Contextualizing exploitation:
Problemistic search, deliberation, and speciation

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Abstract

Scholars have identified several antecedents of organizational ambidexterity. However, we only have limited understanding of the ways that prior learning characteristics influence the achievement of organizational ambidexterity. In this manuscript, we focus on the degree to which organizations focus on exploitation to uncover the relationship between prior learning characteristics and the achievement of organizational ambidexterity. We argue that organizations' exploitation orientations negatively influence the achievement of organizational ambidexterity because exploitation-oriented organizations grow more exploitation-oriented as exploitation crowds out subsequent exploration. This antagonistic relationship between exploitation and exploration is resolved when organizations are characterized by problemistic search, deliberate learning, or speciation, as shown by a positive association between exploitation orientation and the achievement of organizational ambidexterity.

I. Introduction

Organizational learning (Fiol & Lyles, 1985; Huber, 1991; Levitt & March, 1988) is a central phenomenon that underlies organizations' abilities to survive and prosper. Organizational learning enables organizations to innovate, adapt to environments, and improve efficiency and productivity (Argote, 1999). More fundamentally, organizational learning yields organizational capabilities (Schreyögg

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& Kliesch-Eberl, 2007; Winter, 2000; Zollo & Winter, 2002), or the major sources for the generation and development of sustainable competitive advantages (Barney, 1991; Wernerfelt, 1984). Because there is a widespread agreement that exploitation and exploration (March, 1991) are two alternative and dichotomous modes of organizational learning, research on organizational ambidexterity (Lavie, Stettner, & Tushman, 2010; O'Reilly & Tushman, 2008; Raisch & Birkinshaw, 2008), (i.e., the simultaneous pursuit of exploitation and exploration), has increasingly become the focus of scholarly interests. In particular, there has been a substantial progress in identifying antecedents of organizational ambidexterity (Gibson & Birkinshaw, 2004; Jansen, Simsek, & Cao, 2012; Lubatkin, Simsek, Ling, & Veiga, 2006).

However, research on the influence of prior learning characteristics on the achievement of organizational ambidexterity is surprisingly scarce. We feel this lack of research interest on prior learning characteristics is significant because organizational ambidexterity is closely related to organizational learning. In addition, the relationship between prior learning and organizational ambidexterity is important because organizational learning is characterized as path-dependent (Argote, 1999; Arthur, 1988; David, 1985, 1990; Levitt & March, 1988).

Therefore, we try to propose some propositions with respect to the relationship between prior learning characteristics and organizational ambidexterity in this manuscript. Particularly, we focus on the degree an organization focuses on exploitation, or exploitation-orientation, as an important determinant of the extent to which the organization achieves organizational ambidexterity. We also try to identify contingencies that moderate the ways in which exploitation-orientation positively influences the achievement of organizational ambidexterity.

II. Exploitation Orientation and Organizational Ambidexterity

In this manuscript, we follow March (1991) and others (Benner & Tushman, 2002; Bierly & Chakrabarti, 1996; Crossan, Lane, & White, 1999; Katila & Ahuja, 2002; Puranam, Singh, & Zollo, 2006; Puranam & Srikanth, 2007; Rosenkopf & Nerkar, 2001; Sørensen & Stuart, 2000; Sidhu, Commandeur, & Volberda, 2007; Wu, 2012; Zhou & Wu, 2010) to define exploitation and exploration as alternative modes of organizational learning. More specifically, we define exploitation as the use and refinement of existing knowledge in domains internal to the organization, whereas exploration refers to the search and pursuit of new knowledge in domains external to the organization.

Scholars have defined exploitation and exploration in a wide variety of ways. Namely, the distinction between exploitation and exploration can be operationalized with respect to a firm's strategic emphasis (Adler, Goldoftas, & Levine, 1999; Cao,

Gedajlovic, & Zhang, 2009; He & Wong, 2004; Park, Chen, & Gallagher, 2002; Sirén, Kohtamäki, & Kuckertz, 2012; Tushman & O'Reilly, 1996; Uotila, Maula, Keil, & Zahra, 2009), its degree of innovation radicalness (Greve, 2007; Jansen, Van Den Bosch, & Volberda, 2006; Lee, Lee, & Lee, 2003; Piao, 2010), its distinct functional activities (Hoang & Rothaermel, 2010; Lavie, Kang, & Rosenkopf, 2011; Mc Namara & Baden-Fuller, 2007; Rothaermel & Deeds, 2004), its members' behavioral characteristics (Beckman, 2006; Gibson & Birkinshaw, 2004; McGrath, 2001), and its selection of alliance partners (Beckman, Haunschild, & Phillips, 2004; Lavie & Rosenkopf, 2006). Although these definitions are valid in their respective research contexts, we feel the definition that focuses on an organization's learning characteristics is the most consistent with the way March's (1991) original characterization of the terms, exploitation and exploration. It is also important to note that the learning behaviors of an organization underlie other definitions. Therefore, organizational ambidexterity (i.e., simultaneous pursuit of exploitation and exploration), can be defined as an organization's learning behaviors to benefit from both existing and novel knowledge (Raisch & Birkinshaw, 2008).

One notable aspect of path-dependency (Arthur, 1988; David, 1985, 1990; Levitt & March, 1988) with respect to organizational learning, concerns the trade-off relationship that exists between exploitation and exploration. Exploitation is usually related to improvements, increased efficiency, and incremental adjustments. Exploration is closely linked to variety generation, distinctly new possibilities, distant search, and radical or revolutionary change (March, 1991). Most organizations focus on exploitation at the expense of exploration because the simultaneous pursuit of exploitation and exploration can be difficult (Levinthal & March, 1993). Further, exploitation may crowd out subsequent exploration because an organization's exploitation of existing knowledge is the source of organizational competence (Levitt & March, 1988).

From a behavioral perspective, exploitation crowds out exploration because organizations are trapped at a local peak of their performance landscape as a result of successful exploitation (Levinthal, 1997; Levitt & March, 1988). As an organization exploits existing knowledge, it gradually climbs up the performance hill. Once it reaches at the local peak, an organization stops moving, even when the move is directed toward the global peak. Since a move away from the local peak causes a temporal performance decline, the organization avoids exploring new peaks.

An alternative explanation based on a structural or institutional perspective suggests that this decline may occur because of an increasingly tighter coupling among "choices with respect to activities, policies, and organizational structures, capabilities, and resources" (Siggelkow, 2001, p.838). More specifically, continuous

exploitation of existing knowledge may result in an increasingly tighter coupling among an organization's structure, cognition, resource allocation, rewards, culture, and competences. This can also occur in the demography of the senior management team that favors internally consistent changes over exploratory ones (Adler et al., 2009; Bettis & Prahalad, 1995). Furthermore, stakeholders may also prefer this tight coupling because it is more reliable and accountable. Consequently, the stakeholders may select those organizations that possess tighter coupling over less-tightly coupled competitors, forcing organizations to become structurally inert (Hannan & Freeman, 1984). Sometimes, the stakeholders' influence can force an organization to abandon seemingly attractive and promising new business opportunities because these opportunities appear to be excessively exploratory (Christensen & Bower, 1996).

Therefore, we argue that organizations' exploitation orientation negatively influence the achievement of organizational ambidexterity because exploitation-oriented organizations grow more and more exploitation-oriented as they exploit their existing knowledge. Such a further increase in exploitation disturbs the balance between exploitation and exploration, and decreases the degree of organizational ambidexterity.

On the other hand, exploration-orientation, or the degree to which an organization focuses on exploration, may contribute to the balance between exploitation and exploration. In general, organizations expand opportunities for subsequent exploitation because of their exploration of novel knowledge. By nature, novel knowledge rarely emerges in its perfect form. Therefore, a substantial number of refinements must occur before the new knowledge's potential can be fully realized. For example, a dominant design is usually composed of existing technologies, rather than novel technologies (Abernathy & Utterback, 1978; Clark, 1985; Henderson & Clark, 1990). Organizations substantially refine new technologies before they apply them as part of a dominant design because new technologies are immature. In other words, exploration prepares organizations for subsequent exploitation. However, it is also possible that exploration drives out subsequent exploitation when organizations fall into cycles of exploration, failure, and further exploration (Levinthal & March, 1993). In sum, exploration both increases and decreases subsequent exploitation and contributes to the achievement of organizational ambidexterity. Therefore, our first proposition states:

Proposition 1: *The degree of an organization's exploitation (or, exploration) orientation is negatively (or, positively) associated with its achievement of organizational ambidexterity.*

We argue that the main effect of organizations' exploitation orientation on the

achievement of organizational ambidexterity is negative. However, some other contextual characteristics may exist under which organizations' exploitation orientation can positively influence the achievement of organizational ambidexterity. Below, we present three contingencies that can moderate the ways that exploitation orientation influences the achievement of organizational ambidexterity. They include problemistic search, deliberate learning efforts, and speciation.

III. Problemistic Search

The first condition under which exploitation orientation positively influences the achievement of organizational ambidexterity occurs when organizations become involved in problemistic search (Cyert & March, 1963; Levinthal & March, 1981). Exploitation accompanied by problemistic search enables subsequent exploration and increases the degree of organizational ambidexterity.

Authors who argue that exploitation crowds out exploration assume that most exploitation are successful because, in most cases, anticipated consequences are achieved (Abernathy, 1978; Benner & Tushman, 2003; Holland, 1975; March, 1991; McGrath, 2001). However, this may not necessarily be the case in an environment where competitive requirements change quickly. For example, in a dynamically-changing competitive environment, knowledge exploited to achieve favorable performance quickly grows obsolete (Sørensen & Stuart, 2000; Stuart, 1999). As a result, exploitative organizations may not be able to achieve their performance aspirations. Upon such a performance shortfall, organizations initiate problemistic search.

Organizations initiate problemistic search when they realize that existing solutions to their problems are unsatisfactory. More formally restated, organizations employ problemistic search when their performance fails to reach their aspiration level (Lant, 1992; Lant & Montgomery, 1987; Shinkle, 2012). The formation and achievement of aspiration levels are closely associated with organizations' competitive considerations because organizations form their aspirations in reference to their close competitors' performance (Fiegenbaum, Hart, & Schendel, 1996; Ocasio, 1997), as well as in reference to their own past performance. If achieved performance continues to meet their aspiration level, organizations will not initiate search because they are satisficed with their current solutions. On the other hand, if achieved performance falls short of aspiration levels, current solutions is no longer remain acceptable. Since managers' cognitive capacity is bounded (March & Simon, 1958), it is difficult for organizations to identify true reasons for unsatisfactory performance. A causal ambiguity with respect to cause-and-effect relationships between organizations' actions and performance results (Levitt & March, 1988;

Lippman & Rumelt 1982) might also make precise inferences about ways to fix current solutions difficult to achieve. Therefore, organizations simply abandon current solutions and search for alternative solutions that might allow them to enjoy more favorable performance. In short, upon such unsatisfactory performance, organizations are forced to search for alternative solutions to their problems.

In fact, problemistic search is a key mechanism that underlies organizational adaptations to changing competitive environments. Organizations are built with a bundle of organizational routines that exploit known behaviors, customs, and knowledge, because routines are manifestations of organizational capability (Eisenhardt & Martin, 2000; Nelson & Winter, 1982; Teece, Pisano, & Shuen, 1997). Furthermore, because of organizational routines, employees are better able to cooperate without reliance on extensive negotiations or enforcement measures (March & Simon, 1958; Nelson & Winter, 1982). In other words, exploration of new knowledge is fundamentally at odds with the inherent nature of organizations. Therefore, organizations do not initiate problemistic search unless they recognize undeniable proof that reveals that their current solutions fail to meet competitive requirements. Thus, once organizations recognize this proof, their alternative solutions must not entail incremental modifications to current solutions. Rather, organizations must find drastically different solutions because the performance problems they face are so substantial that major revisions of beliefs, assumptions, and norms must occur (Argyris & Schön, 1978; Hedberg, 1981; Imai, Nonaka, & Takeuchi, 1985; Klein, 1989; Nystrom & Starbuck, 1984).

In general, the theory of problemistic search (Cyert & March, 1963; Levinthal & March, 1981) is primarily applied to the search for alternative solutions that include knowledge, methods, or strategy. However, we feel it is appropriate to extend this theory to the search for alternative learning patterns. That is, in addition to their search for alternative solutions to problems, organizations must also search for alternative learning patterns, or alternative "search rules" (Cyert & March, 1963, p.174) when they realize that current learning performance is unsatisfactory (Baum & Dahlin, 2007; Bingham & Davis, 2012). Therefore, with respect to organizations that have primarily been involved in the exploitation of existing knowledge who then find their performance unsatisfactory, we argue that they must initiate problemistic search for more exploratory learning patterns.

An argument can be made that once organizations recognize their performance shortfall, they search for alternative exploitative learning patterns before they engage in exploratory learning patterns. Considering that managers are generally risk averse (March, 1991), we might expect managers to exhaust alternative exploitative learning patterns before they engage in risky initiatives such as exploratory learning patterns. However, we believe this behavior is unlikely for two reasons.

First, organizations will typically search locally until they realize that their search has been unsatisfactory. At that point, they will expand their scope of search to more distant fields (Cyert & March, 1963). This expansion may not appear perfectly rational because organizations often switch their learning patterns before they have exhausted alternative exploitative learning patterns. This can occur because their rationality is bounded (March & Simon, 1958). In addition, causal ambiguity (Lippman & Rumelt 1982) makes this type of thorough search difficult. Therefore, even if some alternative exploitative learning patterns exist that have been left untried, organizations may adopt exploratory learning patterns once they realize the unsatisfactory results of their exploitative learning.

Second, the degree of risk preference is not necessarily stable because organizations vary their risk preferences based on their performance (March, 1988). More specifically, organizations adjust their risk preferences toward more risk taking based on unsatisfactory performance (Audia & Greve, 2006; Baum & Dahlin, 2007; Bromiley, 1991; Desai, 2008; Kahneman & Tversky, 1979; Lant, Milliken, & Batra, 1992; Miller & Chen, 1994; Wiseman & Bromiley, 1996). As organizations shift their risk preference toward greater risk taking, they are more likely to select exploratory learning patterns rather than exploitative learning patterns.

It is important to note that this increased emphasis on exploratory learning results from the combination of exploitation and problemistic search. As discussed above, exploitation crowds out subsequent exploration (Abernathy, 1978; Benner & Tushman, 2002; Levinthal & March, 1993) unless problemistic search accompanies exploitation. On the other hand, even if organizations realize that their performance has been unsatisfactory, their problemistic search is likely to trigger more exploitative (rather than exploratory) learning in the case of organizations that have primarily engaged in exploratory learning.

Therefore, we argue that exploitation-oriented organizations are more likely to adjust their learning patterns to increase their degree of exploratory learning based on the results of their problemistic search. This increase in exploratory learning patterns may help balance exploitation and exploration and increase the degree of organizational ambidexterity.

Proposition 2: *The degree of an organization's exploitation orientation is positively associated with its achievement of organizational ambidexterity when problemistic search accompanies its exploitation.*

IV. Deliberation

Organizations may increase exploratory learning even before a decline in their

performance occurs. As discussed above, unsatisfactory performance motivates organizations to search for alternative learning patterns because unsatisfactory performance calls organizational members' attention to their lack of appropriate existing knowledge. Similarly, even before a performance shortfall, deliberate efforts to learn can help organizations recognize the limitations of existing knowledge and motivate them to find new knowledge by exploratory learning.

Exploitation crowds out exploration when organizations overestimate the usefulness of existing knowledge, and when they apply existing knowledge in novel contexts where new knowledge would be more appropriate (Miller, 1993). This "negative experience transfer" (Gick & Holyoak, 1987) is a consequence of "premature cognitive commitment" (Langer, 1989) to existing knowledge. It prevents organizations from expanding their scope of learning. Organizations attempt to satisfice by simplifying experiences or by specializing adaptive responses (Levinthal & March, 1993) because managers' cognitive capacity can be so bounded (March & Simon, 1958) that they are unable to process complicated experiences or vary adaptive responses. An organization's focus on exploitation is a typical example of this type of satisficing learning strategy. When they focus on exploitation, organizations may ignore complex aspects of their experiences and narrow their adaptive responses. Therefore, an organization's exploitation orientation is closely associated with the bounded nature of its cognitive capacity.

One way to fully exercise the bounded cognitive capacity is to learn deliberately. Therefore, organizations can alleviate such drawbacks associated with inappropriate focus on exploitation (Heimeriks, Schijven, & Gates, 2012) with deliberate efforts to learn. The risk of misapplication of traditional patterns to new tasks can only be compensated for by the modus of a second-order observation, or observers' reflections on "potential failures and maladjustments" because critical signals of "fundamental change requirements and ways of mastering the new challenges" (Schreyögg & Kliesch-Eberl, 2007, p.926) are often ignored by those charged with direct action. In addition, "the hazards of inappropriate generalization can only be attenuated via explicit cognitive effort," or "retrospective sense-making" (Zollo & Winter, 2002, p.348) to make inferences about the applicability of lessons learned from experience. Therefore, although perceptions of success associated with prior exploitation may hamper effective learning by stimulating dysfunctional reactions such as superstition (Zollo, 2009), the dominance of these dysfunctional reactions may depend on the extent of stimulation of deliberate learning (Muehlfeld, Sahib, & Witteloostuijn, 2012).

Specifically, when organizations make deliberate efforts to learn, they can better and more precisely understand why and how existing knowledge is useful. Organizational learning is not always as semi-automatic as early scholars of

organizational learning (Cyert & March, 1963; Fiol & Lyles, 1985; Huber, 1991; Levitt & March, 1988) presume (Heimeriks et al., 2012; Zollo & Winter, 2002). Organizations may try to force themselves to learn deliberately, by articulating and codifying their experiential learning (Heimeriks et al., 2012; Zollo, 2009; Zollo & Singh, 2004; Zollo & Winter, 2002). For example, some organizations spend time and effort on debriefing sessions and detailed postmortem analyses so that they may deliberately learn from their experiences (Heimeriks et al., 2012; Zollo, 2009; Zollo & Singh, 2004; Zollo & Winter, 2002). By articulating individually-held tacit knowledge, organizations can facilitate ex post sense-making to discover the precise cause-and-effect relationship that might exist between their past actions and associated outcomes (Kale & Singh, 2007; Zollo & Winter, 2002). The codification of task-related knowledge involves critical analysis and abstraction of experiences associated with a specific activity or task (Zollo & Winter, 2002). Thus, organizational members gain "a crisper understanding of what works, or what does not work and why, in the context of managing certain tasks" (Kale & Singh, 2007, p.985) by the process of codification. As a consequence, deliberate efforts to learn can resolve superstitious learning (Zollo, 2009) or help organizations to appropriately apply prior learning across significantly heterogeneous contexts such as acquisitions (Heimeriks et al., 2012; Zollo & Singh, 2004) or alliances (Kale & Singh, 2007).

Even if a precise cause-and-effect relationship is too difficult to identify, organizations' deliberate efforts to learn can help them precisely uncover contextual characteristics associated with effective exploitation of existing knowledge. Mindfulness is another form of deliberate learning efforts (Argote & Todorova, 2007; Langer, 1989; Muehlfeld et al., 2012; Rerup, 2005; Weick & Roberts, 1993; Weick, Sutcliffe, & Obstfeld, 1999). It can be defined as "a state of alertness and lively awareness, which is specifically manifested in . . . active information processing, characterized by cognitive differentiation: the creation of categories and distinctions" (Langer, 1989, p.138). In particular, mindfulness is characterized by the extensive creation of new categories recognized by organizations, or "enriched distinction making" and, even, "beyond distinction making" (Weick & Sutcliffe, 2006). This increase in recognized categories can be enabled by a higher degree of "sensitivity to or awareness of contexts (Langer, 1989, p.159)." In other words, organizations that are more mindful are characterized by more detailed or nuanced distinctions between contexts because they may better resist the simplification of interpretations (Weick et al., 1999). Organizations can make more precise distinctions by paying closer attention to discriminatory details (Weick & Sutcliffe, 2006, 2007; Weick et al., 1999) across seemingly identical contexts. Mindful organizations may better capture unique particulars, such as differences, nuances,

discrepancies, and outliers, that slow the speed by which details are converted into acceptable minor risks, or are simply ignored (Weick & Sutcliffe, 2006). Therefore, mindfulness allows organizations to gain a more precise understanding of the contexts in which existing knowledge can be most effectively exploited. At the same time, contexts in which existing knowledge cannot be exploited are also made apparent. Based on this understanding, organizations may find it easier to switch from exploitation to exploration (Louis & Sutton, 1991) because the possibility of the misapplication of inappropriate existing knowledge can be effectively minimized. Consequently, mindful use of prior experience help balance exploitation and exploration (Rerup, 2005).

In sum, deliberate efforts to learn help organizations understand precise cause-and-effect relationships that underlie exploitation of existing knowledge and its consequences. Deliberate efforts to learn also uncover contexts in which existing knowledge is appropriately (or inappropriately) exploited. Consequently, organizations can avoid inappropriate applications of existing knowledge by recognizing the limitations of existing knowledge. This recognition can also motivate organizations to address the need for new knowledge, because it simultaneously serves as an "enhanced recognition of the need for more fundamental change" (Zollo & Winter, 2002, p.342).

In fact, organizations' needs for new knowledge can also be gradually identified when existing knowledge is exploited to its extreme. Extensive exploitation of existing knowledge can help organizations uncover the limitations of existing knowledge. Then, organizations may become motivated to expand their scope of learning beyond their existing knowledge. For example, organizations may increase the intensity of science search when they exhaust existing knowledge available in their technological domain (Ahuja & Katila, 2004). Therefore, the economy as a whole also grows favorably disposed for basic innovations in the era of technological stalemate (Mensch, 1979). Put differently, the extensive pursuit of exploitation opens "windows of opportunity" (Tyre & Orlikowski, 1993, 1994) for the next round of exploratory learning. However, the exploitation of existing knowledge to its extreme consumes such a substantial amount of time and effort that the competitive environment may quickly change before organizations can switch from exploitation to exploration. Deliberate efforts to learn expedite the switch from exploitation to exploration because these efforts help organizations recognize the limitations of existing knowledge more quickly and precisely.

Therefore, we argue that exploitation-oriented organizations are more likely to involve themselves in exploratory learning if they are characterized by deliberate efforts to learn. This increase in exploratory learning help balance exploitation and exploration and increase the degree of organizational ambidexterity.

Proposition 3: *The degree of an organization's exploitation orientation is positively associated with its achievement of organizational ambidexterity, when the organization is characterized by deliberate efforts to learn.*

V. Speciation

Finally, we argue that exploitation as speciation, or the exploitation of existing knowledge across distinct multiple contexts, increases the degree of organizational ambidexterity by helping organizations to prepare for subsequent exploration.

The concept of speciation was originally developed by biologists (Eldredge & Gould, 1972). The phenomena called allopatric speciation was proposed to explain how species evolve in ways that are consistent with available fossil records. According to Eldredge and Gould (1972), species evolve by the creation of derivative species appropriate for niches peripherally isolated from the original species. In these peripherally-isolated niches, resources available for survival may differ from those available in the original niche. In addition, criteria for the selection of surviving populations may also differ. Consequently, peripherally-isolated populations that possess different characteristics from the original population will be favorably selected. As peripherally-isolated populations accumulate these different characteristics, they also evolve into new species. Eldredge and Gould (1972) argued that this type of evolution occurs "very rapidly" (p.84), in a manner that denies conventional perspective or phyletic gradualism.

This concept of speciation is then applied to the case of technological evolution (Adner & Levinthal, 2000; Levinthal, 1998). Levinthal (1998) argues that technological discontinuities are not singular events. Rather, they are long and slow sequential events that involve speciation and subsequent invasions of new niches, including the original niche (Christensen, 1997; Christensen & Bower, 1996). In this context, speciation describes the application of existing technologies to new domains of application. According to Levinthal (1998), new domains of application are characterized by resource abundance and selection criteria that differ from the original application. Therefore, engineers adjust the original technology so that they can best leverage available resources in new application domains. Adjustments to the original technology are also necessary because unique selection criteria in the new application domains must be taken into consideration. These adjustments eventually transform the original technology and develop a new technological "lineage" (pp.220-221). This new lineage can be a source of technological discontinuities because it differs substantially from the original technology. It also differs from possible refinements of the original technology, because unique resource abundance and selection criteria have differentially influenced the new

lineage's evolution. It is important to note that Levinthal (1998) characterizes the initial shift to new application domains as "quite minor" technological changes, "technologically conservative," or even "no change in technology," emphasizing these shifts' exploitative nature (p.218). However, because speciation is a "separation of reproductive activity" (p.218) that is repeated across time, speciation may "trigger a divergent evolutionary path" (p.218) based on distinct resources abundance and selection criteria.

Other scholars have argued that technological knowledge is not the only type of knowledge that undergoes a process similar to speciation. For example, operational standards or business model "templates" are only imperfectly replicated across multiple sites. This imperfect replication allows experimental adjustments to be made to local requirements. Consequently, learning and the development of new knowledge occurs at the level of the entire organization (Winter & Szulanski, 2001; Winter, Szulanski, Ringov, & Jensen, 2012). The original intention of replication (at headquarters) is to exploit proven knowledge as widely as possible. In fact, precise replication positively influences local outlets' performance (Winter et al., 2012). On the other hand, each local outlet is faced with a distinct set of customers, competitors, and suppliers. As a result, adjustments to operational standards or, even, the business model, are inevitable. This can occur because each outlet independently (and, perhaps, myopically) makes local adaptations; headquarters may find it too difficult to monitor all of these deviations. However, these imperfect replications may not be unproductive for organizations. Local outlets may suffer from unsuccessful experimental adjustments. Yet, the entire organization can learn and generate new knowledge on more successful "templates" by allowing local experimental adjustments. Some local adjustments are failures, but others may result in novel ideas that can be shared with other outlets. Furthermore, failures can also serve as better learning opportunities than successes (Baum & Dahlin, 2007; Madsen & Desai, 2010). For example, small adjustments can serve as meaningful learning opportunities for an entire organization because performance effects can be multiplied by the number of outlets. This can actually serve as a core rationale for the replication of operational standards or business model "templates" across multiple local outlets.

Even organizational routines can also serve as a source of organizational change when they are adjusted to particular contexts by those who enact organizational routines (Feldman, 2000; Feldman & Pentland, 2003; Rerup & Feldman, 2011). Routines are originally described as operational standards (Cyert & March, 1963; March & Simon, 1958) or organizational genes (Nelson & Winter, 1982). These characterizations imply that organizational routines consist of stable and inflexible knowledge that concerns expected behaviors and interactions. Some

scholars have attributed ineffective adaptations to environmental changes to organizational routines (Barron, West, & Hannan, 1994). However, organizational routines are not as rigid as these authors have implied. The effective enactment of organizational routines calls for flexible adjustment to particular requirements and to available resources found in each context. In fact, Feldman and Pentland (2003) emphasize, "there are always contextual details that remain open—and that must remain open—for the routine to be carried out" (p.101). Therefore, these adjustments modify the original organizational routines, or create new organizational routines that represent new knowledge. Scholars have argued that organizational routines are the sources of organizational change and flexibility because local adjustments to organizational routines can influence even "schematic" or "abstract" aspects of organizational routines, or the "ostensive aspect" of routines. This indicates that local changes can cause system-wide changes (Feldman & Pentland, 2003). These changes may result from the existence of a closely interrelated relationship between enacted aspects and the ostensive aspect of organizational routines (Feldman & Pentland, 2003). Actually, the positive relationship between organizational routines and exploratory innovation has already been succinctly indicated by Nelson and Winter (1982). They stated that the accumulation of routines serves as the basis for the emergence of novelty (pp.130−131). Levinthal and Rerup (2006) also argue that routines can prepare organizations for exploration. They stated, "The set of familiar routines is the fodder for rapid innovative action" (p.505).

Interestingly enough, these arguments indicate that two common mechanisms underlie the distinct phenomena that concern technological evolution, the replication of operational templates, and organizational routines. First, exploitative actions are "situated" (Suchman, 1987) or embedded in particular contexts (Orlikowski, 1996). As a result of this embeddedness, adjustments to particular contextual requirements become inevitable, even if organizations intend to exploit existing knowledge as precisely as possible. Second, by recombining seemingly small contextual adjustments, organizations can create new knowledge more effectively and efficiently (Nooteboom, 2000, 2009; Zollo & Winter, 2002). The new knowledge created by the recombination of small adjustments may sometimes result in knowledge that differs substantially from the original knowledge as shown in the argument above. In fact, Nooteboom (2000, 2009) argues that this type of recombination between derivatives of existing knowledge is the source of radically new knowledge. Put differently, an act of exploration is prepared and enabled (sometimes as an unintended consequence) by the exploitation of existing knowledge across multiple distinct contexts.

Therefore, we argue that exploitation-oriented organizations are more likely to

involve themselves in subsequent exploratory learning based on exploitation across multiple distinct contexts. This increase in exploratory learning will help organizations to balance exploitation and exploration enabling organizations to increase their degree of organizational ambidexterity.

Proposition 4: *The degree of an organization's exploitation orientation is positively associated with the achievement of organizational ambidexterity, when exploitation spans across multiple distinct contexts.*

VI. Discussion

In this manuscript, we attempted to shed light on a hitherto underexplored relationship between prior learning characteristics and the achievement of organizational ambidexterity by offering four propositions. Although a close association exists between organizational learning and organizational ambidexterity, the existing research on this relationship is surprisingly scarce. Therefore, our first contribution to these scholarly disciplines is to start addressing this lack of research by proposing that organizations' exploitation orientation negatively influences the achievement of organizational ambidexterity.

We also identified the boundary conditions under which organizations' exploitation orientation positively influences the achievement of organizational ambidexterity. First, problemistic search enables exploitation-oriented organizations to increase their degree of organizational ambidexterity. In addition, exploitation-oriented organizations grow more ambidextrous through exploiting existing knowledge when they are characterized by deliberate learning efforts. Finally, exploitation-oriented organizations are more likely to increase the degree of organizational ambidexterity when they exploit their existing knowledge across multiple distinct contexts. Altogether, organizations' exploitation orientation significantly influences the achievement of organizational ambidexterity both positively and negatively depending on their learning contexts.

With these findings, we also contribute to the scholarly dialogue on antecedents of organizational ambidexterity (Gibson & Birkinshaw, 2004; Jansen et al., 2012; Lubatkin et al., 2006). In addition to antecedents identified by these prior works, we argue that prior learning characteristics significantly influence the extent to which organizations achieve ambidexterity. The proposed emphasis on prior learning characteristics as a potential antecedent of organizational ambidexterity may offer a more generalizable and parsimonious explanation of ambidexterity antecedents than those offered previously because organizational learning underlies a wide variety of organizational phenomena.

Finally, we contribute to the reconciliation of the scholarly dispute on how exploitation influences subsequent exploration. Some scholars argue that as organizations exploit existing knowledge, they subsequently explore less new knowledge (Abernathy, 1978; Benner & Tushman, 2002; Levinthal & March, 1993). Other scholars indicate that the exploitation of existing knowledge positively influences exploratory innovation performance (Katila & Chen, 2008; Sternberg & O'Hara, 2000; Taylor & Greve, 2006; Weisberg, 1999). With our proposition of a contingency perspective, we show how these two arguments might be reconciled. We argue that organizations' exploitation orientation crowds out exploration unless their exploitation is accompanied with problemistic search, deliberate learning, or speciation. It might be possible to build additional theoretically consistent arguments by unraveling the influences of learning contexts as we have done in this manuscript.

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