able to resolve the tensions that ensue increases the likelihood of ambidexterity.		A1
202	It requires a leadership team with the skills necessary to provide a compelling vision and strategic intent, a clear consensus and commitment within the team, the skills to manage differentiated sub-units with aligned sub-unit organizational architectures (explore and exploit) with clearly defined interfaces to leverage existing assets, and the ability to resolve the inevitable conflicts that this design entails.		A3

Mom, van den Bosch, & Volberda (2009)			
813	ambidextrous managers host contradictions (Smith and Tushman 2005, Tushman and O'Reilly 1996).	They have the motivation and ability to be sensitive to, to understand, and to pursue a range of seemingly conflicting opportunities, needs, and goals (O'Reilly and Tushman 2004). Related to this, previous research points out the need for ambidextrous managers to deal with conflict (Duncan 1976, Floyd and Lane 2000) and to engage in paradoxical thinking (Gibson and Birkinshaw 2004, Smith and Tushman 2005). Ambidextrous managers search for new market needs and technological opportunities while also being sensitive to reinforce existing product-market positions (Burgelman 2002, Tushman and O'Reilly 1996); they both elaborate on existing goals, beliefs, and decisions and reconsider these (cf. Ghemawat and Ricart I Costa 1993, Rivkin and Siggelkow 2003); and they have both a short-term and a long-term orientation towards identifying and pursuing opportunities (O'Reilly and Tushman 2004).	A3
813	ambidextrous managers are multitaskers; i.e., they fulfill multiple roles and conduct multiple different tasks within a certain period of time (Birkinshaw and Gibson 2004, p. 45; Floyd and Lane 2000).	Ambidextrous managers are more generalists rather than more specialists (Birkinshaw and Gibson 2004, Leana and Barry 2000). Ambidextrous managers fulfill multiple roles related to both competence deployment and competence definition activities (Floyd and Lane 2000, Sanchez et al. 1996), conduct both routine and nonroutine activities (Adler et al. 1999), carry out both creative and collective actions (Sheremata 2000), and typically act outside the narrow confines of their own job (Adler et al. 1999, Gibson and Birkinshaw 2004).	
813	ambidextrous managers both refine and renew their knowledge, skills, and expertise (Floyd and Lane 2000, Hansen et al. 2001, Sheremata 2000).	Importance for ambidextrous managers to acquire and process different kinds of knowledge and information (Floyd and Lane 2000, Sheremata 2000). ambidextrous managers engage in both reliability-enhancing and variety-increasing learning activities (Holmqvist 2004, McGrath 2001), process and acquire both explicit and tacit knowledge (Lubatkin et al. 2006, Nonaka and Konno 1998), and engage in both local and distant search for knowledge and information within their network of contacts (Hansen et al. 2001, Subramaniam and Youndt 2005).	
814	Hypothesis supported: A manager's decision-making authority will be positively related to this manager's ambidexterity		A5

814	increased decision-making authority increases managers' self control and ownership of tasks and decisions (Hage and Aiken 1967, Tushman and O'Reilly 1996), which enables them to act upon the recognized diversity of opportunities and needs and to actively pursue a range of diverse goals (O'Reilly and Tushman 2004, p. 81), i.e., to act ambidextrously.	A manager's decision-making authority is about the extent to which a manager has decision-making authority over how and which tasks the manager performs and his or her ability to solve problems and to set goals (Atuahene- Gima 2003, Dewar et al. 1980). Increasing managers' decision-making authority increases their sense of responsibility for how they conduct their tasks and the performance of these tasks (Tushman and O'Reilly 1996, Zmud 1982). This stimulates their willingness to become aware and recognize a larger diversity of organizational, market, and technological opportunities and needs and to become more sensitive to understanding how to act upon these different opportunities and needs (Miller 1987, Pierce and Delbecq 1977, Tushman and O'Reilly 1996).	A5
814	As Gibson and Birkinshaw (2004, p. 211) put it, increased self control and ownership augments managers' ability "to make their own choices as to how they divide their time between alignment- and adaptability-oriented activities," and it increases their aspiration to attain to both efficiency and flexibility related goals (Adler et al. 1999).		
814	due to increased decision-making authority, managers have to rely more on their own skills and expertise rather than on rules or the skills and expertise of superiors (Hage and Aiken 1967).	This increases these managers' motivation to refine their existing skills and expertise as well as to develop new skills and expertise (Crossan and Berdrow 2003, McGrath 2001, Floyd and Lane 2000).	
814	Increasing formalization of managers' tasks increases the possibility that these managers become less receptive to decision-making stimuli that are not monitored by formal systems (Cyert and March 1963).	Formalization of a manager's tasks refers to the degree to which rules and codes describe a particular task; provide guides for decision making; and provide guides for conveying decisions, instructions, and information and the degree to which the manager has to conform to the task description (Hage 1965, Pugh et al. 1963).	A5
815	Hypothesis not supported: Formalization of a manager's tasks will be negatively related to this manager's ambidexterity.		A5
815	Hypothesis supported: Participation in cross-functional interfaces by a manager will be positively related to this manager's ambidexterity.		A5
815	Participation of managers in cross-functional interfaces increases their cooperation with other managers of different functions, units, and hierarchical levels (Galbraith 1973, Miller 1987).	Cross-functional interfaces encompass lateral integration mechanisms such as liaison personnel, task forces, and teams (Galbraith 1973, Gupta and Govindarajan 2000).	A5
815	managers who participate in cross-functional interfaces also have to think and act outside the narrow confines of their own job and position; i.e., they have to understand and take into consideration the interests,		

	perspectives, beliefs, and values of other managers (Duncan 1976, Floyd and Lane 2000, Miller 1987).		
815	cross-functional interfaces increase trust between managers of differentiated units (Adler et al. 1999, Galbraith 1973), which is "a critical contextual factor" for managers to "shift the tradeoff between efficiency and flexibility" (Adler et al. 1999, p. 63).	It creates a supportive context for managers with different backgrounds to cooperate and learn from each other (Gibson and Birkinshaw 2004).	
815	Duncan (1976) points out that participation in cross-functional interfaces enables managers' ambidextrous behavior by allowing them to confront and resolve conflicts regarding different goals, needs, and interests between differentiated organizational units and hierarchical levels.		
815	Managers' participation in cross-functional interfaces also positively relates to their ambidexterity by offering opportunities to exchange knowledge (Egelhoff 1991, Gupta and Govindarajan 2000).		
815	Cross-functional interfaces offer opportunities for managers to refine their existing knowledge by acquiring knowledge that is related to their own knowledge base.	These interfaces serve, for instance, as mechanisms to exchange knowledge and information regarding best practices of related technologies, processes, or markets, allowing managers to increase or refine their skills and expertise in a limited or specialized area (Henderson and Cockburn 1994, Jansen et al. 2005).	
815	by participating in cross-functional interfaces, managers renew their knowledge base by acquiring new or unrelated knowledge from managers with different expertise (Egelhoff 1991, Ghoshal and Bartlett 1988).		
816	Hypothesis not supported: There will be an inverted U-shaped relationship between connectedness of a manager to other organization members and this manager's ambidexterity.		A5

816	An increasing size of a manager's network of direct contacts across hierarchical levels and organizational units is associated with increasing possibilities for that manager to identify and acquire knowledge for both exploration and exploitation purposes (Hansen et al. 2001, p. 26; Nahapiet and Ghoshal 1998, p. 248; Subramaniam and Youndt 2005).	Connectedness of a manager relates to the extent to which the manager is networked to other organization members across hierarchical levels and organizational units in terms of direct personal contacts (Jaworski and Kohli 1993, Sheremata 2000). It refers to the size of the manager's network of direct contacts across hierarchical levels and organizational units and to the pattern of the manager's network in terms of density (Jansen et al. 2006, Jaworski and Kohli 1993, Sheremata 2000).A manager may benefit from using network contacts by acquiring new and diverse knowledge to, for instance, develop new competences (Floyd and Lane 2000), pursue radical innovations (Subramaniam and Youndt 2005), or find innovative solutions to problems (Sheremata 2000). A manager may also benefit from using network contacts by obtaining related and complementary knowledge to, for instance, improve and refine existing competences (Floyd and Lane 2000), pursue incremental innovations (Subramaniam and Youndt 2005), or reinforce existing beliefs and decisions (Rivkin and Siggelkow 2003).	A5
816	Increasing levels of density of direct personal contacts within a manager's network is associated with an increased ability by that manager to acquire and understand complex and ambiguous knowledge from the network contacts (Hansen et al. 2001) and to engage in reciprocal, nonroutine information processing (Daft and Lengel 1986, Egelhoff 1991).	However, beyond a moderate level, increasing levels of a manager's connectedness may have dampening effects on that manager's ambidexterity. Increasingly dense networks diffuse strong norms, establish shared behavioral expectations, and create a dominant logic (Bettis and Wong 2003, Miller 1993, Rowley et al. 2000). Hansen et al. (2001), for instance, show that maintaining a densely connected network is associated with reduced speed and efficiency in completing both explorative and exploitative projects.	
816	increasing levels of density within a network increases trust and cooperation and decreases the likelihood of goal conflict within the network (Adler and Kwon 2002, Rowley et al. 2000), which benefits the exploitation of new knowledge and the implementation of innovations (Jansen et al. 2005, Sheremata 2000).		
817	Hypothesis supported: There will be positive interaction effects between a manager's decision-making authority and participation in cross-functional interfaces by the manager, on this manager's ambidexterity.		A5
816	Participation in cross-functional interfaces increases managers' opportunities and ability to reduce such uncertainty and equivocality (Daft and Lengel 1986, Miller 1987), for instance, by promoting thorough and multifaceted assessments of problems,	Increasing decision-making authority of managers positively relates to their ambidexterity by increasing their freedom and ability to actively pursue a range of diverse goals (Gibson and Birkinshaw 2004, O'Reilly and Tushman 2004). However, increasing freedom to actively pursue a range of diverse	A5

	proposals, and projects; by exchanging information, opinions, and judgments with experts; by eliciting factual arguments from managers who have to defend their proposals before peers; and by offering opportunities for consultation (Daft and Lengel 1986, Egelhoff 1991, Miller 1987).	goals confronts managers with the challenge to reduce uncertainty and equivocality about which goals to pursue, about how to pursue a range of diverse goals, and about the possible outcomes of the goals being pursued (Floyd and Lane 2000, Smith and Tushman 2005).	
816	Participation in cross-functional interfaces increases managers' ability to effectively confront and resolve conflicts with other managers in several ways— for example, by stimulating discussion and cooperation among them (Duncan 1976, p. 181), by stimulating trust among them (Adler et al. 1999, p. 52), and by motivating systematic attempts to scrutinize and reconcile divergent perspectives (Miller 1987, p. 11).		
816	increasing decision-making authority of managers positively relates to their ambidexterity by increasing their motivation to use and refine their existing skills and expertise as well as to develop new skills and expertise (Crossan and Berdrow 2003, McGrath 2001, Floyd and Lane 2000).		
817	Participation in cross-functional interfaces increases managers' opportunities to do so by creating a context for managers with different backgrounds to learn from each other (Gibson and Birkinshaw 2004) and by offering opportunities to exchange knowledge which enables participants to acquire both new and diverse knowledge and related and complementary knowledge (Egelhoff 1991, Jansen et al. 2005).		
817	Hypothesis supported: There will be positive interaction effects between a manager's decision-making authority and connectedness of the manager to other organization members, on this manager's ambidexterity.		A5
817	Increasing managers' decision-making authority positively relates to these managers' ambidexterity by stimulating their willingness to become aware and recognize a large diversity of organizational, market, and technological opportunities and needs (Pierce and Delbecq 1977, Sheremata 2000, Tushman and O'Reilly 1996).	Increasing the size of managers' networks helps them to become more aware and recognize a larger diversity of such opportunities and needs, by creating more possibilities to search for and identify different ideas, information, and inputs from organization members across hierarchical levels and organizational units (Birkinshaw and Gibson 2004, Burt 1992, Jaworski and Kohli 1993).	A5

817	increasing the decision-making authority of managers positively relates to their ambidexterity because it makes them more sensitive to thoroughly understanding the identified diverse needs and opportunities before acting upon them (Adler et al. 1999, Sheremata 2000).	However, understanding ideas, information, and inputs from different units and levels in an organization may be difficult because they tend to develop different languages, world views, and thought worlds (Burns and Stalker 1961, Duncan 1976).	
817	Increasing connectedness of a manager to other organization members enhances this manager's ability to better understand and act upon the identified diverse needs and opportunities.	This understanding can be improved through the ability of densely connected networks to reduce ambiguity surrounding different needs and opportunities by engaging into frequent, reciprocal, and nonroutine information processing (Daft and Lengel 1986, Egelhoff 1991).	
817	increasingly dense networks may have dampening effects on managers' ambidexterity by diffusing strong norms and creating a dominant logic (Bettis and Wong 2003, Miller 1993, Rowley et al. 2000).	This constrains managers to perform broad searches for knowledge and information (Jansen et al. 2005), and it reduces their openness to different opportunities, needs, and perspectives (Nahapiet and Ghoshal 1998). Increasing levels of managers' decision-making authority may, however, countervail these negative effects of densely connected networks (Sheremata 2000, p. 401). For instance, increasing decision-making authority stimulates managers to broaden their search for knowledge and information outside their current network of contacts (Jansen et al. 2005, p. 1001), leading to a richer network of diverse knowledge (Hage and Aiken 1967, p. 510).	
817	increasing decision-making authority enlarges the diversity of managers' perspectives (Zmud 1982), increases variety in their experience (McGrath 2001), and enlarges the range of diverse solutions they find to problems (Atuahene- Gima 2003).		
818	Hypothesis supported: There will be positive interaction effects between formalization of a manager's tasks and participation in cross-functional interfaces by the manager, on this manager's ambidexterity.		A5
817	Increasing formalization of managers' tasks negatively relates to their ambidexterity by fostering singleness of purpose and hence decreasing the range of different goals these managers are likely to pursue (Hage 1965, Pierce and Delbecq 1977).	Participation in cross-functional interfaces may reduce these effects of formalization; it forces managers to increase the range of different goals to take into consideration (Miller 1987, Whetten 1978) because it demands that they cooperate with other managers who are likely to differ in terms of interests, perspectives, beliefs, and values (Duncan 1976).	A5
817	increasing formalization of managers' tasks negatively relates to managers' ambidexterity because it increases their sense of isolation resulting in a reduced motivation of these managers to combine efforts with others (Hage and Aiken 1969, Organ and Greene 1981).	However, participation in cross-functional interfaces pulls managers out of their isolation and increases their motivation to combine efforts with others. For instance, it positively influences motivation to work together to solve problems (Sheremata 2000), to implement innovations (Duncan 1976), and to generate mutual commitment to make and realize decisions (Bahrami and Evans 1987).	

817	increasing formalization of managers' tasks negatively relates to these managers' ambidexterity by stimulating them to increasingly develop expertise within the specialized area of their formalized tasks (Hage 1965, Zander and Kogut 1995) and by making it more difficult for them to broaden their knowledge and skill base (Daft and Lengel 1986).	Effective participation in cross-functional interfaces, however, requires managers to understand, enter into discussion, and interact with managers from different fields of expertise and with different knowledge (Egelhoff 1991, Ghoshal and Bartlett 1988).	
818	participation in cross-functional interfaces stimulates managers to learn from each other (Nonaka and Konno 1998); to broaden their expertise beyond the narrow confines of their own job (Bahrami and Evans 1987, Miller 1987); and to broaden their knowledge base by acquiring, assimilating, and using new knowledge (Jansen et al. 2005).		
818	Hypothesis supported: There will be positive interaction effects between formalization of a manager's tasks and connectedness of the manager to other organization members, on this manager's ambidexterity.		A5
818	An increasing size of managers' networks across organization units and hierarchical levels may more than compensate for these effects of formalization by extending the number of information channels by which a manager can access valuable ideas, insights, and information (Burt 1992, Ghoshal et al. 1994).	Increasing formalization of managers' tasks negatively relates to these managers' ambidexterity because formalization increases the possibility that a manager becomes less receptive to decision-making stimuli that are not monitored by formal systems (Cyert and March 1963).	A5
818	an increasingly dense network of personal contacts positively influences the speed by which these ideas, insights, and information become available to the network members (Burt 1992, Nahapiet and Ghoshal 1998).		
818	Increasing formalization of managers' tasks negatively relates to their ambidexterity by reducing the extent to which these managers establish and maintain interpersonal relations (Hage and Aiken 1969, Pugh et al. 1963).	Moreover, it may increase a sense of isolation, resulting in a reduced motivation to cooperate and combine efforts with others (Organ and Greene 1981, Pierce and Delbecq 1977). Increasing levels of connectedness with other organization members may compensate these effects because doing so is directly associated with establishing and maintaining an increasing number of interpersonal relations (Jaworksi and Kohli 1993). Furthermore, increasing levels of densely connected relations decreases the network members' sense of isolation and increases their motivation to cooperate and combine efforts by developing trust and mutual identification (Adler and Kwon 2002, Coleman	

		1990), by providing a common frame of reference (Coleman 1990, Uzzi 1997), and by reducing the probability of opportunistic behavior (Rindfleisch and Moorman 2001).	
818	increasingly dense networks may have dampening effects on a manager's ambidexterity because maintaining a large and densely connected network requires time and effort which is associated with increased costs and reduced efficiency in performing tasks and with reduced speed in completing both explorative and exploitative projects (Hansen et al. 2001, Uzzi 1997).	Increasing levels of formalization of managers' tasks may undo these negative effects of increasing levels of connectedness as increasing formalization of tasks is associated with higher production, greater efficiency in performance, and increased speed of decision making (Baum and Wally 2003, Hage 1965, Hall et al. 1967).	
824	Managers responsible for ambidextrous forms can choose to compensate their formal mechanistic structure by encouraging decision-making authority, cross-functional interfaces, and connectedness among their managers.	A well-established stream in contingency theory has examined mechanistic versus organic forms, stressing internal fit and consistency between coordination mechanisms (Burns and Stalker 1961, Duncan 1976, Lawrence and Lorsch 1967). However, our results seem to support hybrid or simultaneous forms that combine the formal structure with strong cross-functional integration and internal networks. In these illogical designs, according to contingency theory, there is a coexistence of formal organization structure and horizontal ties.	A5
824	On the other hand, they can also seize upon the formalization devices to solidify and extend a more homogeneous orientation of their managers.		
824	This simultaneous expression of formal hierarchical structure and horizontal relationships fosters their managers' ambidexterity.		
825	cross-functional interfaces may have greater capacity for enabling business unit level managers' ambidexterity as compared to operational level managers' ambidexterity.	One of the main characteristics of cross-functional interfaces is that they allow for establishing interactions and building relationships across internal vertical, horizontal, and lateral organizational boundaries (Martinez and Jarillo 1989, Galbraith 1973).	A5
825	importance of formal structural coordination mechanisms for operational level managers' ambidexterity.		A5
825	Investigating ambidexterity at the manager level of analysis highlights an important insight for managerial practice: the importance of both these managers' supervisors, which may reside at lower levels in the organization than corporate management, and the managers themselves for shaping these managers' surroundings, and, consequently, their ambidexterity.	Regarding a manager's decision-making authority and formalization of tasks, and to a large extent participation in cross-functional interfaces, the locus of action is most likely with that manager's direct supervisor and that manager's supervisors at higher levels. With regard to the connectedness of a manager to other organization members, the locus of action may be more with the manager him- or herself, as connectedness comprises a more "voluntary and personal mode of coordination" (Tsai 2002, p. 181).	A5

Luo & Rui (2009)			
50	EM MNEs' ambidexterity has at least four dimensions or properties: co-orientation, co-competence, co-opetition, and co-evolution.	Each "co" entails two distinct or contrasting elements that occur simultaneously for a given EM MNE (emerging market multinational enterprise).	C11
50	Co-orientation means that EM MNEs simultaneously seek short-term survival and long-term growth in a balanced manner.	In doing so, they need to leverage their existing competitive advantages for short-term survival and reasonably rapid returns on investment while acquiring assets that promote longer term growth, organizational scalability, and resilience to external shocks. These assets are technological (e.g., patents), intellectual property (e.g., brands), operational (e.g., labor skills and local knowledge), and organizational (e.g., experience). They can be acquired from longer established companies or developed internally.	C11
50	Co-competence means that EM MNEs deploy, exploit, and utilize both transactional (market-based) and relational (network-based) capabilities as they navigate and operate internationally.	Possession and exploitation of relational capability is generally more salient or significant for EM MNEs than for advanced country MNEs.	
50	Co-opetition denotes the situation in which EM MNEs simultaneously compete and cooperate with their international business stakeholders (such as rivals, partners, suppliers, distributors, and home and host country governments).	This enables them to benefit from collaborative competitive advantages and use them to overcome the constraints of foreignness and lateness.	
50	co-evolution occurs when EM MNEs simultaneously respond to and actively influence the external (especially institutional) environment they face in both home and host countries.	Thus, co-evolution emphasizes both compliance/adaptation to external constraints and influence/change over those constraints as ways for firms to deal with the external conditions.	
67	Internally, firm-specific factors come into play, including ownership structure, international experience, organizational skills, and strategic intent.	We see two categories of contingency factors that may explain some degree of heterogeneity in ambidextrous behaviors among EM MNEs.	C11
67	Externally, market-specific factors may also come into play as contingencies.		
67	Private firms may be structurally better suited than publicly listed firms to balancing short- and long-term goals.		C11
67	Companies with greater experience of international competition may be more capable of managing disparate objectives, such as tensions between cooperation and competition and between adaptation and influence.		

67	firms with greater organizational skills in designing and governing globally dispersed activities may be more proficient at blueprinting and implementing ambidexterity plans and able to generate higher risk-adjusted returns from ambidextrous actions.		
67	Strategic intent is relevant too, as it determines the extent to which the firm wants to proactively fulfill two disparate, risky, and difficult-to-manage objectives.	For example, firms with sharpened strategic intent are more likely to opt for influence than for adaptation, regard their environment as malleable, and vie for learning and the leverage of transactional competence over that of relational competence.	
67	The type of market EM MNEs enter affects the ambidexterity design because of different opportunities and threats they encounter.	It is possible that those entering advanced markets will put more weight on transactional competences, while firms active in less developed markets may rely more on relational competences.	C10
67	Ambidexterity may also be contingent on the nature of the institutional environment in the target market.	The propensity to actively influence regulatory policies vis-a`-vis compliance, for instance, will depend in part on the extent to which firms are given channels of influence over new regulations.	
67	the openness of a target market, or the degree to which the market is connected to and integrated with the global market and resources, matters because ambidexterity is a function of the market options available to the firm, which are in turn determined by such openness.	Sunk and exit costs associated with ambidextrous activities will be much higher for EM MNEs investing in economically independent or relatively closed economies.	
Lubatkin, Simsek, Ling, & Veiga (2006)			
647	Intended to capture the level of the senior team's wholeness and unity of effort, a behaviorally integrated TMT is better able to synchronize the team's social and task processes, including the quality of information exchange, collaborative behavior, and joint decision making (Hambrick, 1994; Simsek, Veiga, Lubatkin, & Dino, 2005).	SMEs lack the amount of slack resources and the kind of hierarchical administrative systems that can help or impede larger firms in managing their contradictory knowledge processes and, thus, affect the attainment of ambidexterity. For example, larger firms can manage these processes by creating structurally separate business units, some focusing entirely on exploitation and others entirely on exploration. Lacking these facilitating mechanisms, we argue, SMEs have to rely more on the ability of their TMT to attain ambidexterity. In particular, because SMEs have fewer hierarchical levels, their top managers are more likely to play both strategic and operational roles and, therefore, they directly experience the added dissonance of competing knowledge demands inherent in the pursuit of an ambidextrous orientation.	A4
647	a TMT's level of behavioral integration directly influences how its members deal with the contradictory knowledge processes that underpin the attainment of an exploitative and exploratory orientation, such that greater integration enhances the likelihood of jointly pursuing both.		
647	the level of TMTs' behavioral integration in SMEs is pivotal in effectively coping with, and		

	integrating, these disparate demands.		
648	Exploitation primarily involves learning from a top-down process, in which senior managers move to institutionalize those routines and behaviors that are best suited for refining current competencies.		A5 B6
648	exploration generally involves a bottom-up learning process, in which senior managers are persuaded to abandon their old routines and make a commitment to a new course of action (Wooldridge & Floyd, 1989).		
649	exploration necessitates developing new skills and internal selection processes that are expected to yield a sufficient variety of autonomous strategic initiatives, that is, experiments with new skills or market opportunities that are triggered by shifts in factor or product markets (Burgelman, 1991).		
649	exploitation entails largely formalized interactions between levels of management.		
649	exploration entails intensely sociopolitical interactions that, because they are influenced by where managers reside in the organization's hierarchy, may cause managers to perceive the need to adapt differently (Weick, 1995).		
649	senior managers in SMEs not only ratify and direct their firm's strategy, as do their counterparts in larger firms, but they also participate more directly in the day-to-day implementation of those strategies, as do the operating managers in larger firms.	Consequently, these managers are closer to the firm's existing competencies and, therefore, are knowledgeable about when and how to exploit them. They are also closer to the markets and, therefore, are positioned to be more aware of changing trends in customer demand. This enables them to potentially discover, evaluate, and champion new market opportunities more directly—activities that lie at the heart of exploration.	A3
649	despite facing fewer organizational learning impediments, senior managers in SMEs will experience dissonance in trying to reconcile contradictory knowledge demands, particularly because they are often expected to play both operating and strategic roles.	Reconciling this dissonance places a premium on the kind of TMT processes that encourage the sharing of valuable insights, along with a platform for reconciling contradictory role demands.	A1 A4
650	the ability to jointly pursue exploitation and exploration in SMEs is directly rooted in the extent to which their TMTs are behaviorally integrated.		

651	behaviorally integrated TMTs in SMEs are better able to manage the contradictory knowledge processes, which are required to attain an ambidextrous orientation.		A4
651	by synchronizing the social and task processes associated with collaborative behavior, quality of information exchange, and joint decision making, a behaviorally integrated TMT can promote a more diverse and deeper understanding of the team's existing explicit knowledge base, as well as a better use of that base.	In effect, such synchronization increases the "opportunity for feedback and error correction and . . . synthesis of different points of view" (Tushman & Nadler, 1978: 618). Said differently, the extent to which a TMT is behaviorally integrated is positively associated with an SME's ability to adapt to current environmental challenges, by revealing ways to further refine the firm's existing technological and marketing trajectories to the senior executives.	A4
651	by promoting a collaborative, high-quality exchange of information, behavioral integration engenders social mechanisms such as trust and reciprocity (Coleman, 1990; Granovetter, 1985; Uzzi, 1997), which should further serve to dissipate a team member's reluctance to sharing tacit knowledge, critical to exploration.	Therefore, behaviorally integrated TMTs should be better able to draw from a diverse set of insights from their senior executives—each a repository of tacit knowledge based on frequent interactions at the operating level with the external market and internal organizational environment. Such divergent knowledge sharing promotes the TMT's externalizing and combining of its tacit knowledge base and, therefore, the discovery of new opportunities.	A4
652	Hypothesis supported: The level of behavioral integration of TMTs in SMEs is positively associated with the extent to which they pursue an ambidextrous orientation.		A4
652	a behaviorally integrated TMT acts as a forum in which senior executives can openly and freely exchange contradictory knowledge, resolve conflicts, and create a set of shared perceptions that then can be integrated and acted upon, thereby facilitating the firm's development of a more ambidextrous orientation.	In a climate of collaboration, where a general predisposition also exists to freely exchange information and jointly make decisions, we expect that the TMT members will be more receptive to a broad range of initiatives. And, from an open discussion of existing and new market opportunities, coupled with a willingness to share explicit knowledge and tacit insights, such a team will be more apt to uncover ways to feasibly pursue new markets, while jointly expanding existing ones.	A4
668	What may be required is to have a CEO with the leadership ability to foster greater behavioral integration among the members of his or her TMT.	CEOs are generally uniquely positioned to do this, given their responsibility for selecting, evaluating, motivating, and coaching the TMT members.	A4
668	senior managers of larger firms in search of greater ambidexterity may want to reconsider creating structurally separate business units that focus on either exploitation or exploration, and instead strive to create business units that are capable of pursuing both.		B6

Lin, Yang, & Demirkan (2007)			
1648	Hypothesis supported: A large firm will tend to benefit more from an ambidextrous formation of exploratory and exploitative alliances, whereas a small firm will tend to benefit more from a focused formation of either exploratory or exploitative alliances.		C9
1648	Benefits from ambidexterity in alliance formation will be amplified for large organizations if they can not only exploit established relations to generate cash flow but also explore new territories to overcome the problem of organizational inertia (Leonard-Barton 1992).	Conversely, resource constraints in small firms prevent them from seeking an ambidextrous alliance formation (Markino and Inkpen 2003) and also increase the possibility of being stuck in the middle. Small firms are also associated with younger age and lower status, which may further limit their flexibility in alliance formation (Stuart 2000).	C9
1648	Given their relatively loose resource constraints, large firms are able to allocate substantial amount of their resources to both exploration and exploitation without the threat to immediate survival.		
1648	Hypothesis supported: A firm with an ambidextrous formation of exploratory and exploitative alliances will tend to exhibit better performance in an uncertain environment, whereas a firm with a focus approach will tend to have better performance in a stable environment.		C9 C10
1648	An ambidextrous approach will thus strategically balance these two demands and generate better performance in an uncertain environment.	The consequence of overexploitation in uncertain environments may result in competence trap (Levinthal and March 1993) and lead to core rigidities (Leonard-Barton 1992). At the same time, over-exploration for the purpose of flexibility can result in chaotic organization, which makes it impossible to retain a sense of identity and continuity over time. Conversely, a stable environment is characterized by a slower change in the competitive landscape, in which dominant product design and process technologies are usually clear (Hambrick et al. 1982).	C10
1649	Hypothesis supported: A firm with a high degree of centrality in the alliance network will tend to have better performance if it adopts an ambidextrous formation of exploratory and exploitative alliances, whereas a focused formation of alliances will tend to bring better performance to firms with a low degree of centrality.		C11

1648	central firms can have a larger pool of relations, which they can exploit or explore to their advantages.	Firm Centrality is defined here as the extent to which a firm occupies a central position with strong ties to other network members (Wasserman and Faust 1994). Peripheral firms, on the contrary, are left with limited alternatives to compete in the network. They are devoid of network resources and lack the flexibility to pursue both exploration and exploitation efficiently (Dyer and Singh 1998). To avoid spreading their limited resources too thin, those firms with a low degree of centrality will increase their performance by focusing on one strategy and maximizing the value of either exploration or exploitation.	C11
1649	central firms may benefit from exploiting existing relations in interfirm networks (e.g., Ibarra 1993).		
1649	If central firms can reverse the tendency toward over-embeddedness by engaging in exploration of new relationships along with exploitation of existing ones, they should be able to achieve better performance.		
1650	Hypothesis supported: A firm with a high degree of brokerage positions in the interfirm network will tend to have better performance if it adopts a focused formation of either exploratory or exploitative alliances, whereas an ambidextrous formation of alliances will tend to bring better performance for firms with few structural holes.		C11
1649	firms with a low degree of brokerage positions tend to perform better with an ambidextrous approach in alliance formation.	Firms can also derive benefits in a network by arbitraging resource and information flows between two otherwise disconnected actors in the network (Burt 1992). Players who span the holes will be in a better position to overcome the local search for distant and unique knowledge (Rosenkopf and Almeida 2003), efficiently transfer knowledge, maneuver among disconnected clusters, and reap the information and control benefits over other actors (Burt 1992). Firms with few structural holes have to overcome their structural disadvantage in order to develop long-term competitive advantage. Building relationships with new alliance partners repositions firms in their networks and gradually confers them a competitive advantage (Perry-Smith and Shalley 2003). Second, they have to rely on existing relations to generate constant support and resources for network expansion.	C11
1650	Hypothesis supported: A firm with an ambidextrous formation of exploratory and exploitative alliances will tend to have better performance in early years of the network, whereas a firm with a focused formation of either exploratory or exploitative alliances will tend to have better performance in later years of the network.		C11

1650	when the network is new and firms have little past experience to rely on, having a focused approach in alliance formation may be highly risky because firms may become locked into unproductive relationships or inefficient expansions (Gulati et al. 2000).	Strategic alliance formation is a process of dynamic evolution (Dyer and Nobeoka 2000), through which interfirm relationships are strengthened or weakened and network characteristics evolve. Given that alliance formation is a function of firms' past interactions (Gulati 1995a), we posit that the performance implications will change at different stages of network development (Doz 1996).	C11
1650	having an ambidextrous formation of alliances may help firms to avoid the danger of committing too much too early.		
1650	firms will be better off when they adopt an ambidextrous approach in a young network.		
Lichtenthaler & Lichtenthaler (2009)			
1332	Regarding ambidexterity research (Ambos et al., 2008; Tushman and O'Reilly, 1996), the framework suggests that firms need to balance the development of the knowledge capacities.	For instance, Lucent traditionally excelled at inventive capacity, but it had difficulties in internally exploiting its knowledge (Carpenter et al., 2003). However, Lucent enhanced its balance between exploration and exploitation by strengthening its technology licensing activity through actively developing desorptive capacity (Chesbrough, 2003).	B6 C12
1333	In particular, firms not only need to achieve internal balance but also have to design their knowledge processes to achieve evolutionary fitness at their organizational boundaries (Zajac and Olsen, 1993).		
1333	this article points to new types of ambidexterity by combining internal and external knowledge processes because prior ambidexterity research has usually focused on exploration and exploitation inside the firm (Raisch and Birkinshaw, 2008).	Cisco, for example, combined its strong innovative capacity with a high level of absorptive capacity.	
1333	These ways of achieving ambidexterity by aligning internal and external knowledge management processes represent a particularly fruitful avenue for further research.		
1334	firms need to develop the knowledge capacities to address their current knowledge processes.	As the markets for knowledge expand the strategy space (Rivette and Kline, 2000), they offer the potential for radical strategic change. The development of a knowledge capacity requires time and effective knowledge integration across intrafirm boundaries (Crossan et al., 1999). Usually, this evolution has to include changes in organizational structure and culture, e.g. overcoming 'not-invented-here' attitudes (Cohen and Levinthal, 1990). A central challenge that firms face is the creation of a systematic openness to reconfiguring the knowledge capacities in order to shape and	C12
1334	companies have to build up knowledge management capacity to reconfigure and realign the knowledge capacities.		

		adapt to their environment (Zahra et al., 2006).	
Kaplan & Henderson (2005)			
517	because cognitive frames and incentives are tightly intertwined in an organization, any attempt to change one must be accompanied by a change in the other.		B8
518	actors can also purposefully break and remake the connection between frames and incentives by mobilizing a powerful enough group around an alternative viewpoint.		
518	sophisticated managers who understand the tight linkages between cognitive frames, interests, and incentives can intervene to create effective coalitions for radical action.		
Kang & Snell (2009)			
69	specialist human capital is ceteris paribus less likely to focus on exploration and more likely to focus on exploitation.	Because specialist human capital embodies domain-specific knowledge or 'thought worlds' (i.e. information-processing, interpretation systems, expectation of events or phenomena), it tends to be more effective for acquiring and assimilating new, in-depth knowledge within a narrow range of parameters (Brown and Duguid, 1991).	B8
69	generalist human capital not only provides the variety of knowledge immediately available for alternative tasks, but also the potential adaptability to discover, comprehend, combine, and apply new knowledge in the future (Shane, 2000; Taylor and Greve, 2006; Wright and Snell, 1998).	Generalist human capital tends to be less entrenched in a particular perspective (i.e. less susceptible to functional bias) and, by definition, more broadly positioned in multiple knowledge domains.	
69	generalist human capital tends to be more predisposed to exploratory learning.		
69	the cooperative relational archetype supports efficient acquisition and integration of fine-grained and in-depth knowledge, thereby facilitating exploitation.	The cooperative relational archetype is described as a tightly coupled social system that includes strong and dense network connections, generalized or institutional trust based on membership in the social unit, and shared understanding of how knowledge can be combined (referred to as architectural knowledge).	B8
70	the entrepreneurial relational archetype facilitates the flexibility required to expand, acquire and absorb novel knowledge, thereby helping firms to	The entrepreneurial relational archetype is described as a more loosely connected social system. It is characterized by weak and non-redundant relational networks, resilient dyadic	

	pursue exploratory learning.	trust that is developed through direct personal experiences, and common component knowledge that reflects shared technical, professional, or operational knowledge.	
70	Mechanistic organizational capital such as standardized processes and structures, detailed routines, and rule following cultures tends to reinforce efficient coordination by establishing ingrained patterns of behaviour and interdependence.	Standardized processes capture and institutionalize existing knowledge within organizational routines that help establish a common frame of reference among employees. Over time, those employees see things similarly and this economizes on the amount of discussion required for interpretation and understanding (De Boer et al., 1999). accumulated knowledge embedded in mechanistic organizational structures is typically perceived as more reliable, robust, and legitimized. This tends to bias an organization's problem solving activities towards decision sets that have previously proved useful (cf. Subramaniam and Youndt, 2005).	B8
70	Organizational learning in this instance tends to proceed within the confines of refining and improving existing knowledge (i.e. exploitation).		
70	organic organizational capital (or simple and enacted routines, structures, and cultures) is, by definition, more loosely connected to precedent, rules, and traditional expectations about work.	Rather than prescribing detailed rules or processes, organic organizational capital provides opportunities and autonomy for individuals and groups to experiment with both the way they work and the way they organize that work. This not only helps to establish more flexible behavioural repertoires, but also engenders alternative (and perhaps creative) perspectives and interpretation systems (Daft and Weick, 1984).	
71	organizations are in a better position to consistently search and absorb novel information as well as integrate new knowledge associated with exploratory learning.		
71	exploration seems to be supported by an intellectual capital architecture composed of generalist human capital, entrepreneurial social capital, and organic social capital.	In this architecture, individuals are exposed to a variety of ideas through their careers histories and social contacts and have flexible cognitive abilities and motivation to combine diverse knowledge. Organizations also tend to encourage them to continuously generate and apply creative ideas for organizational problem solving.	B8
71	exploitation would be supported by an intellectual capital architecture comprised of specialist human capital, cooperative social capital, and mechanistic organizational capital.	In this architecture, individuals who do not hold diverse knowledge may access others' knowledge through social interactions, yet focus on myopic learning to refine and improve the knowledge domains embedded in historic decisions of the firm (due to the requirements of mechanistic organizational capital).	B8
71	One viable option that enables firms to pursue exploitation and exploration is so-called partitioning, which separates the two forms of learning in space and/or time (Adler et al., 1999; Benner and Tushman, 2003; Burgelman, 2002).		B6

73	the success of partitioning strategies requires a firm's meta-capability (e.g. managerial capabilities or temporal decentralization) of coordinating and integrating separate learning processes within the firm.		
73	a firm can establish a continuous process of exploitation and exploration by establishing organization context that enables and encourages every individual in the organization to allocate his or her time and effort to look for new knowledge and/or configure new combinatory mechanisms, and concurrently cultivate or streamline new value-creating ideas.	This approach requires the collective orientation of individuals towards dual capacities, rather than a higher-level separation or partitioning of those capacities (Gibson and Birkinshaw, 2004).	B7
75	specialist human capital provides the deep expertise needed for exploitive learning, and it is supplemented by cooperative social capital that helps those specialists to share, integrate, and refine idiosyncratic knowledge for deeper exploitation.	Refined interpolation, focuses on the combination of specialist human capital, cooperative social capital, and organic organizational capital.	B8
75	At the same time, cooperative social capital expands the pool of people-embodied knowledge as a whole by helping specialists to be connected to diverse knowledge.		
76	cooperative social capital can reinforce specialists' abilities for exploitation by affording them with a chance to expand and refine knowledge in their own specialized areas and simultaneously to identify and mobilize others' knowledge.		
76	Organic organizational capital encourages specialists to continuously integrate and combine the diverse and changing knowledge base, and expands their cognitive frames from 'disciplined problem solving' to 'creative problem solving'.		
76	refined interpolation ensures the collective behavioural orientations of individuals towards ambidextrous organizational learning.		

78	while generalist human capital and entrepreneurial social capital are predisposed to expand the range and variety of knowledge acquisition/sharing (i.e. exploration), mechanistic organizational capital complements those elements for ambidextrous learning by precluding generalists from jumping into continuous exploration cycles of pursuing new knowledge and new combinations with ever-increasing objectives; instead, it provides a countervailing mechanism to ensure that the variety and novelty can in turn be integrated and refined in efficient ways (i.e. exploitation).	Within disciplined extrapolation, the intellectual capital architecture blends generalist human capital, entrepreneurial social capital, and mechanistic organizational capital.	B8
78	disciplined extrapolation represents an alternative configuration of human, social, and organizational capital to support ambidextrous organizational learning.		
78	refined interpolation and disciplined extrapolation represent the synergistic combinations of human capital with social capital to amplify people-embodied knowledge and with organizational capital to complement and transform people-embodied knowledge into organizational knowledge.	But while theory suggests that these are the best approaches to ambidextrous learning, they are not the only possible combinations. In four alternative configurations other than the two we have described, human and social capital are not aligned with each other towards a particular learning orientation (exploitation or exploration).	B8
79	Human resource management practices may provide the most obvious methods for overtly aligning human, social, and organizational capital.		B8
79	The development system, including skill requirements, job specification, rotation and training, is most strongly linked to managing human capital.		B8
79	Regarding formal job designs, job rotations, broad or loosely-defined, and serendipitous job designs (the creation of jobs around the unique experience, knowledge, skills, and abilities of current or newly hired employees) increase the opportunities and motivation for individuals to experience a wide variety of tasks (Lado and Wilson, 1994; Lepak and Snell, 1999; MacDuffie, 1995).	Firms that focus on developing generalists are likely to use 'skill-based development' including broad and multidimensional job designs, job rotations, recruiting/selection based on potential (aptitude), and so on (Lepak and Snell, 1999; MacDuffie, 1995).	B8
79	regarding staffing at entry and non-entry levels, firms that focus on developing generalist human capital tend to use recruiting/staffing practices (e.g. cognitive ability and aptitude		

	tests) that place priority on employee potential and openness to learn new skills.		
80	Firms also develop generalists through extensive training to focus on future skill requirements beyond current job requirements.		
80	generalists can be developed with skill- or knowledge-based incentive systems, which encourage individuals to learn new knowledge and ideas beyond their immediate jobs (Guthrie, 2001).		
79	Narrow and tight job definitions, idiosyncratic job designs, and hierarchical job movement with few job rotations encourage employees to invest in particular functional areas and capitalize on the efficiency of their specialized knowledge.	Firms that focus on developing specialists are likely to use 'job or function-based development' including narrow job designs, focused career development, and recruitment/section based on the fit between persons and jobs.	
80	firms that focus on developing specialists are more likely to consider the fit between individuals' current competence and job requirements as a primary criterion for recruiting and selection (Lepak and Snell, 1999).		
80	firms develop specialist knowledge through intensive training to focus on the improvement of current job-related skills (Bae and Lawler, 2000; Guthrie, 2001).		
80	specialists can be developed with those incentive systems that focus on individuals' performance and effort in current jobs for compensation.		
80	ILM-based employee relations facilitate the development of cooperative relational archetypes that consist of strong and dense ties, institutionalized trust based on organizational membership and norms, and common architectural knowledge in firms.	First, under internal staffing or promotion, individuals tend to share the same organizational membership and to be co-located over their career histories so that they are likely to develop more frequent and dense interactions (Tajfel, 1981). Internal promotions also encourage cooperative behaviours because individuals have a history that is observable prior to moving up the ladder (Osterman, 1984). Socialization, seniority-based compensation, and egalitarian pay structures establish a set of norms, rules and procedures that reduce agency costs and the need for monitoring (Doeringer and Piore, 1971; Osterman, 1984). Finally, internal staffing and socialization induce individuals to develop and internalize common architectural knowledge (Nonaka and Takeuchi, 1995).	B8
80	'internal labour market (ILM)-based employee relations' system, including: (1) internal staffing/promotion; (2) seniority-based compensation (including fixed bonus and egalitarian pay structure); and (3) socialization (e.g. mentoring, P-O fit criteria for recruiting and promotion, extensive orientation, team structures, multi-source feedback, etc) (Doeringer and		

	Piore, 1971; Osterman, 1984).		
80	market-based employee relations are likely to increase entrepreneurial social capital in firms.	First, extensive external staffing may induce relatively sparse and weak social ties among individuals by incurring loose organizational memberships, thereby increasing motivation to interact only with colleagues who provide expertise to help address problems and opportunities that arise contemporaneously (Doorewaard and Meihuizen, 2000). In these cases, dyadic trust would not develop unless the results obtained through joint contributions of individuals at work were appropriately rewarded. Performance-based compensation and hierarchical pay structures reinforce individuals' motives to build varied relationships while discouraging social loafing (considered an inherent problem in seniority-based pay) (Eisenhardt, 1989; Leana and Van Buren, 1999). Such benefits of performance-based compensation are best leveraged when focused on the acquisition of knowledge or new ideas (e.g. pay-for-idea or payfor- reputation) (Hargadon and Sutton, 1997). Finally, common component knowledge among individuals can be expanded through general development experiences to improve foundational knowledge and absorptive capacity.	
80	'market or network-based' employee relations system, including: (1) extensive external staffing that utilizes various external sources of human resources; (2) performance-based compensation (e.g. individual incentives, pay for reputation, hierarchical pay structure); and (3) general development experiences (e.g. crosstraining, training for interpersonal skill improvement, social events).		
81	performance/control systems targeted towards 'error avoidance' that uphold specific provisions regarding work protocols help firms to effectively implement and reinforce mechanistic organizational capital (Snell, 1992).	Mechanistic organizational capital assumes that firms accumulate relatively complete information about 'cause–effect relations' in organizational activities or the link between the actions individuals take and the results they achieve. In this case, an important issue is to ensure conformance of individuals to present standards, eliminate uncertainty, and increase predictability of individual behaviours at work.	B8
81	Examples of those HR practices are behaviour (versus result)-based evaluation and rewards, specific behavioural appraisal systems (e.g. behavioural observation scales), and performance programme imposed top-down.		
81	organic organizational capital encourages individuals to develop a variety of behavioural repertories and to flexibly adjust them to perceived situations. These processes can be supported by 'error embracing' performance/control systems that acknowledge mistakes as a natural by-product of learning.	Rather than focusing on error prevention, error embracing systems allow individuals to make decisions, set their own performance goals, and make changes in the ways they perform their jobs (Lepak and Snell, 1999). In fact, these performance/control systems tend to expand empowerment that enables individuals to effectively deal with non-routine and exceptional circumstances requiring creativity and initiative (Arthur, 1994; Bae and Lawler,	

81	Examples of these HR practices include: (1) reduction of status barriers between managers and employees; (2) employees' participation in problem-solving and decision-making; (3) extensive transference of tasks and responsibilities to employees; (4) providing chances to use personal initiatives; (5) encouraging and implementing employee suggestions; and (6) developmental performance appraisal.	2000).	
81	the configuration that supports refined interpolation (architecture one) consists of a job or function-based development system (specialist human capital), an ILM-based employee relations system (cooperative social capital), and an error embracing performance/control system (organic organizational capital).		B8
82	The […] configuration that supports disciplined extrapolation (architecture two) consists of a skill-based development system (generalist human capital), a market-based employee relations system (entrepreneurial social capital), and an error avoiding performance/control system (mechanistic organizational capital).		
Jansen, van den Bosch, & Volberda (2006)			
1663	Hypothesis supported: The higher a unit's centralization of decision making, the lower its level of exploratory innovation.		A5
1663	Because exploratory innovation requires nonroutine problem solving and deviation from existing knowledge, centralization of decision making is likely to reduce exploratory innovation.	Centralization of decision making reflects the locus of authority and decision making (Damanpour 1991) and refers to the extent to which decision making is concentrated in an organization (Aiken and Hage 1968). Centralization narrows communication channels (Cardinal 2001) and reduces the quality and quantity of ideas and knowledge retrieved for problem solving (Nord and Tucker 1987, Sheremata 2000). In addition, it decreases the sense of control over work and diminishes the likelihood that unit members seek innovative and new solutions.	A5
1663	Hypothesis not supported: The higher a unit's centralization in decision making, the higher its level of exploitative innovation.		A5
1663	Centralization of decision authority, therefore, increases information-processing efficiency and facilitates	Previous research has suggested that centralized authority is beneficial to speeding up exploitative innovation (Sheremata 2000).	A5

	exploitative innovation.	Exploitative innovation is limited in scope and newness, and generates less uncertainty about requisites for organizational units (Gopalakrishnan and Damanpour 1994). In this regard, effective decision-making processes for pursuing exploitative innovation tend to be narrowly channeled and more centralized (Cardinal 2001).	
1663	Hypothesis not supported: The higher a unit's formalization, the lower its level of explorative innovation.		A5
1663	Formalization is aimed at reducing variance through incremental improvements in processes and outputs (Benner and Tushman 2003).	Formalization is the degree to which rules, procedures, instructions, and communications are formalized or written down (Khandwalla 1977). The reliance on rules and procedures hampers experimentation and ad hoc problem-solving efforts (March and Simon 1958), and reduces the likelihood of individuals deviating from structured behavior (Weick 1979). Formalization acts as a frame of reference that constrains exploration efforts and directs attention toward restricted aspects of the external environment (Weick 1979). It hinders deviation from existing knowledge and a unit's variation-seeking behavior. Accordingly, formalization constrains exploratory innovations.	A5
1663	Hypothesis supported: The higher a unit's formalization, the higher its level of exploitative innovation.		A5
1663	Through formalization, units codify best practices to make them more efficient to exploit, easier to apply, and to accelerate their implementation (Zander and Kogut 1995).	Zollo and Winter (2002), for instance, argue that formalization facilitates the generation of proposals to improve existing routines. Once changed, these improved routines become standardized activities that will be performed for existing sets of customers (Benner and Tushman 2003). Thus, formalization enhances exploitative innovations through improvement of current products, services, and processes.	A5
1664	Hypothesis not supported: There will be an inverted U-shaped relationship between a unit's connectedness among its members and the level of exploratory innovation.		A5
1663	Connectedness increases opportunities for informal hall talk and accessibility to knowledge sources within organizational units (Jaworski and Kohli 1993).	Beyond a moderate level, however, the density of social networks may limit access to divergent perspectives and to alternative ways of doing things (Nahapiet and Ghoshal 1998, p. 245). As highly dense networks diffuse strong norms and establish shared behavioral expectations, they reduce deviant behavior, limit search scope, and increase selective perception of alternatives (Rowley et al. 2000, Uzzi 1997). Dense social relations among unit members, therefore, will eventually constrain departure from existing	A5
1663	[Connectedness] helps a range of individuals to combine knowledge and develop new knowledge underlying exploratory innovation (Atuahene-Gima 2003, McFadyen and Cannella		

	2004).	knowledge and decrease a unit's exploratory innovation. Accordingly, we expect an inverted U-shaped relationship between connectedness and exploratory innovation.	
1663	social relations assist in establishing legitimacy and in enabling adoption of exploratory innovation.		
1664	Hypothesis supported: The higher a unit's connectedness among its members, the higher its level of exploitative innovation.		A5
1664	To pursue exploitative innovation, on the other hand, organizational units need to efficiently draw on and refine prevailing knowledge (Subramaniam and Youndt 2005).	Connectedness is advantageous for developing trust and cooperation among unit members (Adler and Kwon 2002, Walker et al. 1997). It permits individuals to develop a deep understanding to further refine and improve existing products, processes, and markets (Rowley et al. 2000). Moreover, dense social relations enable unit members to share experiences with regard to how to implement certain improvements (Dyer and Nobeoka 2000).	A5
1664	Connectedness within organizational units, therefore, facilitates improving existing knowledge resources and increases a unit's exploitative innovation.		
1664	Hypothesis supported: Environmental dynamism positively moderates the relationship between exploratory innovation and financial performance.		C10
1664	To minimize this threat of obsolescence, organizational units need to introduce exploratory innovations that depart from existing products, services, and markets.	Environmental dynamism refers to the rate of change and the degree of instability of the environment (Dess and Beard 1984). Dynamic environments may be characterized by changes in technologies, variations in customer preferences, and fluctuations in product demand or supply of materials. Dynamic environments make current products and services obsolete and require that new ones be developed (Jansen et al. 2005, Sorensen and Stuart 2000).	C10
1664	in dynamic environments, we expect organizational units that are pursuing exploratory innovations to increase their financial performance.		
1664	Hypothesis supported: Environmental dynamism negatively moderates the relationship between exploitative innovation and financial performance.		C10
1664	organizational units that pursue exploitative innovations [in dynamic environments] are likely to decrease their performance.	Such organizational units are inclined to exploit existing products, services, and markets. They are likely to fall behind because they become consistently better at performing routines that are less and less valued by the environment (Sorensen and Stuart 2000).	C10
1665	Hypothesis not supported: Environmental competitiveness negatively moderates the relationship between exploratory innovation and financial performance.		C10

1664	environmental competitiveness usually reduces available resources for exploratory innovations (Miller and Friesen 1983, Zahra 1996), and pursuing such highrisk and high-cost innovations would considerably harm the viability of organizational units (Zahra and Bogner 1999).	Environmental competitiveness is the extent to which external environments are characterized by intense competition (Matusik and Hill 1998). Miller and Friesen (1983, p. 223) argue that extensive risk taking, forceful proactiveness, and strong emphasis on novelty (i.e., exploratory innovation) can be hazardous when competitive conditions become more demanding. Outcomes of exploratory innovations tend to rapidly become diffused over the population of competitors (Levinthal and March 1993). Moreover, environmental competitiveness usually reduces available resources for exploratory innovations (Miller and Friesen 1983, Zahra 1996), and pursuing such high-risk and high-cost innovations would considerably harm the viability of organizational units (Zahra and Bogner 1999).	C10
1664	environmental competitiveness negatively moderates the effectiveness of exploratory innovations.		
1665	Hypothesis supported: Environmental competitiveness positively moderates the relationship between exploitative innovation and financial performance.		C10
1664	organizational units reacting to existing trends and demands through modifying or expanding current products, services, and markets (i.e., exploitative innovation) are likely to enhance their performance in competitive environments (Lumpkin and Dess 2001).	They pursue exploitative innovations to better cater to existing customers and build customer loyalty without substantial costs associated with exploratory innovations. Through increased advertising and enhanced tailoring of existing products and services (Miller 1987), these organizational units try to charge a premium and capture additional market share (Zahra and Bogner 1999).	C10
1665	organizational units pursuing exploitative innovation in competitive environments are likely to increase their financial performance.		
1671	units are able to successfully operate in highly competitive environments by expanding current products and services and defending existing markets through increasing customer loyalty.		
Jansen, Tempelaar, van den Bosch, & Volberda (2009)			
797	organizations need to develop such a dynamic capability to implement effective ways of achieving ambidexterity.	Recognize organizational ambidexterity as a dynamic capability by arguing that it refers to the routines and processes by which ambidextrous organizations mobilize, coordinate, and integrate dispersed contradictory efforts, and allocate, reallocate, combine, and recombine resources and assets across differentiated exploratory and exploitative units (O'Reilly and Tushman 2007, Teece 2007).	C13
798	Structural differentiation, or the subdivision of organizational tasks into different units (Hall 1977, Lawrence	It protects ongoing operations in exploitative units from interfering with emerging competences being developed in exploratory	B6

	and Lorsch 1967), can help ambidextrous organizations to maintain multiple competencies that address paradoxical demands (Gilbert 2005).	units. Hence, it ensures that exploratory units are able to enjoy the required freedom and flexibility to develop new knowledge and skills.	
798	Integrative efforts are therefore a necessary step into appropriating the potential value embedded in spatially separated activities (Sirmon et al. 2007).	Achieving ambidexterity requires the subsequent integration and application of differentiated exploratory and exploitative efforts without corrupting the internal structures and processes within each unit's area of operation (Gilbert 2006, O'Reilly and Tushman 2007).	B6
798	ambidextrous designs involve differentiated organizational units and tight senior team integration (Benner and Tushman 2003, Tushman and O'Reilly 1996).	Senior team integration contributes to balanced resource allocation and establishes cross-fertilization across exploratory and exploitative activities (Jansen et al. 2008, Smith and Tushman 2005).	B6
798	ambidextrous organizations need to use formal and informal integration mechanisms to increase knowledge flows across differentiated exploratory and exploitative units (Gilbert 2006, Westerman et al. 2006).	Such organizational integration mechanisms create permeability and enable organizations to obtain and apply strategically valuable combinations.	A5
799	In ambidextrous organizations, structural differentiation results in spatially dispersed exploratory and exploitative units at different locations (Benner and Tushman 2003, Tushman and O'Reilly 1996).	Structural differentiation provides a sense of freedom and ownership over specific work activities and generates structural flexibility to adapt to local conflicting task environments (Child 1984, Orton and Weick 1990).	B6
799	The coordination and integration of exploratory and exploitative efforts across organizational units is a necessary step in achieving ambidexterity (Gilbert 2006, Smith and Tushman 2005, Tushman and O'Reilly 1996).		B6
799	However, for these differentiated competences to be useful, they must be effectively allocated, mobilized, and integrated to generate new combinations of exploratory and exploitative innovation (Sirmon et al. 2007).		C13
799	The implementation or deployment of such combinations and the achievement of ambidexterity requires new organizing logics and collective patterns of interaction (Helfat and Peteraf 2003).		
799	organizational ambidexterity refers to the routines and processes by which organizations mobilize, coordinate, and integrate dispersed exploratory and exploitative efforts, and allocate,	Dynamic capabilities, which are embedded in the distinct ways that organizations integrate, build, and recombine competences flexibly across boundaries, are fundamental to long-term	

	reallocate, combine, and recombine resources and assets across differentiated units.	strategic advantage.	
800	When differentiating exploratory and exploitative efforts, organizations need to subsequently establish certain integration mechanisms to coordinate and integrate operational capabilities developed at spatially dispersed locations.	Achieving ambidexterity creates paradoxical situations because the short-term efficiency and control focus of exploitative units is at odds with the long-term experimental focus and decentralized architectures of exploratory units (Floyd and Lane 2000).	A1 B6
800	to resolve these paradoxical situations, the mobilization, integration, and deployment of operational capabilities at exploratory and exploitative units are a necessary step in appropriating value and achieving ambidexterity.		
800	prior studies have pointed at the distinct roles of senior team and organizational integration mechanisms in achieving ambidexterity.		A4
800	Senior team integration mechanisms need to allow for the allocation of scarce resources and the departure from existing competences and skills within exploratory units (Gilbert 2005, Hill and Rothaermel 2003), yet establish cross-fertilization and strategic synergies with ongoing businesses in exploitative units (Jansen et al. 2008, Tushman and O'Reilly 1996).		
801	senior team integration mechanisms enable balanced resource allocation and strategic coherence in ambidextrous organizations.		
800	organizational integration mechanisms need to enable ambidextrous organizations to access and integrate knowledge sources flexibly across relatively autonomous exploratory and exploitative units (Galunic and Eisenhardt 2001, Gilbert 2006, Henderson and Cockburn 1994).	Organizational integration mechanisms not only facilitate new value creation through linking previously unconnected knowledge sources (Cohen and Levinthal 1990), but also through providing opportunities to leverage common resources and obtaining synergies across exploratory and exploitative units (O'Reilly and Tushman 2007).	
801	organizational integration mechanisms facilitate knowledge exchange and combination between differentiated exploratory and exploitative units (Kogut and Zander 1992, Tsai and Ghoshal 1998).		
800	based on the assumption that certain integration mechanisms are richer and provide a higher information-processing capacity, prior literatures have distinguished between formal and		A5

	informal integration mechanisms (March and Simon 1958, Tsai 2002, Van de Ven et al. 1976).		
800	Formal integration mechanisms are a means to coordinate and integrate differentiated activities through pre-established mechanisms and interfaces (Ghoshal et al. 1994).		
800	Informal integration mechanisms, on the other hand, refer to emergent social properties and have been found to be of influence on boundary spanning across different units (Galbraith 1973, Tsai 2002).		
800	Senior teams in ambidextrous organizations are therefore expected to recognize and translate different, ambiguous, and conflicting expectations across differentiated exploratory and exploitative units into workable strategies.	Resolving this tension in senior management teams is a crucial element in their organization's ability to create integrative and synergetic value across exploratory and exploitative activities and to achieve ambidexterity (Teece 2007).	A5
801	Hypothesis not supported: Senior team contingency rewards mediate the relationship between structural differentiation and ambidexterity.		B8
801	Overall, ambidextrous organizations may use contingency rewards to reconcile conflicts associated with allocating resources to differentiated exploratory and exploitative efforts.	Contingency rewards, which reflect the degree to which benefits for individual team members depend on their team's outcome, are favorable to senior teams confronted with pressures for mutual adjustment (Harrison et al. 2002, Shaw et al. 2002, Wageman and Baker 1997). They create an outcome interdependency within senior management teams (Slavin 1996, Wageman 1995) and urge members to direct attention and behavior toward interdependent rather than individual activities (Siegel and Hambrick 2005). In this sense, ambidextrous organizations generate commitment to complex organizational goals (Bloom 1999, Harris and Bromiley 2007) and foster collaboration across senior team members responsible for differentiated exploratory and exploitative units. Additionally, team contingency rewards encourage senior team members to mobilize and integrate operational capabilities across differentiated units through identifying ways to encourage new combinations (Smith and Tushman 2005). In this sense, senior team members transcend their unit's direct interests and establish new ways to achieve ambidexterity.	B8
801	ambidextrous organizations may establish contingency rewards to motivate senior team members to	This reduces interpersonal competition and facilitates negotiation and mutual adjustment	

	advance thinking and participate in clarifying problems and proposing solutions to complex issues (Wageman 1995).	across differentiated units (Pfeffer 1995).	
801	Hypothesis supported: Senior team social integration mediated the relationship between structural differentiation and ambidexterity.		A4
801	senior team social integration contributes to the mobilization and integration of operational capabilities at differentiated units to arrive at new combinations of exploratory and exploitative activities.	Social integration is a multifaceted phenomenon that reflects the "attraction to the group, satisfaction with other members of the group, and social interaction among the group members" (O'Reilly et al. 1989, p. 22). Socially integrated senior teams are associated with increased negotiation, compromise, and collaboration (Barkema and Shvyrkov 2007, Michel and Hambrick 1992). Members of socially integrated senior teams are not only expected to work harder to recognize and seize opportunities, but also to leverage operational capabilities across differentiated exploratory and exploitative units. Social integration increases collaborative problem solving (De Cremer et al. 2008) and facilitates senior executives to build realistic understandings of key preferences and conflicting roles in senior teams (Eisenhardt et al. 1997).	A4
802	Hypothesis supported: Cross-functional interfaces mediate the relationship between structural differentiation and ambidexterity.		A5
801	Ambidextrous organizations may use cross-functional interfaces such as liaison personnel, task forces, and teams (Gupta and Govindarajan 2000) to enable knowledge exchange across exploratory and exploitative units.	Cross-functional teams and task forces bring together employees from differentiated units who have distinct expertise underlying innovation streams.	A5
801	Cross-functional interfaces facilitate organizational members from distinct units to reach a common frame of reference and to build understanding and agreement (Daft and Lengel 1986, Egelhoff 1991).		
802	Cross-functional interfaces provide platforms that keep multiple innovation streams connected by disseminating operational capabilities and learning about new ways of achieving ambidexterity.	Thus, crossfunctional interfaces facilitate the generation and recombination of knowledge sources, yet retain the integrity of contradictory structures and processes in exploratory and exploitative units (Dougherty 2001, Gilbert 2006).	
802	Hypothesis not supported: Connectedness mediates the relationship between structural differentiation and ambidexterity.		A5

802	Dense social relations within ambidextrous organizations combat the polarization across exploratory and exploitative units.	Connectedness concerns the overall pattern of a firm's social network in terms of density (Nahapiet and Ghoshal 1998, Sheremata 2000) and facilitates knowledge exchange (Jaworski and Kohli 1993). Connectedness is essential for the emergence of shared codes and language. It provides a common base of understanding through which organizational members with disparate experience, knowledge, and backgrounds can transfer and integrate new ideas (Hansen 2002).	A5
802	connectedness affects their ability and motivation to integrate and recombine differentiated knowledge sources at exploratory and exploitative units, thereby mediating the relationship between differentiation and ambidexterity.	Increased interaction fosters collaborative conflict resolution because members from differentiated exploratory and exploitative units have greater opportunities for creating win–win situations.	
806	structural differentiation provides an important yet insufficient structural attribute for achieving ambidexterity.	Structural differentiation helps organizations to buffer experimentation and the development of new competences and capabilities from ongoing operations (e.g., Gilbert 2006, Tushman and O'Reilly 1996). It generates structural flexibility to adapt to local environmental demands (Volberda 1996), yet exploratory and exploitative activities need to be mobilized, integrated, and applied across inconsistent organizational units.	B6
806	ambidextrous organizations need to resolve conflicting tensions in senior teams, and to integrate diverse knowledge sources across differentiated exploratory and exploitative units (Kogut and Zander 1992, Smith and Tushman 2005).	The previously asserted effect of structural differentiation on ambidexterity is indirect, operating through both informal senior team integration (i.e., senior team social integration) and formal organizational integration (i.e., cross-functional interfaces) mechanisms. Ambidextrous organizations should enact differentiated exploratory and exploitative activities by managing resource and routine reconfiguration (Zahra et al. 2006).	B6
806	ambidextrous organizations require a dynamic capability that enables them to mobilize, coordinate, and integrate dispersed contradictory efforts, and to allocate, reallocate, combine, and recombine resources and assets across dispersed exploratory and exploitative units (O'Reilly and Tushman 2007, Teece 2007).		C13
808	At the corporate level, ambidextrous organizations should encourage (informal) social integration among senior team members.	Ambidextrous organizations should carefully design and implement specific types of integration mechanisms at different hierarchical levels. As one comes closer to senior management, integration efforts become more broad, less clear cut, and more complex in nature (Egelhoff 1991, Floyd and Lane 2000). At the senior team level, managers face both high differentiation as well as high interdependency, requiring frequent adjustments and more informal means of integration (Daft and Lengel 1986, Hambrick et al. 2008). At	A4
808	At lower hierarchical levels, however, ambidextrous organizations should establish more formal cross-functional interfaces that deepen knowledge flows across differentiated units yet retain the contradictory processes and time orientation within exploratory and		

	exploitative units.	lower levels in ambidextrous organizations, organizational members still face high differentiation but lower interdependency, calling for more formal integration mechanisms (Daft and Lengel 1986).	
Jansen, George, van den Bosch, & Volberda (2008)			
983	senior teams need to allow for variety and local adaptation, yet facilitate collective action and strategic coherence (O'Reilly and Tushman, 2004).	In this sense, they face considerable role conflicts and role ambiguities as senior teams in ambidextrous organizations are expected to resolve contradictions through joint information processing and tight integration (Floyd and Lane, 2000; Michel and Hambrick, 1992).	A1 A2
983	Encouraging senior executives to work as a team has been suggested as an important mechanism by which strategic leadership can enhance senior team effectiveness in ambidextrous organizations.	Studies have argued that the executive director, as senior team leader, might participate in team processes and thereby influence team dynamics and organizational outcomes (Finkelstein, 1992; Haleblian and Finkelstein, 1993; Hambrick, 1994; Peterson et al., 2003).	A4
984	O'Reilly and Tushman (2004) found that ambidextrous organizations host exploratory and exploitative innovation in structurally independent organizational units that remained strategically integrated into the senior management hierarchy.	In this sense, senior management allows departure from existing knowledge within exploratory units (Gilbert, 2005; Hill and Rothaermel, 2003), yet establishes cross-fertilization and synergies with ongoing businesses in exploitative units (Tushman and O'Reilly, 1996). In addition, they need to allocate scarce resources to both types of units: allowing experimentation and the generation of exploratory efforts by avoiding resource constraints when exploratory activities become overwhelmed by mature businesses.	B6
985	Senior teams in ambidextrous organizations are […] expected to recognize and translate different, ambiguous, and conflicting expectations into workable strategies.	Because of these paradoxical ambidextrous designs, senior teams typically face role conflicts that may diminish acceptance of decisions (O'Reilly and Tushman, 2004). The likelihood of conflict is further exacerbated by the fact that senior team members are responsible for differentiated exploratory or exploitative organizational units (Eisenhardt et al., 1997; Tushman and O'Reilly, 1996). Achieving ambidexterity may enhance self-interested behaviour in which senior team members perceive direct competition regarding the allocation of scarce resources (Bower, 1970). How these conflicting tensions are resolved within senior teams is a crucial element in the ability of firms to create integrative and synergetic value among exploratory and exploitative activities and to achieve organizational ambidexterity.	A1
986	an overarching set of values, team integration processes, and common fate incentive systems enable senior teams to manage inconsistent alignments (Siegel and Hambrick, 2005; Tushman		A2

	and O'Reilly, 1996).		
986	the effectiveness of senior teams in ambidextrous organizations is associated with a set of senior team attributes: (1) shared vision, (2) social integration, and (3) group contingency rewards (Hambrick, 1994; O'Reilly and Tushman, 2004; Siegel and Hambrick, 2005; Smith and Tushman, 2005).		A2 A4 B8
986	leadership behaviour influences the effectiveness of senior teams in ambidextrous organizations.	Strategic leaders may be more or less directive in resolving conflicts and reconciling the paradox of combining exploratory and exploitative innovation. For instance, executive directors may assign different senior team members to exploratory and exploitative activities, recognize conflicts between agendas, and facilitate discussion and debate about possible synergies (Smith and Tushman, 2005).	A3
987	Hypothesis supported: Senior team shared vision increases the achievement of organizational ambidexterity.	A senior team shared vision embodies the collective goals and aspirations of senior team members that express the developmental path for an organization's future (Larwood et al., 1995; Tsai and Ghoshal, 1998). A shared set of goals and values provides a common strategic direction that ameliorates conflicting interests and disagreement. It can override the adverse effects of divergent goals and conflicting perspectives among senior team members responsible for exploratory and exploitative units (Brewer and Miller, 1984; Mackie and Goethals, 1987), and prevent senior teams from devolving into fragmented structures. By contrast, a lack of such shared values can lead to distrust and suspicion within senior teams and throughout the organization, making it hard to draw common characteristics and to identify, extract and combine diverse skills, abilities, and perspectives within exploratory and exploitative units.	A2
986	common goals and shared values in ambidextrous organizations motivate senior team members to generate opportunities for resource exchange and combination across exploratory and exploitative units (Brown and Eisenhardt, 1995; Tsai and Ghoshal, 1998; Tushman and O'Reilly, 1996).		
985	when a shared vision is acknowledged throughout senior teams, members are willing to consider and incorporate opposing views about tactical issues (Simons et al., 1999).		
987	Hypothesis not supported: Senior team social integration increases the achievement of organizational ambidexterity.	Social integration is a multifaceted phenomenon that reflects the 'attraction to the group, satisfaction with other members of the group, and social interaction among the group members' (O'Reilly et al., 1989, p. 22). Social integration differs from shared vision, which refers to shared values and common understanding of collective goals, in that social integration is directly related to affective factors or social forces among senior team members (Smith et al., 1994). Members of socially integrated teams exhibit greater efficiency in task coordination and aspire for team success (O'Reilly et al., 1989; Smith et al., 1994). Socially integrated senior teams are related to increased negotiation, compromise, and	A4

		collaboration across organizational units (Michel and Hambrick, 1992). In this way, members of socially integrated senior teams are expected to work harder to recognize opportunities and synergies for combining exploratory and exploitative activities (Smith et al., 1994). Social integration increases collaborative problem solving that is based on social interaction and trust among senior team members (Dailey, 1978). Such interaction and trust enable senior executives to articulate and develop arguments more effectively and to build realistic understandings of key preferences and conflicting roles in senior teams (Eisenhardt et al., 1997). Social integration stimulates critical debate as senior team members are more likely to evaluate alternative ways to reconcile conflicting goals associated with exploratory and exploitative activities. It provides comfortable and familiar platforms that routinize thorough consideration of conflicting strategic agendas and increases the confidence of senior executives to engage in dissenting viewpoints (Jehn et al., 1997).	
988	Hypothesis supported: Senior team contingency rewards increase the achievement of organizational ambidexterity.	Team contingency rewards foster collaboration and create commitment to organizational goals (Bloom, 1999). They cause senior team members to direct attention and corresponding behaviour to interdependent rather than individual activities (Siegel and Hambrick, 2005). Team contingency rewards create an outcome interdependency among senior team members (Slavin, 1996; Wageman, 1995) and encourage them to achieve integrative value through identifying ways to use shared resources across exploratory and exploitative units (Smith and Tushman, 2005). In this sense, team contingency rewards motivate senior team members to transcend their unit's direct interests and to establish ways to allocate resources to both exploratory and exploitative innovation. Moreover, they establish norms that motivate senior team members to advance thinking and participate in clarifying problems and proposing solutions to complex issues (Wageman, 1995). Team contingency rewards reduce interpersonal competition and facilitate negotiation and mutual adjustment (Pfeffer, 1995) necessary for exploratory and exploitative units to coexist.	B8
988	contingency rewards, which reflect the degree to which benefits for individual team members depend on their team's outcome, are beneficial to senior teams confronted with pressures for mutual adjustment (Harrison et al., 2002; Shaw et al., 2002; Wageman and Baker, 1997).		
988	In ambidextrous organizations, senior team contingency rewards are likely to urge executives to transcend their unit's direct interests and allocate resources to and achieve integrative value across exploratory and exploitative units (e.g. Smith and Tushman, 2005).		
989	transformational leadership increases the effectiveness of senior team attributes in achieving ambidexterity.	Transformational leaders exhibit idealized influence, arouse inspirational motivation, provide intellectual stimulation, and treat followers with individualized consideration (Avolio et al., 1999). Idealized influence represents the degree to which leaders are admired, respected, and trusted. This dimension includes charismatic behaviour that causes followers to identify with the leader.	A3

		Inspirational motivation is defined as the degree to which leaders articulate an appealing vision and behave in ways that motivate those around them by providing meaning and challenge to their followers' work. Intellectual stimulation is defined as the degree to which leaders stimulate their followers' effort to be innovative and creative by questioning assumptions, reframing problems, and approaching old situations in new ways. Individualized consideration captures the degree to which leaders pay attention to each individual's need for achievement and growth by acting as a coach or mentor (Bass et al., 2003).	
989	Transformational leaders may affect senior team effectiveness by participating in and facilitating senior teams to resolve conflicts and contradictory demands.	Leaders exert their influence by broadening and elevating team members' goals and providing them with confidence in performing beyond expectations (Dvir et al., 2002). Accordingly, leaders in ambidextrous organizations may be more or less directive in affecting senior team dynamics and influence the way how senior teams reach closure on a decision, direct team discussion and structure debate (Edmondson et al., 2003).	A3
989	Intervention of transformational leaders has appeared to be particularly relevant to senior teams with goals and perspective asymmetries across senior team members (Stasser, 1999).	By translating shared goals and collective values in desired behaviour, for instance, transformational leaders enhance the effectiveness of a senior team's shared vision to reconcile conflicting agendas and to implement synergies across exploratory and exploitative units.	A3
990	Hypothesis not supported: Transformational leadership positively moderates the impact of senior team shared vision on organizational ambidexterity.		A3
989	through inspirational motivation, transformational leaders display personal commitment to shared goals and values, and emphasize the ideological importance of a senior team's shared vision (Shamir et al., 1998; Waldman et al., 2006).	The idealized influence of transformational leaders bolsters a sense of belongingness and inspires senior team members to commit to the overarching goals and values across exploratory and exploitative organizational units. To this end, transformational leaders facilitate the implementation of a shared senior team vision by translating shared goals and collective values in desired behaviour and increasing the likelihood that a shared senior team vision is implicated in actual collaborative action (Gardner and Avolio, 1998; Shamir et al., 1998).	A3
989	Through individualized consideration, leaders can also enhance the effectiveness of a shared senior team vision by providing ideological explanations that link exploratory and exploitative efforts of individual senior team members to the achievement of	In this sense, they motivate senior team members to get more involved in searching integrative and synergetic value across exploratory and exploitative units and realize the achievement of shared goals. Hence, by encouraging collaborative action and creating affective response to overcoming conflicting	

	shared goals and values.	agendas, transformational leadership increases the impact of a shared senior team vision on achieving ambidexterity.	
990	Hypothesis supported: Transformational leadership positively moderates the impact of senior team social integration on organizational ambidexterity.		A3
989	transformational leadership also moderates the effectiveness of senior team social integration in ambidextrous organizations.	Transformational leaders use inspirational motivation to emphasize harmonious relationships and encourage shared learning experiences across senior team members with possible conflicting interests (Chen et al., 1998; Vera and Crossan, 2004). Through such intellectual stimulation, transformational leaders induce senior team members to openly discuss conflicting interests. In so doing, they encourage asymmetric information sharing that enhances the quality of decision-making in socially integrated senior teams (Edmondson et al., 2003).	A3
989	idealized influence of transformational leaders facilitates senior team behaviours to cascade to lower hierarchical levels (Avolio and Bass, 1995; Waldman and Yammarino, 1999).	Based on role modelling of transformational leaders, synergetic and integrative efforts of socially integrated senior teams permeate across hierarchical levels. Such efforts inspire organizational members at lower echelons to demonstrate preferred behaviour and search for synergetic possibilities across exploratory and exploitative units to achieve organizational ambidexterity.	
990	Hypothesis not supported: Transformational leadership positively moderates the impact of senior team contingency rewards on organizational ambidexterity.		A3
990	transformational leadership facilitates the acceptance and commitment to senior team contingency rewards in ambidextrous organizations.	Transformational leaders motivate senior team members to think and act in terms of collective interests (Bass, 1985) rather than in direct interests of their exploratory and exploitative units. The idealized influence of transformational leaders involves the display and attribution of role modelling for senior team members that promote the transcendence of ordinary preoccupations and self-interests of senior team members (Bass and Riggio, 2006).	A3
990	Transformational leaders are believed to carefully manage performance-based incentives by recognizing and rewarding effective performance based on values for fairness and trust rather than on exchange agreements (Goodwin et al., 2001).		
990	through inspirational motivation, transformational leaders articulate complex paradoxical challenges into attainable goals and rewards.	As Smith and Tushman (2005, p. 527) explained, such leadership behaviour signals confidence in the ability of senior teams in ambidextrous organizations to reconcile conflicting situations and helps reduce threat and fear among senior team members. By doing so, transformational leaders use individual	

		consideration and intellectual stimulation to express high confidence in the senior team's ability to meet complex expectations, and to increase the team's efficacy that collective aspirations and rewards will be achieved (Bono and Judge, 2003; Shamir et al., 1993). Individualized consideration by transformational leaders may also decrease the probability of senior team members to engage in social loafing, in which senior team members realize that they might 'hide in the team' while still reaping the benefits of contingency rewards (Høigaard et al., 2006). In this way, transformational leaders mitigate the potential negative effect of social loafing resulting from establishing contingency rewards.	
998	organizational ambidexterity requires the development of a strong and compelling shared vision.	A collective aspiration expresses the future developmental path and can prevent ambidextrous organizations from leading into fragmented structures (Hambrick, 1994). Common values and aspirations are an important team attribute that facilitates senior team members to prioritize and interpret problems and reduce conflicts (Simons et al., 1999).	A2
998	shared values and collective goals facilitate team processes that compensate for spatial differentiation in ambidextrous organizations.	Orton and Weick (1990), for instance, argued that shared values may constitute the sole remaining basis that holds together loosely-coupled exploratory and exploitative units. In addition, Ouchi (1980) discussed that goal congruity may serve as a central control mechanism that directs discipline and behaviour of organizational members.	
998	A strong and compelling senior team shared vision, therefore, becomes a primary mechanism for embracing conflicts that stem from senior team members occupying multiple roles with potentially incompatible expectations.	Shared values and collective goals are associated with integrative and synergetic behaviours through which senior teams balance requirements for resource allocation to both exploratory and exploitative efforts.	
999	importance of reward systems in implementing complex strategic choices such as achieving organizational ambidexterity.	Compensating senior team members for overall firm performance decreases the chance of interest asymmetries and encourages senior team members to seek opportunities for strategic synergies across inconsistent exploratory and exploitative organizational units. Senior team contingency rewards reduce interpersonal competition and foster a firm wide view and collaboration (Edmondson et al., 2003; Wageman, 1995) that prevents ambidextrous organizations from drifting towards fragmented structures. Hence, our study contributes to recent insights concerning the importance of team contingency rewards to enhancing organizational performance under highly dynamic environmental conditions (Siegel and Hambrick, 2005).	B8
999	shared pay patterns can be expected to affect the functioning of senior teams in ambidextrous organizations (Siegel and Hambrick, 2005).		
999	'shared-fate' rewards enable firms to combine exploratory and exploitative efforts and to achieve organizational ambidexterity.		

1000	senior team social integration only affects the achievement of organizational ambidexterity in the presence of a transformational leader.	Together with the nonsignificant direct effect of senior team social integration on organizational ambidexterity, it highlights that transformational leaders are necessary to force socially integrated teams to critically debate and openly discuss conflicting task issues. Socially integrated teams may establish strong behavioural expectations, reduce deviant behaviour, and limit divergent perspectives how to establish organizational ambidexterity (Rowley et al., 2000). Our study indicates that socially integrated teams need inspirational and intellectual stimulation on behalf of a transformational leader to debate conflicting interests and to reconcile conflicting demands among senior team members in ambidextrous organizations.	A3 A4
1000	socially integrated senior teams with a transformational leader are more likely to reconcile conflicting demands and debate about inconsistent perspectives at exploratory and exploitative units.		
Im & Rai (2008)			
1282	an ambidextrous organizational design that aligns and adapts objectives simultaneously enables both explorative and exploitative KS.	The study identifies two design characteristics in a relationship - ambidextrous organizational design and ontological commitment to the digital platform - to promote explorative and exploitative KS.	B7
1282	In terms of IT design, we suggest that the extent to which partners rely on digital boundary objects to span knowledge boundaries between partners—a condition we refer to as ontological commitment—impacts both forms of KS.		A1
1284	contextual ambidexterity in the organization design of the long-term relationship should promote both forms of KS [knowledge sharing].	Drawing on Gibson and Birkinshaw (2004), we define contextual ambidexterity as the behavioral capacity of a long-term relationship to allow for the simultaneous pursuit of alignment and adaptability. In general, ambidexterity refers to an organization's capability to conduct two paradoxical things at the same time by requiring organizations and their people to have two heterogeneous but related skills simultaneously (Gibson and Birkinshaw 2004).	B7
1284	contextual ambidexterity is the nonsubstitutable combination (i.e., interaction) of alignment and adaptability of the management system that includes service level agreements, incentives, and planning and review meetings that govern a relationship.		
1284	The contextual elements of the overall management system encompass systems, processes, and beliefs that orient important behaviors, such as KS in a long-term IOR [interorganizational relationship].		B7
1284	Hypothesis supported: The greater the contextual ambidexterity in an interorganizational relationship, the greater the exploitative KS in the relationship.		B7

1284	Elements that focus on alignment promote coherence among goals and activities and the efficient utilization of resources.	Consequently, alignment should promote exploitative KS to increase behavioral consistency and garner efficiency gains.	B7
1284	elements that focus on adaptability promote responsiveness to opportunities through innovation and reconfiguration.	Consequently, adaptability should facilitate the sharing of new ideas and experimentation.	B7
1293	In fact, Gibson and Birkinshaw (2004) note that contextual ambidexterity operates at two levels: the management system itself and the specific actions of individuals.	Thus, customers may engage in specific actions to leverage knowledge that is shared in the relationship so as to create value.	B7
1284	To enable the sharing of knowledge in long-term IORs, digital boundary objects should facilitate exchange across three knowledge boundaries between partners: syntactic, semantic, and pragmatic (Carlile 2002).	We define ontological commitment in a long-term relationship as the reliance of partnering firms on digital boundary objects to span their knowledge boundaries. First, boundary objects should enable the transfer of knowledge across their syntactic boundary based on common syntax, taxonomies, and storage and retrieval technologies. Second, boundary objects should facilitate the translation of knowledge across their semantic boundary based on common meaning. Last, boundary objects should enable the transformation of knowledge across their pragmatic boundary based on the representation of different interests/pragmatics to facilitate negotiation.	A1
1285	digital boundary objects should contain sufficient detail on terminology, protocol, and syntax to be understood by concerned parties when they move across firms (Carlile 2002, Star and Griesemer 1989, Zollo and Winter 2002).		
1285	the aggregate use of digital boundary objects across the three knowledge boundaries should impact KS in long-term IORs.	The concept of boundary objects is grounded in semiotic theory (Ramaprasad and Rai 1996). The theory states that knowledge transformation at the pragmatic boundary is influenced by knowledge translation at the semantic boundary, which, in turn, is influenced by knowledge transfer at the syntactic boundary. Digital boundary objects at one knowledge boundary may or may not depend on those at another boundary. For instance, simulation models to represent and negotiate business processes do not have to depend on XML-based electronic data interchange (EDI) documents to exchange information.	A1
1285	Hypothesis partially supported: The greater the ontological commitment in an interorganizational relationship, the greater the explorative KS in the relationship.		A1
1285	Hypothesis supported: The greater the ontological commitment in an interorganizational relationship, the greater the exploitative KS in the relationship.		A1

1285	ontological commitment increases the ability of partners to span the three knowledge boundaries and promotes the sharing of exploratory and exploitative KS.	Accordingly, we hypothesize that ontological commitment in a long-term IOR leads to greater KS between partners.	A1
1285	The reliance on digital boundary objects should enable KS by establishing standards for representation and transfer of data, facilitating interpretation of information, and promoting mutual discovery.		
1285	[Digital boundary objects] should also enable parties to surface and challenge assumptions, interpret complex situations (Pawlowski and Robey 2004), and reduce causal ambiguity between actions and outcomes (Zollo et al. 2002).	As an illustration, firms in the disk drive industry share knowledge for process improvement by using boundary objects, such as defined format for inventory data, production plans and EDI documents with shared meaning, and simulation models. They also share knowledge for new product development by using boundary objects, such as design schemata and prototypes (Scott 2000).	
1293	reliance on a shared ontology in an IOR promotes both exploratory and exploitative KS for customers, whereas it facilitates only exploitative KS for the vendor.	We extend the Malhotra et al. (2007) finding that the use of one type of boundary object—standard electronic business interfaces—enables the sharing of information of high quality, breadth, and privilege between supply chain partners.	A1
1293	high ontological commitment promotes both forms of KS.	Thus, it is important to evolve digital boundary objects that are used to span the three knowledge boundaries, leveraging synergies across them, when possible.	A1
1293	An initial lexicon needs to be established between partners to represent and transfer data, say, through the mutual adoption of industry process standards or proprietary EDI systems.	Thus, the digital boundary objects to span each knowledge boundary should be evolved based on changes in dependence between partners, the heterogeneity in their information that needs to be combined, the incompatibilities of their information systems, and their shared understanding.	A1
1293	With time, there may be the need to share additional information and coordinate a broader set of activities, which may trigger the greater assimilation of industry process standards and the further development of proprietary EDI message formats or XML tags.		
1293	During the course of the relationship, there may be the ongoing need to describe processes, to discover opportunities for their improvement and innovation, and to negotiate terms and conditions for such change, for which process models and business models can be developed.		

1294	Managers need to recognize the potential benefits from juxtaposing opposing forces of short-run improvement and longrun innovation.		A1
1294	[Managers] should move away from the traditional either-or logic for improvement or innovation and manage the paradox to turn seemingly contradictory forces into synergies.	Toward this end, they should understand the differences in emphasis placed by the partners on exploration and exploitation, the reasons for these differences, and the nature of the knowledge boundaries between the partners.	
1294	Managers responsible for long-term IORs can foster the sharing of exploratory and exploitative knowledge through the design of the management system and information system.	They will stymie this dual knowledge sharing if the management system focuses solely on alignment for improvement or on adaptation for innovation. Instead, they should establish a management system that facilitates and motivates participants in the relationship to examine how to better achieve short-run operational goals and how to better respond to market opportunities.	
1294	They should evaluate the nature of knowledge boundaries between the partnering firms and how digital boundary objects can be leveraged to span knowledge boundaries.	They need to be cautious not to limit commitment to traditional systems that transfer data across partnering firms. Instead, they need to broaden commitment to information systems that enable partnering firms to establish shared meaning and to represent and negotiate collaboration processes and outcomes.	
Hotho & Champion (2011)			
34	Encouraging innovation requires a managerial mindset characterised by a positive, celebratory attitude towards innovation, combined with tolerance for failure; encouragement of open debate, and a prioritisation of innovation and change over stability and routine (Storey and Salaman, 2005; Storey, 2005).		A3
34	Extrinsic motivation incentives are seen as detrimental to employees' innovativeness and productivity and managers are to focus instead on offering intrinsically motivating "opportunit[ies] to do new things, to be innovative, to [. . .] learn and develop" (Storey, 2005, p. 211).		B8
34	Flexibility, networked flatter structures, self-organising teams and projects, devolved decision making and democratic lines of communication are defining features of organising for knowledge creation (Simon, 2006; Bilton, 2007).		B8
34	Autonomy, task complexity and ownership of work are seen as vital prerequisites for creativity, new		B8

	knowledge creation and innovation (Cummings and Oldham, 1997).		
34	Tactics and arrangements recommended for the effective management of creative people include time, buffering against commercial pressures and client requests, structural separation for explorative innovation, encouragement of risk, a permissible attitude to failure, and slack (Mumford et al., 2002).		B8
34	Feedback and reward should focus on work processes and the process of creative idea generation rather than merely outcomes (Stenmark, 2000).		B8
34	innovative and creative companies are further advised to engage their employees in processes such as adventuring, exploring uncertainty, experimenting, incremental risk taking, conceptual or contextual confronting (Andriopoulos and Lowe, 2000).		B8
35	innovation in SMEs, side by side with management systems, requires an empowerment culture, a transformational leadership style, supportive people management practices and a management mindset predicated on flexibility, responsiveness and space for creativity (O'Regan et al., 2005).		A2 A3
38	Shifting to IP requires strategic shifts at some stage, which involve either experimentation with flexible organisational forms, increase in workforce, a total shift from commercial WFH to IP, or structural arrangements for simultaneous explorative and routine activities.	The expectation that games developers should aim for the creation and eventual exploitation of intellectual property (IP), i.e. own games and consequently devote resources to higher value IP creation through explorative innovation is widely held among industry players, agencies, policy makers, present and future employees, and customers (Christopherson, 2004).	A2
38	"exploitation requires maintenance of existing identity, knowledge and practice, with a certain amount of control and co-ordination, in a dominant design" (Nooteboom, 2008, p. 8).		B6
38	exploration "requires their change, with a loosening of control and co-ordination" (Nooteboom, 2008, p. 8).		
45	Autonomy, task complexity, on the job challenges and supportive leadership (Mumford et al., 2002) are seen as vital for success in knowledge intensive firms, as are other techniques to foster		B8

	intrinsic motivation.		
45	For small creative firms, more engagement with learning and development is recommended (Chaston, 2008).		B8
46	Seemingly more creative work – the focus on exploration and the production of a new, company-owned game, resulted in significantly higher levels of managerial control, and stricter rationalisation of processes.		B8
Helfat & Winter (2011)			
1248	An integrative capability also may serve a dual purpose, such as its use in ambidexterity to manage both new and existing businesses (Tushman and O'Reilly, 1996).	Managerial capabilities may contribute to an organization-level integrative capability in ambidexterity. Integrative capabilities can enable communication and coordination across organizational units and firms. These capabilities can serve an operational purpose, for example by facilitating shared activities that produce economies of scope across stages of production or product lines. Other types of integrative capabilities can make change possible, such as through the coordination of design and manufacture in new product introduction. Thus, an integrative capability may be dynamic or operational, depending on the nature of the capability and its intended use.	B6
1248	O'Reilly and Tushman (2008) observe that ambidexterity relies in part on dynamic capabilities of top managers (Adner and Helfat, 2003) to perform targeted integration of emerging and mature businesses.		C13
He & Wong (2004)			
492	The need for senior managers to become more explicitly aware of the need to allocate resources between explorative versus exploitative innovation.		A1
492	Senior managers may need to consider introducing new metrics to prioritize resource allocation and benchmark performance along the explorative versus exploitative innovation dimensions.	Existing innovation management practices have been largely founded on established typologies with corresponding resource allocation and performance benchmark metrics (e.g., percentage allocation of R&D expenditure into basic versus applied research or product versus process innovation).	
492	The need for senior managers to manage explorative and exploitative innovation simultaneously in "a steady-state perspective," beside "a life cycle perspective" (Winter and Szulanski 2001, p. 731).		A1
492	The need for managers to manage the tension between exploration and exploitation on a continuous basis.	E.g., through the development of "synthesizing capability" to create competitive advantage out of conflicting forces as advocated by Nonaka and Toyama (2002), the adoption of ambidextrous organizational design principles	

		as advocated by Tushman and O'Reilly (1996), or the pursuit of a "semi-structures" design to compete "on the edge of chaos" as suggested by Brown and Eisenhardt (1998).	
Gupta, Smith, & Shalley (2006)			
693	Ambidexterity refers to the synchronous pursuit of both exploration and exploitation via loosely coupled and differentiated subunits or individuals, each of which specializes in either exploration or exploitation.		B6
697	Ambidextrous organization designs are composed of highly differentiated but weakly integrated subunits.	While the exploratory units are small and decentralized, with loose cultures and processes, the exploitation units are larger and more centralized, with tight cultures and processes. Exploratory units succeed by experimenting—by frequently creating small wins and losses (Sitkin, 1992). Because process management tends to drive out experimentation, it must be prevented from migrating into exploratory units and processes. In contrast, exploitation units that succeed by reducing variability and maximizing efficiency and control are an ideal location for the tight coordination associated with process management efforts (2003, p. 252).	B6
698	If one is analyzing exploration and exploitation in multiple, loosely connected domains, the two become orthogonal tasks, and it becomes entirely feasible (and perhaps desirable) to pursue ambidexterity.		B6
698	If one is analyzing exploration and exploitation within a single domain (i.e., an individual OR a subsystem), and exploration and exploitation are rightly conceptualized as the mutually exclusive ends of a continuum, ambidexterity is simply not an option, and the individual or subsystem must resort to punctuated equilibrium.		B7
Gulati & Puranam (2009)			
422	Inconsistencies between formal and informal organization arising from reorganization can help create ambidextrous organizations.	Under some conditions, the informal organization can compensate for the formal organization by motivating a distinct but valuable form of employee behavior that the formal organization does not emphasize, and vice versa—an effect labelled compensatory fit.	B6
423	Reorganizations can help solve the problem of organizational incompatibility and allow the pursuit of jointly desirable dualities when the resulting formal organization and the informal organization each emphasize		B6

	opposing poles of a duality.		
423	An instance of "compensatory" fit between the formal and informal organization, in which they compensate for each other by motivating dissimilar but jointly valuable employee behaviors.	Informal organizational operation can complement the formal structure, causing 'compensatory fit', which can aid ambidexterity. While it is an attractive means to exploit gains from ambidexterity, compensatory fit is not for every company. Our analysis indicates that it can only work when there is a powerful informal organization already in existence, and when the gains from ambidexterity are substantial, in order to avoid inefficiencies arising from having employees work in an inconsistent organizational architecture.	B6
433	An alternative approach to balancing the conflicting organizational demands of dualities lies in combinations of elements of formal and informal organization into a hybrid arrangement.	For instance, Gibson and Birkinshaw (2004) point to such combinations that create contextual ambidexterity, and Brown and Eisenhardt (1997) describe "semistructures," which combine a few key elements that promote exploitation with features that support exploration. Reorganizations, and the resulting organizational inconsistencies they create, can be a means of building such a solution.	B6
Gibson & Birkinshaw (2004)			
210	[Superior business-unit performance], 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.	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.	B7
211	[Ambidexterity is best achieved 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.		
211	Meta-routines for systematizing the creative process for reconciling the inherent tension between efficiency and flexibility that rely on individual employees to make their own choices (Adler et al., 1999).		C13
211	Job enrichment schemes that enable workers to become more innovative and flexible in their routine tasks (for reconciling the inherent tension between efficiency and flexibility that rely on individual employees to make their own choices) (Adler et al., 1999).		B8

212	Worker training and trust in relationships with management as key facilitators (Adler et al, 1999).		B8
212	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.		B8
212	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). 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.	B7
214	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.	
213	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.	Discipline induces members to voluntarily strive to meet all expectations generated by their explicit or implicit commitments.	
213	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.	Stretch is an attribute of context that induces members to voluntarily strive for more, rather than less, ambitious objectives.	
213	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 support.	Support induces members to lend assistance and countenance to others.	
213	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	Trust is an attribute of context that induces members to rely on the commitments of each other.	

	contribute to the establishment of trust.		
215	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.		A3
215	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,p .770).		A1
215	[Adaptability], was achieved […] through "hiring very smart people," setting aggressive but not unrealistic targets, and avoiding too much formalization.		B8
215	Alignment […] was achieved through clear objectives, goal-setting programs, and incentive systems that supported adaptability.		B8
Eisenhardt, Furr, & Bingham (2010)			
1267	To balance between efficiency and flexibility effectively, leaders have to compensate for the natural drift of organizations toward efficiency.	To counter this drift and effectively balance efficiency and flexibility, leaders actively unbalance in favor of flexibility by (1) heuristics-based, "simple rules" processes that allow improvisation; (2) simplification cycling to update structure for new experiences without increasing it; and (3) flexibility-injecting structures such as prototypes and probes.	B6
1265	Moderate structure balances between the competing demands for efficiency and flexibility and thus is likely to be high performing.		
1266	Balancing efficiency and flexibility often occurs by, counterintuitively, unbalanced efforts that favor flexibility.		
1266	A major way to unbalance structure in favor of flexibility is using heuristics to shape key strategic processes (e.g., alliance, acquisition, internationalization, and product development) that are at the heart of dynamic capabilities (Eisenhardt and Martin 2000).	Heuristics are rules of thumb that provide shortcuts in problem solving (Goldstein and Gigerenzer 2002, Tversky and Kahneman 1974). Heuristics emerge as individuals adjust to problem-solving situations in which there is limited time and information (Newell and Simon 1972).	B6
1266	Develop "simple rules strategies" that consist of heuristics for capturing opportunities that flow in key strategic processes like acquisitions and alliances (Bingham and Eisenhardt		

	2010, Eisenhardt and Sull 2001).		
1266	[Executives] use simplification cycling whereby they add to the structure as suggested by their new experiences, but they also purposefully pare back the structure.	[Executives] go through cycles of adding and then eliminating structure rather than continually adding more details to cope with an increasing number of possible contingencies.	B6
1266	A third way to balance by unbalancing is using a flexibility-injecting structure such as temporary assignments (Adler et al. 1999), prototyping rather than planning (Eisenhardt and Tabrizi 1995), alliances rather than relying solely on internal organizational activities (Furr 2009), and redundant organizational units (Bryce et al. 2010).		B6
1267	Highly skilled executives (i.e., those likely to balance effectively) should shun (avoid) high-ambiguity environments where their skill is of little use. Rather, they should actively structure ambiguous environments to their advantage.		C10
1267	In highly unpredictable environments, executives rely on limited structure with flexible adjustments in real time.	The optimal structure diminishes, but with so little structure, improvised action requires extensive attention to figure out what to do, and it often results in errors that waste time (Miner et al. 2001).	C10
1268	When an established firm enters a new market, executives face the challenge of maintaining efficiency in operations within their usually stable, existing markets while concurrently fostering flexibility in their new dynamic market (Gilbert 2006).	Executives manage for efficiency in their existing market and for flexibility in their new one.	C10
1268	When a new firm enters an established market, successful entrepreneurs partially manage as if the market is stable and partially as if it is dynamic.	These entrepreneurs focus on operational efficiencies to generate necessary scale and scope economies quickly, yet they also manage as if the market is dynamic by flexibly adapting to develop an advantageous and unique strategy. Without seeing the environment as stable, entrepreneurs will not develop the efficiency needed to improve reliability. However, without also seeing the environment as dynamic, they will not also develop the flexibility needed to differentiate from rivals.	
1268	Executives should accommodate the coexistence of contradictory cognitive agendas (Brown and Eisenhardt 1997, Smith and Tushman 2005).	Whereas extant theory advocates dual solutions for balancing efficiency and flexibility, we propose solitary solutions to achieve this balance.	A1
1268	Executives can also rely on single,		

	cognitively sophisticated solutions.		
1268	As leaders experience a flow of heterogeneous opportunities within dynamic environments, abstract thinking helps them to create a unified understanding of seemingly diverse experiences (Bingham 2010).	Greater abstraction can reveal similarities across situations that superficially appear different and yet also create room for flexible action within that similar understanding that is nonetheless grounded in the specific context. The former enables some degree of efficiency across the organization, and the latter takes advantage of unexpected events "on the fly."	A1
1269	Another cognitive solution for balancing efficiency and flexibility is cognitive variety.	Cognitive variety refers to the diversity of mental templates for problem solving that exist in an organization. First, cognitive variety creates a greater repertoire of potential solutions derived from diverse templates to apply to a given problem. These templates are individually efficient but collectively flexible. Second, cognitive variety generates more recombinations among these templates, which again relies on the efficiency of individual templates to create collective flexibility. Third, cognitive variety creates tolerance for variety itself, thereby increasing the degree to which novel alternatives are accepted and even expected by organizational members.	A1
1269	A third cognitive solution for achieving the efficiency–flexibility duality is interruption.	Interruption enables flexibility because it creates a pause in the flow of activity that can trigger reassessment and change of direction. Yet interruption simultaneously allows for efficiency because it also enables leaders to avoid wasting time on inappropriate paths.	A1
Dess & Lumpkin (2005)			
147	Firms that want to engage in successful corporate entrepreneurship need to have an entrepreneurial orientation (EO).	Corporate entrepreneurship (CE) has two primary aims: the creation and pursuit of new venture opportunities and strategic renewal. EO refers to the strategy-making practices that businesses use to identify and launch corporate ventures. It represents a frame of mind and a perspective about entrepreneurship that are reflected in a firm's ongoing processes and corporate culture.	A2
148	Autonomy: Independent action by an individual or team aimed at bringing forth a business concept or vision and carrying it through to completion.	Innovativeness, proactiveness, risk-taking, competitive aggressiveness, and autonomy—permeate the decision-making styles and practices of a firm's members. The factors often work together to enhance a firm's entrepreneurial performance. But even some firms that are strong in only a few aspects of EO can be very successful.	A2
148	Innovativeness: A willingness to introduce newness and novelty through experimentation and creative processes aimed at developing new products and services, as well as new processes.		
148	Proactiveness: A forward-looking perspective characteristic of a marketplace leader that has the foresight to seize opportunities in		

	anticipation of future demand.		
148	Competitive aggressiveness: An intense effort to outperform industry rivals. It is characterized by a combative posture or an aggressive response aimed at improving position or overcoming a threat in a competitive marketplace.		
148	Risk-taking: Making decisions and taking action without certain knowledge of probable outcomes; some undertakings may also involve making substantial resource commitments in the process of venturing forward.		
149	Using "skunkworks" to encourage independent thought and action.	To help managers and other employees set aside their usual routines and practices, companies often develop independent work units called "skunkworks." The term is used to represent a work environment that is often physically separate from corporate headquarters and free of the normal job requirements and pressures. Skunkworks are often used to encourage creative thinking and brainstorming about new venture ideas.	A2
150	Reorganizing work units to stimulate entrepreneurial initiatives.	To encourage entrepreneurship, corporations sometimes need to do more than create independent think tanks to help stimulate new ideas. Changes in organizational structure may also be necessary. Established firms with traditional structures often have to break out of such molds in order to remain competitive. For example, the use of teams and autonomous work units have often been shown to improve organizational coordination and control as well as enhance the number of creative solutions through the sharing of members' tacit knowledge.	
150	Technological innovativeness consists primarily of research and engineering efforts aimed at developing new products and processes.		A2
150	Product-market innovativeness includes market research, product design, and innovations in advertising and promotion.		
150	Administrative innovativeness refers to novelty in management systems, control techniques, and organizational structure.		
150	Proactiveness involves not only recognizing changes but also being		A2

	willing to act on those insights ahead of the competition.		
151	Introducing new products or technological capabilities ahead of the competition.		
151	Continuously seeking out new product or service offerings.		
151	Entering markets with drastically lower prices.	Smaller firms often fear the entry of resource-rich large firms into their marketplace. Because the larger firms usually have deep pockets, they can afford to cut prices without being seriously damaged by an extended period of narrow margins.	A2
151	Copying the business practices or techniques of successful competitors.	We've all heard that imitation is the highest form of flattery. But imitation may also be used to take business from competitors. And as long as the idea or practice is not protected by intellectual property laws, it's not illegal.	
152	Business risk-taking involves venturing into the unknown without knowing the probability of success. This is the risk associated with entering untested markets or committing to unproven technologies.		A2
152	Financial risk-taking requires that a company borrow heavily or commit a large portion of its resources in order to grow. Risk is used in this context to refer to the risk/return tradeoff that is common in financial analysis.		
152	Personal risk-taking refers to the risks that an executive assumes in taking a stand in favor of a strategic course of action. Executives who take such risks stand to influence the course of their whole company and their decisions can also have significant implications for their careers.		
152	Researching and assessing risk factors to minimize uncertainty.		
152	Using tried-and-true practices and techniques that have worked in other domains.		
Colarelli & DeMartino (2006)			
475	Radical innovation (RI) is one such pathway, which results in organically driven growth through the creation of whole new lines of business that bring new to the world performance features to the market and may result in the	To escape the intense competition of today's global economy, large established organizations seek growth options beyond conventional new product development that leads to incremental	B6

	creation of entirely new markets.	changes in current product lines.	
493	Senior management's perceptions of the appropriate degree of business unit ambidexterity—the ability of business unit managers to simultaneously advance radical innovation initiatives while conducting daily operational functions—impacts the RI system's organizational structure.		A2
493	each division has a radical innovation infrastructure of its own and is therefore responsible for investing in high-risk, high-uncertainty projects that most operating units in most large established firms ignore.		B6
493	any individual in the company identified as having the potential to move into general management, either at the divisional or corporate level, is expected to manage ambidextrously—that is, both for today and the future.		A2
493	The company has invested heavily in training all general managers to develop the language distinctions for incremental, near-term versus more radical innovation and has put in place a management system that supports this behavior.	In every other sample company, interviewees declare their belief that some individuals are suited for the higher-uncertainty activities associated with radical innovation and that others are better suited for operational challenges.	B8
494	an effective idea generator could improve the number and quality of RI ideas evaluated by the company, but the ability of the firm to incubate and then to grow these initiatives depended on successful interfaces between the idea-generating capability and existing operating units, thereby confining the idea generator to promote opportunities that were aligned with current business units' markets and business models.		B6
Cao, Gedajlovic, & Zhang (2009)			
792	A close balance of exploration and exploitation (i.e., BD) will enhance firm performance through the mitigation of risks stemming from the over-commitment to one or the other.	Viewing exploration and exploitation as mutually exclusive (balance dimension) aids in minimizing the risk of neglecting one dimensions over the other.	B6

792	High combined levels of exploration and exploitation (i.e., high CD) enhance firm performance through different causal mechanisms—the development and leverage of complementary resources between exploratory and exploitative processes.	High levels of exploration that simultaneously coexist with high levels of exploitation (combined dimension) lead to higher performance through the creation and leverage of complementary resources between exploration and exploitation processes.	B6
792	A synergistic effect of high concurrent levels of BD and CD that enhances firm performance through a third mechanism—by allowing existing knowledge and resources to be more fully employed to acquire new capabilities, and also by permitting new knowledge and resources to be more fully integrated into the existing pool of competencies.		B6
793	For more resource-constrained firms, the trade-off view appears quite relevant and appropriate.	Small firms with little resources benefit from a trade-off, a balance, between exploration and exploitation. When there are enough internal and external resources, exploration and exploitation may not be conceptualized as mutually exclusive.	C9
793	In terms of performance, a close balance of exploitation and exploration is more important for smaller firms.		
793	Trade-offs between exploitation and exploration may be surmounted provided a firm has access to sufficient internal or externally located resources.		
793	Managers in resource-constrained contexts may benefit from a focus on managing trade-offs between exploration and exploitation demands.		
793	The attainment of high CD is positively associated with performance among larger firms and those operating in more munificent environments.	Large firms operating in environments which provide sufficient resources, benefit from simultaneously combining high levels of exploration and exploitation respectively.	C9
793	For firms that have access to sufficient resources, the simultaneous pursuit of exploration and exploitation is both possible and desirable.		
Benner & Tushman (2003)			
247	Ambidextrous organizations are composed of multiple tightly coupled subunits that are themselves loosely coupled with each other.		B6
247	Within subunits the tasks, culture, individuals, and organizational arrangements are consistent, but across subunits tasks and cultures are inconsistent and loosely coupled.		B6

247	Strategic integration—the ability to drive innovation streams and take advantage of contrasting organizational capabilities—occurs at the senior team level of analysis.	B6
247	Ambidextrous organizational designs are composed of highly differentiated but weakly integrated subunits.	
247	While the exploratory units are small and decentralized, with loose cultures and processes, the exploitation units are larger and more centralized, with tight cultures and processes.	B6
247	These contrasting, inconsistent units must be physically and culturally separated from one another, have different measurement and incentives, and have distinct managerial teams (Bradach, 1997; Nonaka, 1988, 1991; Sutcliffe et al., 2000; Tushman & O'Reilly, 1997).	B6
248	These highly differentiated but loosely coupled subsystems must be strategically integrated by the senior team.	B6
248	Such strategic linkage is anchored by common aspiration levels and a senior team that both provides slack to the experimental subunits and holds the differentiated units to fundamentally different selection and search constraints (Levinthal & March, 1993; Rotemberg & Saloner, 2000).	
248	To be effective, ambidextrous senior teams must develop processes for establishing new, forward-looking cognitive models for exploration units, while allowing backward-looking experiential learning to rapidly unfold for exploitation units (Gavetti & Levinthal, 2000; Louis & Sutton, 1989).	
248	To create dual organizational structures, senior teams must develop techniques that permit them to be consistently inconsistent as they steer a balance between the need to be small and large, centralized and decentralized, and focused both on the short term and long term, simultaneously (Gavetti & Levinthal, 2000; Hedberg et al., 1976; Weick, 1995).	B6

248	These internally inconsistent operating modes must be strategically linked by the senior team through their aspirations and actions and through a limited set of core values (Hambrick, Nadler, & Tushman, 1998).		
Beckman (2006)			
744	Hypothesis supported: Founding teams with common prior company affiliations are likely to engage in exploitative behaviors.	Founding team members with common prior company affiliations have a shared language, culture, and narratives. A shared language suggests a common perspective and trustworthiness. When founding teams' members share some common prior company affiliations, they share routines that aid their firms in "the exploitation of old certainties". Joint work experience increases trust, common goals, and mutual understandings, thereby decreasing the time inefficiencies of learning new roles and expectations.	A4
744	Hypothesis supported: Founding teams with diverse prior company affiliations are likely to engage in explorative behaviors.	Innovators develop routines and competencies that are different from those of other organizations, and teams with diverse networks are more likely to engage in innovative activities. Sharing broadly based market knowledge will encourage innovation and the development of new technologies more than a discussion of narrow firm-specific knowledge because team members with a variety of former company affiliations have different understandings about technical procedures, customer requirements, productive organizational cultures, and appropriate routines and processes.	A4
745	Hypothesis supported: Firms whose founding teams have both common and diverse prior company affiliations will have higher levels of performance.	Teams with both common and diverse prior company affiliations will have the shared understandings to efficiently transmit knowledge and the unique perspectives to support innovation and change.	A4
Andriopoulos & Lewis (2009)			
703	Integration entailed cultivating a paradoxical vision that accommodates the dual emphases.	To handle the paradox/tension of strategic intent, meaning the reconciling of profit (exploitation) and breakthrough (exploration), integration can be used by creating a paradoxical vision.	A2
703	Such as vision calls for firms to be highly profitable and highly idealistic.		
703	Such an explicit, paradoxical vision helped actors at all levels value the paradox.		
704	Supportive communications help avoid paradoxical visions being interpreted as oversimplified or unrealistic.		

704	Reiteration may also build trust and avoid mixed messages, such as employees perceiving cost controls as assuming priority over innovation (Dougherty 1996).		
704	Differentiation practices target distinctive efforts at each strategic goal.	To handle the paradox of strategic intent, meaning the reconciling of profit (exploitation) and breakthrough (exploration), differentiation of either exploratory or exploitative projects can be used.	B6
704	Specifically, these firms diversify their portfolios with more routine, profitable projects and high-risk, breakthrough projects.		
704	To aid exploitation, the firms sought projects to leverage and hone their existing specializations and knowledge.		
704	Exploratory projects often require more proactive searches.		
704	Informants described widely varying means, such as collaborating with clients and/or suppliers in joint ventures or working for potential equity with startup ventures.		
705	Integrative approaches were evident in descriptions of purposeful improvisation.	To handle the paradox of customer orientation, meaning the coupling of tight needs and constraints (exploitation) and loose possibilities and freedom (exploration), integrative approaches can be used.	B6
705	Project work seemed to stress exploiting existing routines and knowledge, while exploring within and pushing project boundaries.		
705	Differentiation seemed to entail temporal separation, splitting the tensions by iterating between project constraints and freedom.	To handle the paradox of customer orientation, meaning the coupling of tight needs and constraints (exploitation) and loose possibilities and freedom (exploration), differentiation in form of temporal separation can be used.	B6
705	Most often, informants described starting a project by listening intently to the client, seeking to "walk in their shoes" to fully grasp project goals.		
705	Teams then begin to pull away from initial constraints, most often using brainstorming to explore new domains.		
706	Integration fostered both/and thinking.	To handle the paradox of personal drivers, meaning the coupling of discipline (exploitation) and passion (exploration), entails the cultivation of paradoxical work identities.	A1
706	Integration entailed cultivating paradoxical work identities.		B6
706	Designers, engineers, and managers stressed the importance of socialization - from hiring to mentoring to ongoing reviews - in helping firm employees identify themselves as "practical		

	artists".		
706	Differentiation compartmentalized opportunities for routine and nonroutine work.	To handle the paradox of personal drivers, meaning the coupling of discipline (exploitation) and passion (exploration), a hybrid of temporal and spatial differentiation can be used.	B6
707	A hybrid of temporal and spatial differentiation appeared to help manage the paradox of personal drivers.		
707	Varying the nature of work at different times - during different projects and project phases - enabled knowledge workers to leverage their discipline and their passion.		
707	Distinct roles enabled spatial separation as different individual or units focused on either the discipline of execution, budgeting, and other administrative elements, whereas others trapped into the passion fostered by experimentation and ideation.		
707	Managing the paradoxes of strategic intent, customer orientation, and personal drivers involved a mix of integration and differentiation tactics.		B6
708	By managing innovation across levels, firms reduce the threat of mixed messages.	The strategic intent paradox appears predominant at the firm level, whereas customer orientation particularly affects efforts within projects, and personal drivers appear most impactful on knowledge workers themselves.	A2
708	By managing innovation across levels, management also becomes the responsibility of actors throughout the firm.	Executives set the context, providing strategic leadership and allocating resources that determine their firm's portfolio of projects. Directors and project leaders, in turn, guide specific projects, ensuring adherence to clear development processes and encouraging improvisation as well as iterations between work modes. Finally, knowledge workers themselves choose when and how to best apply their discipline and passion to enhance product development.	
708	Blending integration and differentiation fosters virtuous cycles which stem from embracing tensions, valuing their synergies, and their distinctions.	Integration tactics accentuate the importance of both poles of exploitation-exploration tensions. These social and cultural approaches (e.g., organizational vision, project norms for improvisation, and socialized identities as practical artists) enable a paradoxical mindset. However, differentiation is also vital. Clearly focusing actions (e.g., on projects targeted at different strategies, at constraints or freedom during project phases, and with segregated work modes) helps maximize the distinct benefits of opposing poles.	B6

708	The final factor that may sustain ambidexterity is the learning synergies enabled by exploitation and exploration efforts.	The interplay between exploration and exploitation enables absorptive capacity (a firm's ability to recognize, assimilate, and apply new knowledge). Exploitative efforts help transform knowledge into commercial ends, but without exploration a firm's stock of knowledge will wane (e.g., being utilized repeatedly until a firm is stuck in a specific product or industry niche). Likewise, exploratory efforts help continuously renew and expand a firm's knowledge base, but without exploitation that knowledge may not be utilized fully (e.g., recombined in varying ways across projects or product iterations). In essence, the two modes of innovation are mutually reinforcing.	C12
Ambos, Mäkelä, Birkinshaw, & d'Este (2008)			
1430	Hypothesis supported: Research projects that take place in universities with a specialized technology transfer office (TTO), have a higher likelihood of a commercial output from a project.	Research institutions typically respond to the challenge of achieving two disparate goals - academic and commercial outcomes - simultaneously by creating dual structures. A typical way of addressing the ambidexterity problem is to focus on scientific excellence within the traditional academic part of the organization, and on commercial aims through a separate entity such as TTO.	A3
1431	Hypothesis supported: The higher the scientific excellence of the academic department where the research project takes place, the higher the likelihood of a commercial output from the project.		
1432	Hypothesis supported: Compared to projects led by professors, projects led by lower-ranking academics will have a higher likelihood of a commercial output.	Projects with younger, less senior, and higher-cited principal investigators produce the highest proportion of commercial outputs.	A3
1432	Hypothesis supported: The less time the principal investigator has spent in academia, the higher the likelihood of a commercial output from the project.		
1434	Hypothesis supported: The higher the principal investigator's belief in the compatibility between industry engagement and academic career, the stronger the relationship between the principal investigator's interest in applied research and the likelihood of commercial output from the projects.	Faculty who are both motivated to pursue commercial activity and who believe it will not harm their academic career is more likely to generate commercial outputs.	A3
1442	More subtly, [universities] can make it clear that the development of commercial outputs is a legitimate activity, and that it does not compromise a researcher's ability to further his or her academic career.	Our results make it a key priority for universities to seek and promote young ambidextrous high achievers, not only to benefit from their own research but also because their success will encourage others to seek achievement in both domains.	B8
1443	Universities might benefit from providing incentives, support and training for some of their established research who are locked into academic		B8

	research trajectories.		
Adler, Goldoftas, & Levine (1999)			
43	both workers and suppliers contributed to nonroutine tasks while they worked in routine production.		C13
43	routine and nonroutine tasks were separated temporally, and workers switched sequentially between them.		
43	novel forms of organizational partitioning enabled differentiated subunits to work in parallel on routine and nonroutine tasks.		
43	NUMMI's success with these four mechanisms depended on several features of the broader organizational context, most notably training, trust, and leadership.	*NUMMI = Toyota subsidiary	B7
44	organizations should adopt a mechanistic form if their task is simple and stable and their goal is efficiency.	Contingency theory argues that organizations will be more effective if they are designed to fit the nature of their primary task.	B6
44	[organizations] should adopt an organic form if their task is complex and changing and their goal is therefore flexibility.		
45	Metaroutines systematize the creative process.	Metaroutines shift the tradeoff by transforming nonroutine into more-routine tasks; but organizations can also become more ambidextrous by developing their innovativeness in nonroutine tasks without impairing their efficiency in routine tasks. (45) --> for NUMMI examples see p. 50	C13
50	Meatroutines: Standardized procedures for changing existing routines and for creating new ones.		
45	Job enrichment enables workers to become more innovative and flexible even in the course of their routine tasks.	In a TQM [Total Quality Management] environment, production workers doing their regular production work tasks can be attentive simultaneously to the efficient implementation of routine production procedures and to the nonroutine task of identifying improvement opportunities. These workers may not sit down to document a suggestion until the shift is over, but much of the requisite discovery and analysis can be done on the job. (46) --> for NUMMI examples see p. 50	B8
50	Enrichment: Add nonroutine tasks to routine production tasks.		
45	Switching differentiates roles for dealing with the two kinds of tasks, thus allowing workers time to focus on each.	Work can be organized so that people switch sequentially between the two types of tasks rather than attempting to do them both simultaneously. As compared to enrichment, switching allows greater focus and reduces the risk of confusion. Such switching can be supported by "parallel" organizational structures such as quality circles. These structures enable	B7
50	Switching: Separate times for routine and nonroutine tasks and switch		

	employees between them sequentially.	people to move back and forth between a bureaucratic structure for the routine tasks and a more organic structure for the nonroutine tasks. (46) --> for NUMMI examples see p. 50	
45	And partitioning differentiates structures for dealing with each kind of role, and the resulting specialization permits subunits to refine their capabilities in each activity, and permits routine and nonroutine activities to be carried out simultaneously in parallel.	Ambidexterity can be supported on an even more macroscopic scale if the organization as a whole partitions itself to allow some subunits to specialize in routine tasks while other subunits specialize in nonroutine tasks. (46) --> for NUMMI examples see p. 50	B6
50	Partitioning: Create subuntis that specialize in routine or in nonroutine tasks.		
48	a decentralized structure (read: partitioning) in which headquarters functions as a facilitator rather than as a "checker and controller,".	Distinctive values, culture, and leadership are essential contextual conditions for ambidexterity. (in Tushman & O'Reilly, 1997)	B6
48	a common, underlying layer of strong culture and vision which is complemented by another layer of culture that is differentiated between evolutionary and revolutionary parts of the organization (read: partitioning) or between the corresponding phases of activity (read: switching).		A2
48	supportive leaders and flexible managers.		A3
49	Standardized problem-solving procedures facilitated continuous improvement efforts in regular production.	The metaroutines of standardized problem-solving, changeover process procedures, and the reflection-review process allowed NUMMI to significantly routinize otherwise nonroutine tasks associated with changeovers, and thereby to improve efficiency without impairing flexibility and vice versa.	C13
49	Accumulated documentation of changeover experiences facilitated the work of the Pilot Team and guided interactions with suppliers.		
51	And a structured reflection-review procedure facilitated efforts to improve changeover management from project to project.		
61	NUMMI avoided resistance to the modification of routines with a strong culture of kaizen, rewards for innovation, and strong leadership to reinforce that culture.		
61	Instead of staff methods engineers imposing formalized standards on core employees, workers participated actively in defining and refining		

	standardized work sheets.		
61	Instead of staff experts imposing changeover management procedures, the entire organization used the reflection-review process to progressively define and refine the procedures.		
62	when workers participated in the effort to routinize their core tasks, participation in this activity increased autonomy and variety.		
62	Routinization was not imposed on workers but presented as the path to competitiveness— and job security—in the world of high volume, mass production.		
51	Continuous improvement was defined as a key additional responsibility of production workers, indeed of all NUMMI personnel.	NUMMI enriched routine production work, encouraging and training line employees and suppliers to stay alert for improvement opportunities.	B8
51	Workers were encouraged to pull the "andon cord" to signal problems in their work and stop the line if necessary.		
51	NUMMI's managers put a premium on mindfulness in the conduct of routine activities.		
51	Workers' suggestions were particularly important during the acceleration of production on the new model: here workers were actively mobilized to identify problems and propose solutions to help the acceleration.		
51	Instead of leaving job design to a methods engineering department—NUMMI had no such department—workers were actively involved in the process of job design and redesign through the "standardized work" process.		
51	NUMMI mobilized suppliers' product design capabilities, and expected—and provided support for—continuous improvement and innovation in both the suppliers' products and their internal processes.		

62	Enriching workers' jobs in mass production activities such as auto assembly will require inefficient levels of training, and that the job enlargement commonly recommended to accompany job enrichment will weaken the discipline required for efficiency in routine core tasks. NUMMI overcame the former impediment by a complementary investment in support for worker kaizen activities.		
62	support was in the form of kaizen training, job rotation to broaden workers' understanding of the production system, engineering support for the timely testing and implementation of workers' suggestions, and strong management support for worker suggestions.		
62	impediment to enrichment as a tradeoff-shifting mechanism is the loss of discipline in the implementation of standardized procedures for routine tasks that comes with excessive lengthening of cycle times. NUMMI avoided this problem by keeping the cycle times for core production tasks very short and putting great stress on the value of standardized sequences of motions in assuring high productivity and quality.		
62	additional risk of opportunism created when enrichment reduces task programmability. NUMMI appears to have avoided this class of problems through the establishment of a high level of mutual trust between workers and managers: trust in competence and goal congruence.		
51	Workers improvement ideas were developed not only on-the- job during regular production but also in off-line Quality Circle meetings.	Workers switched easily between routine production roles and nonroutine kaizen roles in quality circles, in pilot runs, and in temporary assignments to the Pilot Team.	B7
51	Workers participated in pilot production runs, where they helped identify problems and improvement opportunities.		
51	And workers were also given temporary assignments to the Pilot Team.		
62	some theory predicts that allowing employees to switch roles sequentially will not significantly shift the		

	efficiency/flexibility tradeoff since workers can hardly function as respected problem-solvers in organically structured quality circles and improvement teams if they are treated as closely monitored proto-robots in their repetitive jobs during the rest of the week. NUMMI appears to have overcome this impediment by an extensive set of policies and practices that encouraged innovation and employee involvement, including a participative leadership style in routine production, worker involvement in defining and refining work procedures, a team-based work design, a commitment to employment security, a union that ensured management kept its commitments, and gainsharing.		
51	NUMMI shifted the tradeoff by creating new partitions, reallocating tasks across partitions, eliminating dysfunctional partitions, and improving coordination and integration between partitions.	NUMMI used partitioning more effectively than traditional approaches allowed: it created a new, relatively organic partition, the Pilot Team, devoted to the nonroutine tasks associated with changeovers; it allocated tasks more effectively across existing make-up partitions; it eliminated dysfunctional partitions such as the methods engineering department; and it greatly improved coordination and integration between partitions.	B6
51	The Pilot Team was a novel specialized unit, working alongside an engineering changeover team, responsible for designing the work process for the new model and for training workers for their new assignments.		
51	Responsibilities were reallocated across existing partitions, in particular through job enrichment for workers and more active involvement of suppliers.		
51	The traditional specialized methods engineering department was eliminated, and work methods were determined by workers on the line.		
51	Various partitioned units—within the plant, within other parts of the corporation, and suppliers—interacted intensively to assure effective mutual adjustment.		
62	the Pilot Team was drawn from among the production Team Leaders and the assignment was only temporary.	Some theory is skeptical of the partitioning mechanism's ability to shift the tradeoff because the creation of new subunits typically creates additional management overhead for coordinating and resolving conflicts between subunits. Several factors reduced the coordination and integration costs associated with the creation of the Pilot Team.	
62	coordination costs were reduced by ensuring that the Pilot Team worked in close interaction with the line organization all through the changeover process.		

62	The Pilot Team was matrixed into line management and it was located in the plant. Very early in the preparation process, line workers identified for the Pilot Team problems with the current process that they wanted to see fixed. Later in the process, during off-line training and on-line pilots, line workers contributed kaizen ideas.		
51	Training was critical. If people lack the knowledge, skills, and abilities required for the effective implementation of the four basic mechanisms, the tradeoff cannot be shifted.	One key feature of NUMMI's context: Training	B8
51	NUMMI invested far more than Big Three plants in worker training.		
51	They also invested more than the Big Three in supplier "technical support."		
51	NUMMI's culture placed a high premium on consistency, on "walking the talk."	Lack of consistency trust—i.e., lack of trust that the other party will do what they said they would —can undermine support for metaroutinization and for the other three mechanisms.	B8
51	Top management commitment to this value was enacted in the use of cross-level forums in which breakdowns of consistency could be surfaced and dealt with under norms of "fact-based management" rather hidden by parochial politics.		
51	The credibility of this commitment was buttressed by strong union voice.		
51	NUMMI's extensive training investments assured high levels of worker competence.	In many organizations managers and subordinates distrust each other's competence to fulfill their commitments.	B8
51	NUMMI's extensive technical support for suppliers motivated high levels of trust in supplier competence.		
51	NUMMI thus moved from inspecting incoming parts to certifying the ability of the suppliers to produce parts that met specification.		
52	And management competence was buttressed by high levels of investment in training for first-level managers and a policy of promotion from within.		
52	At NUMMI, "teamwork" was a core value expressed not only in the organization of workers into small production teams, but also in the ethos governing relations between	All four mechanisms can easily be undermined by lack of trust in goal congruence. Lack of congruence trust is commonly encountered in the conflict between horizontally differentiated subunits within the organization, between	B8

	departments and vertical layers, as well as in labor and supplier relations.	vertical layers in the organization, and between suppliers and customers.	
52	Divisive political motives were dampened by top management's commitment to "fact-based management."		
52	The union's voice in the governance of the plant strengthened workers' confidence that management decisions would reflect common goals and not only corporate goals.		

Appendix C: Categorization of the text modules selected from practitioner literature

Page	Text Module	Explanation	Code
Tushman, Smith, & Binns (2011)			
76	Firms thrive when senior managers embrace the tension between new and old and foster a state of constant creative conflict at the top.	The problem is that although most executives acknowledge the need to explore new businesses and markets, they almost always bow to the more-pressing claims of the core business, especially when times are hard.	A1
76	Engage the senior team around a forward-looking strategic aspiration.	A broader identity gives permission to engage in opposing strategies - to exploit existing products and services while simultaneously exploring new offerings and business models.	A2
77	Create an emotionally compelling identity that encompasses a firm's existing products and services.		
77	Create an identity that is broad enough to be aspirational.		
77	Create an identity that does not limit the firm to customer groups or solutions that may be disrupted in the future.		
76	Explicitly hold the tension between the demands of innovation units and the core business at the top of the organization.	The problem is that senior management time is dominated by operational problem-solving, with only occasional flashes of interest in the future. The tension gets resolved at lower levels, and innovation usually loses out.	A1
78	[…] decision about the firm's present and future must be made at the senior	This can be done by two equally successful but vastly different approaches: hub and spoke and	A1

	executive level.	ring-team model.	
78	Create a hub and spoke team.	The CEO sits at the center of the wheel surrounded by business unit leaders, each of whom confers and communicates only with the CEO, not with one another. The CEO manages each spoke of the wheel separately, and each business unit relies heavily on the leader. Many hub-and-spoke teams manage through an inner circle of two or three individuals. Unit leaders interact extensively with the inner circle to learn, advocate, and report progress, but they rarely deal with other unit leaders. Cross-team meetings serve primarily as informational updates. Resolution between exploitative and exploratory strategies takes place in the senior leader's office.	A4
78-79	Create a ring-team model.	A ring-team model brings unit leaders together in the CEO's circle. Decisions are made collectively by the senior team about how to allocate resources and make trade-offs between the present and the future. In most ring teams, the business unit leaders are compensated on the basis of total company performance—not individual P&Ls—and there is a clear focus on the long-term drivers of growth. Because team members make decisions as a group, higher degrees of collaboration are required. Extensive communication is a must, as is a leader who is able to deal with the complex dynamics associated with juggling contrasting time frames. Ring team members share an obligation to debate and express dissent over critical issues. They are expected to identify problems and call one another out in a transparent manner. The goal is not to reach a compromise, but rather to discover together the best way to advance the company's agenda in both the short and longer term.	A4
76	Embrace inconsistency by maintaining multiple and often conflicting strategic agendas.	In many companies, innovation units find themselves measured against the performance standards of the core business. This puts the innovation unit at a disadvantage as it struggles to match up to a well-established business that has proven itself.	A1
79	Continually shift the resources (financial investment, talent) between core businesses and innovation units.	To not limit the value the resources offer to a firm.	
80	Supporting core businesses and innovation unite requires leaders to be consistently inconsistent.	Successful top teams move resources between businesses as shifting needs demand.	
Tushman & O'Reilly (1996)			

11	[Leaders need] to be able to compete successfully by both increasing the alignment or fit among strategy, structure, culture, and processes, while simultaneously preparing for the inevitable revolutions required by discontinuous environmental change.	Long-term success is marked by increasing alignment among strategy, structure, people, and culture through incremental or evolutionarily change punctuated by discontinuous or revolutionary change that requires a simultaneous shift in strategy, structure, people, and culture.	A1
13	Those who fit the Apple values and subscribed to the cultural norms stayed.	Need for a culture that is based on the shared expectations among employees about innovation, commitment, and speed.	A2
13	Success flowed not only from having a new product with desirable features, but also from the ability of the organization to design, manufacture, market, and distribute the new PC.	Congruence among the elements of the organization is a key to high performance across industries.	A1
18	Using feedback from the market to continually refine the organization to get better and better at accomplishing its mission.	Successful companies learn what works well and incorporate this into their operations.	C13
22	[Nordstrom's] competitive advantage is […] in a culture shared throughout the organization that provides a level of service that competitors have found difficult to imitate.		A2
22	Nordstrom relies […] on its culture, which is characterized by a set of norms and values that provide for a social control system.	The social control system is used to coordinate activities in the face of the need for change and allowed to meet the nonstandard requirements.	
25	[…] keep units small and autonomous so that employees feel a sense of ownership and are responsible for their own results.	This encourages a culture of autonomy and risk taking that could not exist in a large, centralized organization.	B6
25	Reward systems are designed to be appropriate to the nature of the business and emphasize results and risk tasking.	There is a tolerance for certain types of failures (e.g. managers that take informed risks).	B8
26	An important part of the solution is massive decentralization of decision making, but with consistency attained through individual accountability, information sharing, and strong financial control.	A loss of synergy is prevented by the use of social control.	A2
26	[…] reliance on strong social control.		
26	[Firms] are simultaneously tight and loose.	They are tight in that the corporate culture in each is broadly shared and emphasizes norms critical for innovation such as openness, autonomy, initiative, and risk taking. The culture is loose in that the manner in which these common values are expressed varies according to the type of innovation required.	A2

26	A common overall culture is the glue that holds these companies together.	The key is a reliance on a strong, widely shared corporate culture to promote integration across the company and to encourage identification and sharing of information and resources. The culture also provides consistency and promotes trust and predictability.	
26	Yet, at the same time, individual units entertain widely varying subcultures appropriate to their particular business.		
27	[The tight-loose aspect of the culture] is supported by a common vision and by supportive leaders who both encourage the culture and know enough to allow appropriate variations to occur across business units.	Promote both local autonomy and risk taking and ensure local responsibility and accountability through strong, consistent financial control systems.	
27	Managers who don't deliver are replaced.	In return of the autonomy the managers are granted, there are strong expectation of performance.	A3
27	[…] need for lower level managers to come up with solutions and encouraging reasonable failures.	Often, these leaders are low-keyed but embody the culture and act as visible symbols of it.	
27	As a group the senior team continually reinforces the core values of autonomy, teamwork, initiative, accountability, and innovation.	The senior teams ensures that the organization avoids becoming arrogant and remains willing to learn from its competitors.	
27	Leaders who venerate the past but are willing to change continuously to meet the future.		
27	Ambidextrous organizations learn by the same mechanism that sometimes kills successful firms: variation, selection, and retention.	They promote variation through strong efforts to decentralize, to eliminate bureaucracy, to encourage individual autonomy and accountability, and to experiment and take risks. These firms also select "winners" in markets and technologies by staying close to their customers, by being quick to respond to market signals, and by having clear mechanisms to "kill" products and projects. Finally, technologies, products, markets, and even senior managers are retained by the market.	A2
O'Reilly, Tushman, & Harreld (2009)			
88	Each EBO leader reports to a business unit head […], but also reports to the senior executive responsible for new growth opportunities.	Dual reporting provides corporate oversight to ensure that milestones are being met and resources allocated as well as provides for collaboration across businesses and the opportunity to quickly resolve issues as they arise.	A2
89	[…] twice a year there is a formal process in which ideas are solicited from both within the company […] and from other outside […].	These new ideas/suggestions help identify disruptive technologies, new business models, and attractive new markets. Variation: Establishing a new EBO/a new idea.	A2

89	[…] socialize promising ideas among senior executives and customers […].	To determine and gain acceptance of the new and promising ideas.	
89	[…] the strategy group then does a "deep dive" to properly vet the market opportunity.	Assessment of the new idea.	
89	[Harreld and the corporate strategy group] meet with [the EBO] monthly to review progress, refine strategy, and help them get the right people and alignment to ensure execution.	Identification, together with the managers of EBO, of what is going well, what not and what to try next. Selection: Running the experiment	A2
90	Active and frequent senior-level sponsorship.	Active support from the senior management with frequent meetings.	
90	Dedicated A-Team Leadership.	Experienced leaders, who have built big businesses, have learned a lot along the way, who understand IBM, and are comfortable knowing what to change and what to test. New leaders are selected and trained in the skills needed for the emerging opportunities.	
91	Disciplined mechanisms for cross-company alignment.	Ensure that the line businesses provide the requisite support to address business opportunities across the company.	
91	Resources fenced - and monitored - to avoid premature cuts.	To allocate funds for a new initiative and to ensure that the funds are spent according to plan.	
91	Actions linked to critical milestones.	Need to carefully define and monitor progress in meeting milestones.	
92	Quick start, quick stop.	If the new business doesn't meet its milestones and connect with customers, it needs to be stopped or morphed into something else.	
90	Manage a portfolio of related experiments and projects.	Leadership principles for EBOs	A2
90	Initiate activities that are directionally correct.		
90	Play major communication role inside and outside.		
90	Establish and communicate a clear vision.		
90	Create an extended team for advice and counsel.		
90	Balance opposing factors to imagine future possibilities that are currently unrecognized market needs.		
92	Create a set of criteria to ascertain when an EBO would be graduated a	The criteria include a strong leadership in place, a clearly articulated strategy for profit contribution, early market success, and a proven	A2

	growth business.	customer value proposition.	
94	The combination of a clear strategic intent, guaranteed funding, senior-level sponsorship, entrepreneurial leaders, and an aligned organization were required for the venture to succeed.	Retention: Moving from a future business to a growth business.	
95	[The ability of senior leaders to reconfigure assets to compete in emerging and mature businesses, to be ambidextrous,] must be repeatable.	The underlying processes [of being ambidextrous] are explicitly learned and managed by senior leaders. It is the set of routines and processes orchestrated by the senior team that defines ambidexterity as dynamic capability.	A13
O'Reilly & Tushman (2011)			
6	First, [senior managers] must be able to accurately sense changes in their competitive environment, including potential shifts in technology, competition, customers, and regulation.		A1
6	Second, [senior managers] must be able to act on these opportunities and threats; to be able to seize them reconfiguring both tangible and intangible assets to meet new challenges.		
17	[…] leaders within the organization are able to make the difficult choices required to reconfigure assets to promote exploratory ventures.		
6	As a dynamic capability, ambidexterity embodies a complex set of routines including decentralization, differentiation, targeted integration, and the ability of senior leadership to orchestrate the complex trade-offs that the simultaneous pursuit of exploration and exploitation requires.		C13
9	A compelling strategic intent that intellectually justifies the importance of both exploration and exploitation.	A compelling strategic intent ensures that short-term gains from explorative activities are not substituted by profitable exploitative activities.	A2
9	An articulation of a common vision and values that provide for a common identity across the exppploitative and exploratory units.	A common vision and values lead to a common identity to promote trust, cooperation, and a long-term perspective.	
9	A senior team that explicitly owns the unit's strategy of exploration and exploitation; there is a common-fate reward system; and the strategy is communicated relentlessly.	A lack of consensus leads to a resistance to effort, a diminishing cooperation, increased competition for resources, and a slowing-down of execution. The absence of a common-fate reward system and a lack of relentless communication can undermine cooperation and	

		encourage unproductive conflict.	
9	Separate but aligned organizational architectures (business models, structure, incentives, metrics, and cultures) for the exploratory and exploitative units and targeted integration at both senior and tactical levels to properly leverage organizational assets.		B6
9	The ability of the senior leadership to tolerate and resolve the tensions arising from separate alignments.		A1
O'Reilly & Tushman (2004)			
76	[ambidextrous organizations] manage organizational separation through a tightly integrated senior team.	Ambidextrous organizations separate their new, exploratory units from their traditional, exploitative ones, allowing for different processes, structures, and cultures; at the same time, they maintain tight links across units at the senior executive level.	B3
75	Create organizationally distinct units that are tightly integrated at the senior executive level.		
81	[…] ambidextrous organizations need ambidextrous senior teams and managers […].	Ambidextrous managers means executives who have the ability to understand and be sensitive to the needs of very different kinds of businesses. It essential to combine the attributes of rigorous cost cutters and free-thinking entrepreneurs while maintaining the objectivity required to make difficult trade-offs.	A3
81	[…] a company's senior team must be committed to operating ambidextrously even if its members aren't ambidextrous themselves.	Resistance at the top levels of an organization can't be tolerated. The leaders who show resistance towards ambidexterity need to be dismissed.	
81	[…] a clear and compelling vision, relentlessly communicated by a company's senior team, is crucial in building ambidextrous designs.	These aspirations provide an overarching goal that permits exploitation and exploration to coexist and underscores the strategic necessity of ambidexterity and the benefits for all employees.	A2
80	The strategic intent in exploitative business is to improve cost and profit, while in explorative unit it is to enhance innovation and growth.		B6
80	The critical tasks in exploitative businesses are operations, efficiency, and incremental innovation, while in explorative businesses they are adaptability, new products, and breakthrough (architectural or discontinuous) innovation.		
80	The competencies in exploitative business are operational, while in explorative businesses they are		

	entrepreneurial.		
80	The structure in exploitative businesses is formal and mechanistic, while in explorative businesses it is adaptive and loose.		
80	Exploitative businesses control margins and reward productivity, while explorative units control milestones and reward growth.		
80	The culture in exploitative businesses focusses on efficiency, low risk, quality, and customers, while in explorative businesses it focusses on risk taking, speed, flexibility, and experimentation.		
80	The leadership role in exploitative businesses is authoritative and top down, while in explorative businesses it is visionary and involved.		
Birkinshaw & Gibson (2004)			
49	Ambidextrous individuals take the initiative and are alert to opportunities beyond the confines of their own job.		B7
49	Ambidextrous individuals are cooperative and seek out opportunities to combine their efforts with others.		
49	Ambidextrous individuals are brokers, always looking to build internal linkages.		
49	Ambidextrous individuals are multitaskers who are comfortable wearing more than one hat.		
50	First, [the four attributes which describe an ambidextrous employee] constitute acting outside the narrow confines of one's job and taking actions in the broader interest of the organization.		
50	Second, [the four attributes which describe an ambidextrous employee] describe individuals who are sufficiently motivated and informed to act spontaneously, without seeking permission or support from their superiors.		
50	Third, [the four attributes which describe an ambidextrous employee] encourage action that involves adaptation to new opportunities but is		

	clearly aligned with the overall strategy of business.		
51	In combination, these attributes create two dimensions of organizational context: The first, performance management (a combination of stretch and discipline), is concerned with stimulating people to deliver high-quality results and making them accountable for their actions; the second, social support (a combination of support and trust), is concerned with providing people with the security and latitude they need to perform.		B7
54	Diagnose your organizational context.	Discover where the organization currently stands in terms of performance management, social support and the balance between the two.	B7
54	Focus on a few levers, and employ them consistently.	There are many ways to build an organizational context that enables ambidexterity. The higher-performing companies, however, are those that focus consistently on just a few levers.	
54	Build understanding at all levels of the company.	For organizational context to be effective in creating ambidexterity, its message has to be disseminated clearly and consistently throughout the organization. Unless lower-level employees genuinely understand the initiatives of top management, the initiatives will have a minimal impact on individual's capacity for ambidexterity.	
55	View contextual ambidexterity and structural ambidexterity as complements.	Structural separation may at times be essential, but it should also be temporary, a means to give a new initiative the space and resources to get started. The eventual goal should be the reintegration with the mainstream organization as quickly as possible. Contextual ambidexterity can enhance both the separation and reintegration processes.	
55	View contextual ambidexterity as "driving leadership" not as being "leadership-driven".	Ambidexterity arises not just through formal structure or through the vision statement of a charismatic leader. Rather, it is achieved in large part through the creation of a supportive context in which individuals make their own choices about how and where to focus their energies. Leadership [...] becomes a characteristic displayed by everyone in the organization.	