The effect of learning approaches on the utilization of external knowledge in strategic alliances

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ABSTRACT

Profiting from external knowledge is crucial for a firm's innovation, and strategic alliances are a well-recognized conduit for bringing the benefit of external knowledge as an input to a firm's innovation processes. This study investigates whether the approach a firm follows for learning from an external partner has an impact on the extent to which the learned knowledge is utilized. By contrasting the exploration and the exploitation learning modes in 114 strategic alliances formed by French firms, the authors show that exploration is positively associated with the utilization of knowledge learned from the partner. Furthermore, the findings show that even when the partners' knowledge profiles are alike, exploration is influential.

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1. Introduction

Today, innovation is increasingly characterized as a knowledge-creation process (Nonaka, 1994). However, existing research suggests that firms often lack the resources to fully develop internally the knowledge needed for successful innovation (Noseleit & de Faria, 2013). Not surprisingly, acquiring knowledge from external partners is regarded as a key to success (Conner & Prahalad, 1996; Teece, 1986). Consequently, firms often form strategic alliances to profit from the external knowledge required for innovation success (Doz & Hamel, 1997; Sivadas & Dwyer, 2000).

Regarded as ongoing formal relationships among independent firms, alliances are a useful vehicle for knowledge creation. They involve exchange, sharing, joint development, or provision of technologies, products, and services (Gulati, 1998) and are significant for exploring and exploiting external knowledge (Grant & Baden-Fuller, 2004; Lavie & Rosenkopf, 2006). Because successful innovation requires information sharing and complementary knowledge, the positive link between alliance formation and the utilization of knowledge in innovation efforts has been well established (Baum, Calabrese, & Silverman, 2000).

However, mere exposure to external knowledge does not guarantee the utilization of that knowledge in innovation processes (Dahlander, O'Mahony, & Gann, 2016), because strategically valuable knowledge is

tacit and context-dependent (von Hippel, 1994). Such context dependency can diminish the contribution of any knowledge that has not been developed in the knowledge-creation process of the firm. If knowledge can be easily replicated in or transferred to other contexts, it does not necessarily yield the same level of utility for problem-solving as it does in its original context (Huckman & Pisano, 2006). For this reason, firms have different approaches to how they might benefit from external knowledge via strategic alliances (Fey & Birkinshaw, 2005; Xu, Fenik, & Shaner, 2014). Some firms *explore* a partner's knowledge and focus their attention and efforts on experimenting with new methods, searching for new solutions, entering into new domains of expertise, and challenging internal processes based on the insights and knowledge they acquired from the partner. Such exploration of external knowledge helps the firm develop new solutions by learning from a partner (Zeng & Hennart, 2002). At the other extreme, a firm may *exploit* a partner's knowledge by using that knowledge without challenging its own innovation process. In this approach, the firm applies the partner's knowledge and solution with the least modification and adaptation to the new context (Grant & Baden-Fuller, 2004). Despite the importance of these two approaches in relation to the effect of a partner's knowledge on the innovation outcome, research on strategic alliances has dedicated scant empirical attention to them, especially where the external knowledge differs considerably from the firm's own knowledge base.

As a corollary, the literature notes that a firm utilizes external knowledge when it differs from that of the firm (e.g., Laursen, 2012; Sampson, 2007). Alliance research considers dissimilarity to be the "novelty" that stimulates the utilization of external knowledge in innovation processes

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(e.g., Phelps, 2010). In contrast, similarity leads to a lack of novelty and consequently reduces the utility of external knowledge (Ahuja, Lampert, & Tandon, 2008). Despite this argument, dissimilarity of profiles of the partnering firms naturally represents the idiosyncratic differences across organizational, social, historical, and technical contexts of their respective knowledge bases. These differences make knowledge mobility laborious and challenges the eventual utilization of partner's knowledge in firm's internal processes (Jensen & Szulanski, 2004; Montazemi, Pittaway, Qahri Saremi, & Wei, 2012; Szulanski, 1996, 2000; Szulanski & Jensen, 2006; von Hippel, 1994).

Although prior studies have provided valuable insights into the role of relevance or difference of partners' knowledge bases on the *utilization* of learned knowledge, they are anchored on a basic underlying assumption: They assume that a firm that forms an alliance is motivated to acquire and internalize knowledge from its partner in order to utilize it in internal processes (e.g., Hamel, 1991). However, growing evidence shows that utilization is not always the natural result of knowledge acquisition. For instance, despite the presence of new knowledge and other favorable conditions, some studies have found no evidence of a firm's utilization of a partner's knowledge (Inkpen, 1998a; Inkpen & Tsang, 2007). In some cases, even after successful and clear transfer of knowledge, the receiver firm has no motivation to utilize it due to a lack of adaptation (Davenport & Prusak, 1998; Huckman & Pisano, 2006). Consequently, inattention to a firm's choice of learning approach in a strategic alliance—especially without considering partners' dissimilarities in their knowledge bases—limits our current understanding of how external knowledge is utilized.

Against this background, we investigate how a firm's approach to learning from a partner, the dissimilarity of the partner's knowledge base, and the interaction of these two factors influence utilization of the partner's knowledge. More specifically, this study addresses the following questions: What impact does a firm's *approach to learning* have on its utilization of a partner's knowledge in strategic alliances? Does this impact vary depending on the dissimilarity or similarity of the partner's knowledge base?

Answering these questions will contribute to the literature on learning alliances by underlining the exploration approach as a critical antecedent of external knowledge utilization and by acknowledging the role of partner similarity in this relationship. From a practical standpoint, we argue that a firm utilizes more of the knowledge originated from its alliance partner if it intends to *explore* the partner's knowledge, even if that knowledge is not necessarily new.

To achieve these contributions, the rest of this paper is organized as follows: Section 2 presents the theoretical foundations of the study. Section 3 develops the hypotheses about the role of intent to explore and dissimilarity of partners as well as their interaction on the utilization of external knowledge. Section 4 provides information on the data and methodology used to test our hypotheses. And finally, Sections 5, 6, and 7 present and discuss the results and review the limits and contributions of this work.

2. Theoretical background

To understand the role of the learning approach on the utilization of external knowledge, we adopt organizational search and learning perspectives (Inkpen, 2002; Inkpen & Tsang, 2007; Katila & Ahuja, 2002; Nickerson & Zenger, 2004). The knowledge-based view of the firm considers the firm as a knowledge-creation entity (Nonaka, Toyama, & Nagata, 2000). According to this perspective, a firm defines problems, and to solve those problems, it then generates new knowledge or applies a set of solutions from its existing knowledge base (Gavetti & Levinthal, 2000; Nickerson & Zenger, 2004). A firm's knowledge base consists of accumulated knowledge in diverse domains and helps the firm recognize and evaluate the appropriate problems to solve. Knowledge is therefore considered to be the solution of a particular problem (Nickerson & Zenger, 2004). From this perspective, the firm's two

main tasks are choosing the problem and searching for a solution. Managers have to select a problem that has the potential for the most valuable outcome once it is resolved (Nickerson, Silverman, & Zenger, 2007; Nickerson & Zenger, 2004).

Firms in search of a solution may reach beyond their existing knowledge scope and organizational boundaries (Rosenkopf & Nerkar, 2001). In this case, the firm's capacity to profit from new external knowledge is as critical as its capacity to create internal knowledge (Cohen & Levinthal, 1990). Firms vary greatly in their search strategies. They may look for new knowledge within their existing knowledge boundaries or explore new domains they have not previously investigated (Katila, 2002; Katila & Ahuja, 2002). Each option has its own learning outcomes and drawbacks. Even though searching within existing knowledge increases the depth of experience and learning, it impedes embracing novel solutions from other landscapes by the firm. On the other hand, although searching other landscapes extends the breadth of the firm's knowledge base, integrating novel knowledge domains to the firm necessitates comprehending the path-dependent context from which the novel knowledge has originated.

Inter-firm alliances are among the vital strategies for searching beyond the organizational boundaries (Grant & Baden-Fuller, 1995, 2004; Mowery, Oxley, & Silverman, 1996). As Inkpen (1998a) notes, by bringing together different knowledge bases, the alliance creates unique opportunities for a firm to be exposed to external knowledge. However, realizing the benefits of these opportunities depends on the firm's approach to the utilization of external knowledge (Inkpen & Tsang, 2007).

Earlier alliance research suggests that firms use external knowledge by internalizing their partners' knowledge (Hamel, 1991; Mowery et al., 1996). However, scholars increasingly recognize that utilizing external knowledge via an alliance depends on more than internalization. They note that having access to the knowledge of the partner and combining its service with the knowledge of the firm will also benefit the firm's innovation outcomes (Beamish & Berdrow, 2003; Grant & Baden-Fuller, 2004; Lubatkin, Florin, & Lane, 2001; Zeng & Hennart, 2002). These two approaches are based on March's (1991) dichotomy of organizational learning: exploratory and exploitative learning. Exploratory and exploitative learning differ in their purposes, required mindsets, activities, and organizational practices. While the former is challenging and requires an uncertainty-tolerance mindset, the latter is based on replication of incremental improvement (Levinthal & March, 1981). The ex-post results of exploration are not predictable, but exploitation leads to improvements in existing outcomes.

The first approach reflects a teacher-student relationship, in which the firm seeks a one-time transfer of the partner's knowledge to develop a solution to its problem. Once the knowledge is internalized, the firm either adapts existing processes to utilize the benefit of the new knowledge, or it develops a new solution based on the potential contribution of external knowledge. In other words, the teacher firm provides the knowledge, but the student firm must elaborate on the knowledge to develop the solution to its problem (Lubatkin et al., 2001). On the other hand, if the firm intends to exploit the partner's knowledge, it applies the partner's knowledge and skills but does not necessarily internalize them (Grant & Baden-Fuller, 2004). Exploitation in this context resembles a researcher-researcher relationship, where one firm expects the partner to solve its problem, and in return, the firm will also use its own knowledge or resources to solve a problem the partner has (Zeng & Hennart, 2002).

Despite the insightfulness of these two approaches in alliance research, realizing the benefits of external knowledge via an alliance is bounded by an important limit: the context in which the external knowledge has been originated differs substantially from the context where it is intended to be utilized. This limit resonates with the problem of stickiness of external knowledge to its original surroundings (van de Ven, Polley, Garud, & Venkataraman, 1999; von Hippel, 1994). Research in organizational learning empirically documents stickiness as an issue

in various levels of organizational settings (intra-firm, interfirm, cross-border, etc.). Context dependency makes the utilization of knowledge and its benefits in other settings a difficult and time-consuming practice (von Hippel, 1994). When a firm intends to replicate its internal knowledge, even within its organizational boundaries (i.e., a pure exploitation), the stickiness of knowledge to its surroundings is a hampering issue (Szulanski, 1996). Such stickiness discourages leveraging internal knowledge within organizational boundaries (Jensen & Szulanski, 2004; Li & Hsieh, 2009; Montazemi et al., 2012). This concern also applies to any strategic alliance, which naturally involves at least two different contexts that are brought together via formation of the cooperation. Research shows that alliances are subject to varying levels of partner differences arising from different sectorial, organizational, social, technical, and historical contexts, as well as from dissimilar knowledge bases (Mowery et al., 1996; Oxley & Sampson, 2004; Sampson, 2007; Simonin, 2004). However, little systematic attention has been paid to the interactive effect of such differences and the learning approach that a firm adopts for its alliance. Because in alliances a firm's knowledge is aimed at uses outside of its boundaries, context differences can create ambiguity for the learning partner (Simonin, 1999). Such ambiguity substantially impairs the utilization of external knowledge because the firm cannot fully comprehend the richness of such knowledge (Davenport & Prusak, 1998).

However, context-related differences do not diminish the importance of strategic alliances because the alliances are one of the invaluable channels that bring external novel knowledge to the firm, and they help the firm extend its knowledge base or improve its specialization in given domains (Inkpen & Tsang, 2007). Research on collaborative and open innovation supports the importance of external knowledge as a potent source for improving strategic as well as innovative performance (Chesbrough, 2003; Chesbrough, Vanhaverbeke, & West, 2008; Sampson, 2007). Additionally, excessive similarity is not beneficial due to lack of novelty (Ahuja et al., 2008; Sampson, 2007). The benefits of novel external knowledge come only when the firm prepares and adopts the right learning approaches to utilizing such knowledge.

Otherwise, the costs of handling and assimilating the external knowledge undermine the benefits of the collaborative approach to innovation (Cassiman & Valentini, 2016).

In this study, we investigate these effects by examining the separate and joint effects of the learning approach and the dissimilarity of alliance partners on the extent to which a firm utilizes the knowledge of the partner. Fig. 1 illustrates the framework of the study.

3. Hypotheses development

3.1. "Intent to explore" and external knowledge utilization

Exploration and exploitation require different routines and different types of resources. They also differ in the focus of their attention and imply different mindsets (Gupta, Smith, & Shalley, 2006). We follow the logic of scarcity of time and resources in conceptualizing exploration and exploitation as two ends of a continuum (Gupta et al., 2006; Lavie, Stettner, & Tushman, 2010). Consequently, in a single unit of analysis, both cannot be intended and realized perfectly. In the context of this study, the more a firm intends to perform exploration activities in its alliance, the less intense is its intention to perform exploitation.

A firm shows an exploitative intention to learn when it seeks to use a partner's knowledge to influence and refine its existing processes and complement its own competencies to achieve a superior outcome. The knowledge learned through this approach may have an impact on the efficiency of the innovation process. It also enables firms to "smart-borrow" knowledge that is not central to their activities but, when combined with internal knowledge, may reduce the risk of innovation failure. Because the firm seeks only to harness the knowledge, understanding its underlying causal relationship is not essential for utilization.

In this setting, application outweighs the deep learning of new knowledge. Partners that bring different types of knowledge to an alliance may have access to novel knowledge and insights from their counterparts, but the exploitative nature of the activities seeks the application of knowledge rather than a full understanding of its
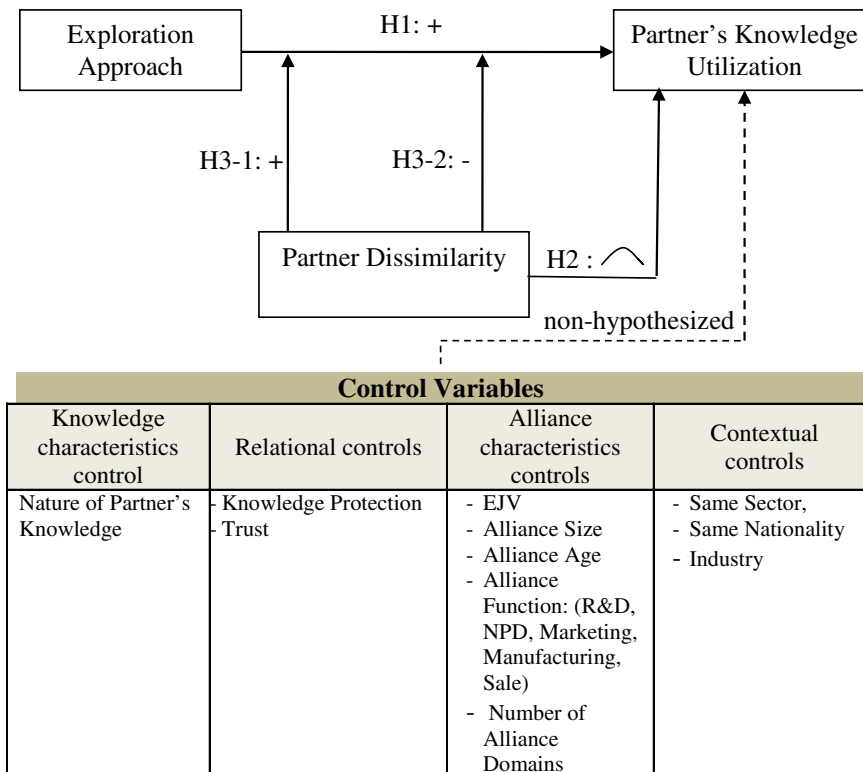

Fig. 1. Research model.

functionality. In such cases, the firm does not need to invest time and effort in internalizing the partner's knowledge for two reasons: first, the knowledge may be accessible on demand from the partner for any future need; and second, the firm's estimation of the future value of the partner's knowledge does not induce internalization. As a result, the knowledge remains in the external source and does not become the property of the firm, but it can be borrowed in case the firm needs its service.

The success of the exploitation learning approach, however, is subject to two necessary antecedents. First, the problem that external knowledge may solve should be defined clearly, and firm managers should be sure that the partner's knowledge will solve the problem. But, in practice, clarifying the problem is not always a straightforward process (Nickerson et al., 2007). For instance, in an innovation project, innovative ideas constantly change over time and diverge and converge into new ideas (van de Ven et al., 1999). This condition implies that the perception of managers does not always determine a given problem because the problem can evolve or change or even be abandoned. Therefore, the manager's estimation of the usefulness of a partner's knowledge can be biased. The second necessary antecedent entails coping with the stickiness of a partner's knowledge. The knowledge of the partner should be replicable; otherwise, this exploitative approach cannot be fruitful, and the firm cannot apply the service of a partner's knowledge (von Hippel, 1994).

In contrast, a firm that forms an alliance with the intent to explore aims to design a learning system. The utility of external knowledge comes by design rather than by default, and the strategic intent to explore is an influential factor in designing an effective learning process (Inkpen & Tsang, 2007). In an exploration alliance, the firm explores the partner's knowledge base, and it commits to searching effectively and dedicates effort and resources to deliberate learning, which leads to new knowledge creation (Lavie et al., 2010; March, 1991). However, exploration is risky; therefore, the firm has to invest in experimentation and exert effort to appropriate external knowledge. The appropriation of external knowledge requires untangling its underlying causal ambiguity (Simonin, 1999) and adaptation in organizing the internal knowledge base. As a result, integration of the new knowledge from the partner into the firm's internal system of known problems and solutions not only extends the firm's knowledge base but also upgrades it (Vasudeva & Anand, 2011).

Integration of new knowledge into the firm's knowledge base challenges the firm's understanding of previous problems and solutions, which in turn can lead to re-evaluation, redesign, and recombination of the internal knowledge base and a better ability to define the problems. In such a setting, as the firm masters its knowledge base, the probability of utilization of the external knowledge for solution creation increases. On the basis of this reasoning, we argue that the probability of utilization of external knowledge in innovation efforts is greater when a firm has an exploratory rather than exploitation approach to profiting from a partner's knowledge and propose following hypothesis.

H1. The more exploratory the firm's intent in an alliance, the more it will utilize the knowledge of a partner.

3.2. Partner dissimilarity

According to organizational search theories, the dissimilarity of partners presents two dimensions of external knowledge. On the one hand, dissimilarity refers to the extent to which the knowledge base of the firm differs from that of its partner (Sampson, 2007). This difference suggests how novel the partner's knowledge is to the firm. On the other hand, dissimilarity can also refer to differences in the companies' styles and norms for processing information and managing knowledge. This dimension then highlights the differences in organizational and management style (Simonin, 1999). Together, both dimensions reflect

the dissimilarities of context in which the partner's knowledge has been developed from the context in which the knowledge is intended to be utilized (van de Ven et al., 1999; von Hippel, 1994).

Research on the role of external knowledge in developing a firm's knowledge base emphasizes in particular the attribute of the "newness" of the external knowledge. This stream of research asserts that by learning new knowledge, firms improve the quality and quantity of their inputs for knowledge-creation processes (Ahuja et al., 2008). New knowledge can be combined with the firm's existing knowledge to provide new solutions and extend the firm's scope of knowledge (Katila & Ahuja, 2002; Mowery et al., 1996). In other words, the novelty of available external knowledge has significant benefits for its utilization in creating innovative outcomes (Phelps, 2010; Srivastava & Gnyawali, 2011).

However, other studies only partially support this argument and show that on a dyadic level, this positive effect is not consistent (Sampson, 2007). They argue that the dissimilarity between partners is linked to a lack of overlap of their knowledge bases, which impedes a company's accurate assessment of the value of the partner's knowledge (Cohen & Levinthal, 1990; Lane & Lubatkin, 1998). High dissimilarity limits a firm's cognitive capacity, which in turn reduces the utilization of external knowledge in the innovation process. In this case, profiting from novelty in different areas is complex and time-consuming (Sampson, 2007; Vasudeva & Anand, 2011).

As previously mentioned, dissimilarity also refers to the contrast in a partner's historical orientation and style of organizing learning activities (Prahalad & Bettis, 1986). Such differences create an incompatibility between the knowledge areas and require costly coordination (Grant, 1996a). In addition, because the original context of the knowledge differs from the context in which the knowledge is being utilized, firms may require a new way of treating the information (Lane & Lubatkin, 1998; Simonin, 1999; van de Ven et al., 1999). This requirement makes utilization of distant knowledge arduous. Therefore:

H2. : Partner dissimilarity has an inverted U-shaped relationship with the firm's utilization of a partner's knowledge.

3.3. Interactive effects of "intent to explore" and partner dissimilarity

H1 and H2 focus on the distinct effects of the exploratory approach and partner dissimilarity with respect to the utilization of a partner's knowledge. In this section, we specify how the interaction of these two characteristics of alliances may have new implications for knowledge utilization. We focus on two extremes of the dissimilarity construct because the literature of alliances and innovation shows that low dissimilarity does not entail novelty and high dissimilarity increases the cost and effort for the utilization of external knowledge. Therefore, these two extremes should *not* be strategically prominent. However, none of the previous studies has considered these extremes regarding the learning approach of the partners. By studying two extremes of dissimilarity, we may uncover why firms form alliances with this characteristic.

As mentioned earlier, the varying level of dissimilarity between the partners reflects the available new external knowledge in the alliance that a firm can feed into search and exploration for innovative outcomes. Therefore, the dissimilarity of available knowledge implies the dissimilarity of input for exploration. Thus, the interaction of the firm's exploration intent and its dissimilarity with the partner is worth examining.

3.3.1. Moderating effect of similarity

Firms follow multiple search strategies for solving their problems and generating knowledge. When they search for a solution within the boundary of their existing knowledge domain, they generate new solutions by combining existing knowledge components. This new knowledge is incorporated into the knowledge base of the firm and

deepens the firm's capacity to solve problems without including new knowledge domains. In other words, through this approach, the firm acquires a deeper understanding of its own knowledge (Katila & Ahuja, 2002; Schilling & Green, 2011).

When a firm with exploration intent forms an alliance with a similar partner, it can profit from the partner's similar knowledge in two ways. First, investigating the partner's experience and skills in managing a similar set of knowledge provides the insight that a firm needs to amend its internal knowledge development process (Katila & Ahuja, 2002). Second, a partner's experience and proficiency in a knowledge domain that overlaps the knowledge base of the firm deepens the firm's understanding of problems and solutions in that domain. This depth of knowledge contributes to the process of identifying strategic problems (Nickerson et al., 2007) and facilitates developing more reliable solutions through a more effective recombination of the firm's existing knowledge (Katila & Ahuja, 2002; Schilling & Green, 2011). Summing up, the partners' similarity facilitates knowledge utilization by the firm that intends to explore the partner's knowledge base and makes the outcome of exploration more reliable:

H3a. : The partners' similarity has a positive moderating impact on the relationship between intent to explore and the partner's knowledge utilization.

3.3.2. Moderating effect of high dissimilarity

A broad scope for exploration increases the number of potential solutions (Fleming, 2001; March, 1991). However, in a broad search scope, the costs of exploring, unpacking, and understanding—which is required for overcoming stickiness of partner's knowledge—and internalizing highly different knowledge elements can exceed the benefits of exploration. The knowledge-based view of the firm considers the integration of knowledge elements to be the essence of the firm (Grant, 1996b); yet, the integration of diverse knowledge resources is costly and ineffective due to the complexity of managing and creating integration (Grant, 1996a). Beside the cost of integrating new knowledge into innovation processes, the organizational search perspective proposes other reasons for diminishing knowledge utilization in cases of extreme search breadth. Recent studies show that the breadth of external sources of knowledge per se does not improve knowledge utilization in innovative outcomes because such breadth directs the firm's attention toward distant problems that are not necessarily central to the needs of the firm (Dahlander et al., 2016).

In an alliance, an increasing emphasis on exploration in the context of partners with highly dissimilar knowledge does not come without cost. Exploring a dissimilar (or distant) partner can eventually lead to inter-firm learning because of the prevalence of new ideas, but utilization of those outcomes involves substantial integration costs that can adversely affect the efficiency of search and exploration of external knowledge (Cassiman & Valentini, 2016). In addition, firms do not focus all their attention on the alliance partner. Instead, they allocate attention according to the objectives and purpose of the alliance. High dissimilarity reduces the focus and, consequently, the acquisition of external knowledge, and therefore, it will also negatively affect how a partner's knowledge is utilized in the innovation processes. Thus:

H3b. : A high level of dissimilarity between partners has a negative moderating effect on the relationship between exploration and utilization of a partner's knowledge.

4. Method

4.1. Sample

The research sample was drawn from the SDC Platinum database on joint ventures and alliances. The SDC data reflect all types of alliances and are collected from public sources, including SEC filings, industry and trade journals, and news reports, and cover alliances from 1988 onwards. While the information collected by this database is not comprehensive (i.e., firms are not asked to report their alliances), the database is nevertheless among the most comprehensive sources of information on alliances and is one of the only sources for large-scale empirical studies on alliance activity (Anand & Khanna, 2000; Sampson, 2007; Schilling, 2009).

Since the norms of knowledge exchange within an alliance vary significantly across countries (Vasudeva, Spencer, & Teegen, 2013), we focused solely on French firms as the source of our data. We started with a list of French firms' alliances, and because this database includes all announced alliances and ultimately unsigned cases remain in the database, we deleted all observations without effective dates from the list. To improve the homogeneity of our final sample, we classified the firms according to their primary Standard Industrial Classification (SIC) code at the 3-digit level. SDC reports the primary SIC code of the partners of an alliance. We then identified a list of alliance managers and executives who were responsible for those alliances. In some cases, if the alliance had been terminated or the alliance manager had left the firm, we tried to identify a manager who had been involved in the alliance. We removed those alliances for which we could not identify an informant. The final sampling frame consisted of 1,251 remaining alliances, and the questionnaire was addressed to the French partners.

4.2. Data collection

The survey relied on a questionnaire developed from prior literature (Appendix A). To avoid the potential problem of common method variance, we followed several steps in designing the data collection (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). First, three scholars of strategic management and alliance reviewed the questionnaire for content and face validity. Then, a pilot study with 20 alliance managers from the sample pre-tested the questionnaire for comprehensibility of questions and conformity to different cases of alliances, such as the type of industry or the domain of activity (R&D, NPD, marketing, manufacturing, and sales). In the pilot study, the behavior of respondents and any confusion were observed. Then, we eliminated sources of ambiguity in the content and design of the final survey. Finally, in the cover letter, we clearly confirmed the protection of anonymity of the respondents.

Data collection took place over six months through a web-based survey. Informants were either the alliance manager or a member of the managerial team involved in the alliance. After two rounds of reminder calls (once a week after sending the questionnaire and then another two weeks after the first contact), 152 questionnaires had been returned. We removed questionnaires with missing answers, and the final sample had complete data from 114 alliances. The sample size corresponds to that of similar previous studies on learning alliances (Nielsen & Nielsen, 2009; Pérez-Nordtvedt, Kedia, Datta, & Rasheed, 2008).

In the sample, 51 alliances were formed with French firms, and 63 alliances were international alliances. Forty-four alliances were formed between firms in the same industry. The sample consists of 40 single-domain alliances (e.g., only R&D or NPD) and 74 multi-domain alliances (e.g., R&D and NPD and manufacturing). Sixteen alliances in the sample were equity-based joint ventures, and the others were contractual strategic alliances.

To detect potential non-response bias, we compared the cleaned sample with a subsample of non-respondent firms (n = 100). We found no significant differences at conventional levels in terms of respondent and non-respondent firm size and the number of domains in the alliance. We also compared the study's main variables between early respondents and late respondents to detect any potential late-respondent bias. No significant differences were found in knowledge utilization, exploration intent, partner dissimilarity, nature of knowledge, trust and knowledge protection.

4.3. Measures

Respondents were asked to indicate how much they agreed with statements on a five-point Likert-type scale. Multiple-item measures of the constructs being studied were developed from items in prior studies related to strategic alliance and knowledge learning and utilization. Wherever possible, we adapted and used existing measures of the constructs. We also added some questions regarding the size and characteristics of both the firm and its alliance partner(s). This procedure is common in similar studies (e.g., Kale, Singh, & Perlmutter, 2000; Nielsen & Nielsen, 2009; Pérez-Nordtvedt et al., 2008). The appendix provides the details of these items and their sources. The questionnaire was designed in French, so to avoid validity issues owing to translation, we asked a management scholar to translate the items of the questionnaire back into English. Minor changes were made to avoid ambiguous wording due to the translation from English to French.

4.3.1. Partner knowledge utilization

Knowledge utilization refers to the application of knowledge learned through an alliance in the innovative processes of a firm. The utilization of a partner's knowledge should be manifested in the development of new products or technology, knowledge of human resources, or efficiency of operations (Chen, 2004). If the firm cannot integrate new external knowledge into its existing knowledge base, learning and acquiring will not contribute to the innovative performance of the firm. We adopted the same approach as Chen (2004) for collecting data related to the utilization of the knowledge learned from the partner ($\alpha = 0.748$).

4.3.2. Intent to explore

The exploration and exploitation concepts represent two learning strategies according to the organizational learning perspective. The concept of exploration in this study was inspired by March (1991). In the alliance context, when the firm intends to explore a partner's knowledge, it applies exploration activities for learning. But if the firm seeks synergy of complementary knowledge, it learns based on an exploitation approach (Grant & Baden-Fuller, 2004). In this study, we use three Likert-type questions relating to the firm's intention to explore the partner's knowledge, generate new knowledge with the partner, and gain access to the partner's knowledge without internalizing it (reversed). These items were developed based on Grant and Baden-Fuller's (2004) reconceptualization of exploration and exploitation in the alliance context. In addition, we follow the proposition of Gupta et al. (2006), who argued that considering exploration and exploitation as two ends of one continuum rather than a dichotomy is more representative in a single-domain context. We included two other questions referring to the need to form further alliances in the same domain of knowledge with the same partner after the current partnership. If the firm intends to explore the partner's knowledge through the current alliance, a future partnership with the same partner in the same domain of knowledge would not be necessary ($\alpha = 0.9012$).

4.3.3. Partner dissimilarity

While the importance of partner dissimilarity can be traced back to various contexts (Boschma, 2005), in alliance research, partner dissimilarity has taken two main dimensions. First, in one extreme, it reflects the dissimilarity of the knowledge bases of partners and partners' organizational contexts. This dimension highlights the novelty of the knowledge and resources that can be contributed by each partner (Phelps, 2010). However, it implies that this novelty comes with a variety of knowledge areas (Katila & Ahuja, 2002) from different contexts, and utilizing them is laborious. This difficulty originates from several sources: cost of coordination for integrating new knowledge into the internal knowledge base (Sampson, 2007), overcoming stickiness, and the cost of coordinating the relationship with a partner that has a different managerial style and mechanisms (Simonin, 1999).

Second, at the other extreme, lack of dissimilarity—presented as similarity or overlap—has been shown to have several effects in alliance and innovation studies. The similarity has been approached as lack of novelty, thus reducing innovation outcomes (Ahuja et al., 2008; Mowery et al., 1996; Sampson, 2007). However, some studies assert a supportive effect of similarity on a partner's knowledge utilization because the similarity of partners' knowledge bases facilitates mutual understanding and knowledge exchange (Lane & Lubatkin, 1998) and makes coordination between partners less challenging due to ease of communication (Simonin, 1999). Put differently, partners with overlapping knowledge bases and organizational styles can overcome the context-dependency issue because their knowledge and information-processing styles are similar (Kostova, 1999; Szulanski, 2000), and they face relatively similar types of strategic problems to solve (Darr & Kurtzberg, 2000). All of this evidence mitigates the lack of novelty in the similarity dimension and shows that these effects enhance innovation outcomes by deepening the firm's knowledge base (Katila & Ahuja, 2002).

In the current study, this construct captures the dissimilarity of the profiles of the partners, which includes dissimilarity of the partners' knowledge profiles and their differences in organizational styles and mechanisms. Items were selected from the literature and pooled around the dissimilarity of knowledge bases and organizational style differences. After reversing the value of the similarity items, the mean of all items was calculated ($\alpha = 0.85$).

4.3.4. Interaction of partner dissimilarity and exploration

To test H3a and H3b, two further variables were developed representing the extremes of partner dissimilarity (Mowery, Oxley, & Silverman, 2002). As in H3a, we investigated low dissimilarity among partners and used LODISS, a dummy variable that equals 1 where the value of partner dissimilarity for the observation is smaller than its first quartile and is 0 otherwise. The variable HIDSS in the same manner reflects a high level of partner difference, which is 1 where the value of partner dissimilarity for the observation is larger than its third quartile and is 0 otherwise.

4.4. Control variables

4.4.1. Nature of a partner's knowledge

Knowledge utilization can be influenced by the extent to which knowledge can be transferred, interpreted, and absorbed (Hamel, Doz, & Prahalad, 1989). Knowledge can be ambiguous, and this ambiguity can reduce learning and its application because it may result in a lack of understanding of the logical linkages between actions and outcomes, inputs and outputs, and causes and effects that are related to technological or process know-how (Simonin, 2004). Ambiguity can be affected by tacitness and complexity (Simonin, 1999). To control for ambiguity in the nature of knowledge, we used eight questions that are pooled on the basis of tacitness and complexity of partner's knowledge ($\alpha = 0.764$).

4.4.2. Inter-partner trust

Trust facilitates inter-firm cooperation and learning (Nielsen, 2005). The level of trust that one company grants to its ally and the level of control it exerts on its ally together define the confidence level (i.e., the expected intensity of cooperative behavior) (Das & Teng, 2000). Trust reflects the belief that a partner's word or promise is reliable and that a partner will fulfill its obligations in the relationship (Inkpen, 1998b). Trust reduces the fear of opportunism by partners, which should then reduce the need for monitoring and other control mechanisms (Norman, 2004). In addition, trust encourages behaviors such as open communication and the willingness to share information. Trust has been shown to increase cooperation and improve flexibility, thus lowering the cost of coordinating activities and increasing the level of knowledge exchange (Nielsen & Nielsen, 2009). Inter-firm trust is a key variable and a form of currency that determines knowledge accessibility

([Inkpen, 2000](#)). We use six items relating to mutual trust and prior relationships with the partner to collect data about trust ($\alpha = 0.744$).

4.4.3. Level of knowledge protection

A protective partner may limit a firm's access to external knowledge ([Simonin, 2004](#)). Firms protect their knowledge with direct rules and contractual limits and through indirect protection policies that reduce the potential attractiveness of the firm's knowledge to the partner. More protection from the source can reduce the value of external knowledge to a firm and naturally reduce its utilization. In this study, three items measured knowledge protection ($\alpha = 0.731$). We also added a count variable that shows the number of domains of activity in the alliance. Previous studies show that a firm may protect its knowledge by limiting the scope of the alliance ([Oxley & Sampson, 2004](#)).

4.4.4. National culture difference

Cultural norms and language differences impede information flow in international alliances ([Kostova, 1999; Lyles & Salk, 1996](#)). These differences can hinder the firm in accurately estimating the value of a partner's knowledge, which in turn influences its potential for utilization by the firm. We control for the effect of the dissimilarity of partners' national culture by a dummy variable, which is 1 if the partners have the same nationality and is 0 otherwise.

4.4.5. Competition

The effect of competition between the partners is controlled for by a dummy variable that is 1 if the partners are from the same sector of activity and is 0 otherwise.

4.4.6. Equity structure

Equity-based joint ventures are more effective in terms of inter-firm learning and innovative outcomes than contract-based cooperation ([Mowery et al., 1996; Oxley & Wada, 2009; Xu et al., 2014](#)). However, some studies show no evidence of the contribution of an equity-based structure on inter-firm learning ([Mowery et al., 2002](#)). To avoid ignoring the potential effect of an equity-based governance structure, we consider a dummy variable that is 1 if the alliance is an equity-based partnership and is 0 otherwise.

4.4.7. Alliance age

In long-term alliances, partners' mutual understanding increases over time. This growth facilitates learning and also enables firms to more accurately evaluate partners' knowledge ([Simonin, 1999](#)). In this research, we counted the number of years between the alliance formation and its termination. If the alliance still exists, we counted number of years up to the present.

Table 1
Descriptive statistics of collected data.

Variable	Obs	Mean	SD	Min	Max
KU	114	2,820175	0,8321185	1,2	4,8
EXPLOR	114	2,940351	1,193768	1,2	4,8
DISS	114	1,434211	0,8284127	0,5833333	3,75
NATUR	114	3,54057	0,6575581	1,25	4,75
TRUST	114	3,149123	0,868256	1,333333	4,666667
PROTECT	114	3,356725	0,8526888	1,333333	5
NUMDOM	114	2,035088	1,003797	1	5
SAMENAT	114	0,4473684	0,4994175	0	1
SAMESEC	114	0,3859649	0,4889717	0	1
EQUITY	114	0,1403509	0,3488843	0	1
DURATION	114	4,482456	2,62133	1	13
SIZE	114	4,363353	1,207694	1,098612	8,411833
RD	114	0,377193	0,4868237	0	1
NPD	114	0,8947368	0,3082471	0	1
MANUF	114	0,3070175	0,4632932	0	1
MARKTG	114	0,1052632	0,3082471	0	1
SALE	114	0,2192982	0,4155979	0	1

4.4.8. Alliance size

The number of personnel working in the alliance serves as a proxy for alliance size. As the standard deviation of data for this item is too high, we use a logarithmic scale and employ its natural logarithm in the statistical models.

4.4.9. Functional domain of alliance

We control for alliance function by five dummy variables that relate to being or not being R&D, new product development, manufacturing, marketing, and sales/distribution alliances.[1] The sum of the value of these variables for each alliance represents the scope of the alliance.

4.4.10. Industry

We controlled for industry effect by adding four dummy variables for industries of the sample: chemical, electronic, telecommunication, software, and other.[2] Because strategic alliances are more common in the telecommunication industry, this industry is taken as the baseline.

5. Results

[Tables 1 and 2](#) display the descriptive summary of data and bivariate correlations between all the variables. Because the coefficient of the similarity of industry and partner dissimilarity is high, the variation inflation factor (VIF) test was conducted under OLS conditions before introducing the interaction variables (i.e., DISS2, EXPLOR*DISS). No multicollinearity effect was detected (mean VIF = 1.9; max VIF = 3.75). Other coefficients are not considered to be high (above 0.7) ([Marquardt, 1970](#)).

As the dependent variable in our sample is limited between 1.2 and 4.8, OLS regression results will be biased ([Kennedy, 2008](#)). If we use OLS regression, we assume the existence of observations whose dependent variable takes the values that are not limited only to the existing range of our dependent variable. This assumption is problematic because OLS then will predict values for dependent variables that could be beyond the actual range of data. When the dependent variable is double-truncated, Tobit regression offers more accurate results because it estimates the best model in the truncated distribution of the dependent variable ([Greene, 2002; Kennedy, 2008](#)).[3] The choice of Tobit regression is consistent with prior research in management of innovation (e.g., [Laursen & Salter, 2006](#)). We checked for the presence of heteroscedasticity, which produces inconsistent estimations, by using Huber–White sandwich estimators. To provide precise support for H2, we examined the marginal impact of partner dissimilarity on knowledge utilization, which was evaluated at different percentile levels of dissimilarity in the sample. The data of independent and dependent variables come from the same sources; therefore, we checked for the existence of potential common method bias. Further, we performed Harman's single-factor test, which is an unrotated exploratory factor analysis ([Podsakoff & Organ, 1986](#)). Seven factors emerged in the results, and no single factor explained the total variance of the variables more than 26.4%. In addition, we conducted a principal component analysis, and the results returned eight components rather than one. Furthermore, since we hypothesized non-linear and moderating relationships in our study, the chance that such relationships would be part of respondents' cognitive map is very low ([Aiken & West, 1991; Chang, van Witteloostuijn, & Eden, 2010](#)). Thus, our results are less likely to be influenced by common method bias.

[Table 3](#) reports the results of multiple hierarchical regression models to test [H1 and H2](#).

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[1] The domain dummy variables are not mutually exclusive, and one alliance can have more than one domain.
[2] Other industries are distributed in different high-tech and low-tech sectors.
[3] We also applied the OLS regression to check the robustness of our results. OLS results are consistent with those obtained in the Tobit estimations and are available from the first author upon request.

Table 2
Correlation Table

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	EXPLOR	1																
2	DISS	-0,408(**)	1															
3	NATUR	-0,427(**)	.572(**)	1														
4	TRUST	0,153	0,115	-0,124	1													
5	PROTECT	-0,361(**)	-0,052	0,321(**)	-0,459(**)	1												
6	NUMDOM	0,108	-0,107	-0,463(**)	0,361(**)	-0,263(**)	1											
7	SAMENAT	0,069	0,100	0,028	0,113	-0,143	0,170	1										
8	SAMESEC	0,337(**)	-0,769(**)	-0,455(**)	0,009	-0,051	0,390(**)	-0,134	1									
9	EQUITY	0,186(*)	-0,391(**)	-0,353(**)	0,179	-0,208(*)	0,464(**)	-0,059	0,406(**)	1								
10	DURATION	0,203(*)	-0,260(**)	-0,316(**)	0,422(**)	-0,065	0,529(**)	-0,105	0,316(**)	0,399(**)	1							
11	SIZE	-0,287(**)	0,008	-0,271(**)	0,178	-0,341(**)	0,480(**)	-0,204(*)	0,045	0,311(**)	0,394(**)	1						
12	RD	0,338(**)	-0,075	0,092	0,372(**)	-0,181	0,184	0,028	0,201(*)	0,207(*)	0,439(**)	0,177	1					
13	NPD	-0,075	0,287(**)	-0,255(**)	0,157	-0,071	0,624(**)	0,194(*)	0,194(*)	-0,026	0,020	0,030	-0,028	1				
14	MANUF	-0,072	-0,055	-0,005	0,023	0,148	0,102	-0,063	-0,315(**)	0,224(*)	0,241(**)	0,421(**)	0,110	-0,144	1			
15	MARKTG	-0,117	-0,013	-0,272(**)	0,019	-0,031	0,448(**)	-0,021	0,175	0,108	-0,020	0,103	-0,149	-0,162	-0,166	1		
16	SALE	-0,034	-0,153	-0,005					0,022	0,030	0,040	0,197(*)	-0,063	-0,025	0,107	0,025	1	
17	KU	0,613(**)	-0,189(*)	-0,438(**)	0,695(**)	-0,575(**)	0,329(**)	0,082	0,270(**)	0,283(**)	0,447(**)	0,025	0,407(**)	-0,002	0,131	-0,001	-0,013	1

Note: Pearson's correlation (Two-tailed tests).
* p < .05.
** p < .01.

Table 3
Tobit regression results(1). Dependent variable: external knowledge utilization.

	−1	−2	−3	−4
EXPLOR	0.274*** (0.042)	0.290*** (0.042)	0.246*** (0.044)	0.441*** (0.104)
DISS		0.194** (0.084)	0.696*** (0.201)	1.120*** (0.287)
DISS2			-0.196*** (0.072)	-0.221*** (0.071)
EXPLOR*DISS				-0.128** (0.062)
NATUR	-0.156* (0.084)	-0.230** (0.089)	-0.245*** (0.086)	-0.324*** (0.093)
TRUST	0.513*** (0.052)	0.487*** (0.052)	0.474*** (0.051)	0.445*** (0.052)
PROTECT	-0.180*** (0.056)	-0.179*** (0.055)	-0.128** (0.056)	-0.121** (0.055)
NUMDOM	-0.050 (0.147)	-0.111 (0.147)	-0.155 (0.143)	-0.132 (0.141)
SAMENAT	-0.011 (0.077)	-0.005 (0.076)	0.019 (0.074)	0.025 (0.073)
SAMESEC	0.084 (0.101)	0.275** (0.129)	0.322** (0.126)	0.308** (0.124)
EQUITY	0.053 (0.127)	0.107 (0.127)	0.095 (0.123)	0.046 (0.123)
DURATION	0.024 (0.018)	0.031* (0.018)	0.035** (0.017)	0.024 (0.018)
SIZE	-0.023 (0.043)	-0.028 (0.042)	-0.015 (0.041)	0.005 (0.041)
RD	-0.050 (0.162)	-0.035 (0.159)	0.014 (0.155)	-0.037 (0.154)
NPD	-0.097 (0.216)	-0.069 (0.212)	-0.067 (0.205)	-0.140 (0.205)
MARKTG	0.161 (0.191)	0.202 (0.188)	0.277 (0.184)	0.343* (0.184)
SALE	-0.042 (0.164)	0.058 (0.167)	0.099 (0.162)	0.109 (0.160)
MANUF	0.111 (0.209)	0.147 (0.206)	0.193 (0.200)	0.206 (0.196)
Industry	Yes	Yes	Yes	Yes
Constant	1.672*** (0.512)	1.654*** (0.503)	1.456*** (0.492)	1.173** (0.503)
LL	−48.25	−45.64	−42.01	−39.96
Pseudo R2	0.66	0.68	0.70	0.72
Chi2	186.48	191.69	198.95	203.05

Standard errors in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%, (n = 114).

Model 1 of Table 3 confirms H1, which predicts a positive relationship between the level of the exploration intent of a firm's and its partner's knowledge utilization. Model 2 of Table 3 shows the effect of partner dissimilarity on partner knowledge utilization. Introducing the squared term of partner dissimilarity in Model 3 confirms the inverted U-shaped effect of partner dissimilarity on knowledge utilization, which is significant at the 1% level and consistent with H2. We computed predicted probability conditional on partner dissimilarity holding all other continuous variables at their mean. Fig. 2 shows the results. Despite the inverted U shape of the impact of dissimilarity, the benefits of partner dissimilarity on external knowledge utilization do not last long. Our marginal effect analysis shows a decreasing return of dissimilarity after the 15th percentile. This effect turns to negative after the 60th percentile, and this finding underlines the importance of a limited level of dissimilarity for knowledge utilization. We discuss this finding in the Discussion's section.

Model 4 of Table 3 shows a negative and significant interactive effect of partner dissimilarity and intent to explore. However, this effect cannot confirm the interaction hypotheses because it cannot show whether this negative effect is the result of the dissimilarity variable affecting exploration or vice versa. Thus, this model does not permit confirmation of H3a and H3b. We need to study dissimilarity in its two extremes to understand its interaction with exploration.
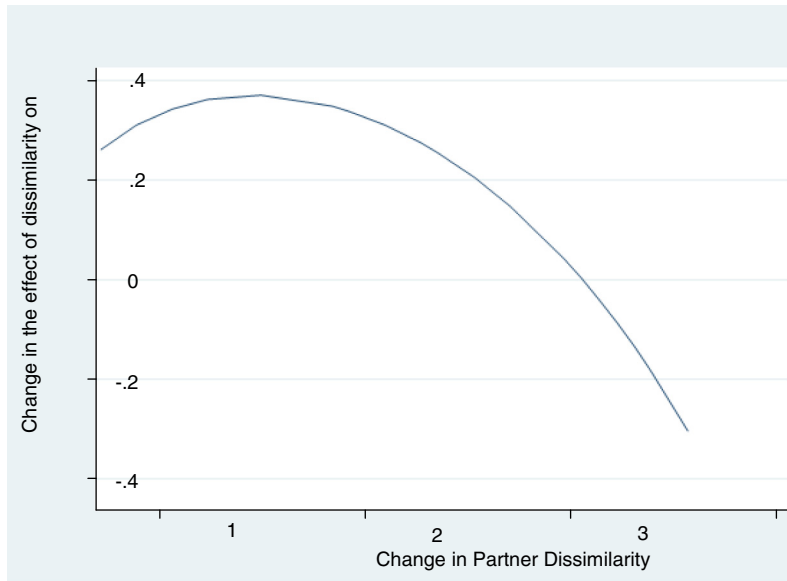
Fig. 2. Average marginal effect of partner dissimilarity.

Table 4 presents the interactive effects of exploration with two dummy variables regarding low dissimilarity (LODISS*EXPLOR) and high dissimilarity (HIDISS*EXPLOR). The results support the positive moderating effect of similarity predicted by H3a and the negative moderating effect of high dissimilarity developed in H3b. Note that the two dummies of high dissimilarity and high similarity have no significant effect on the utilization of external knowledge.

6. Discussion

This study investigates the effect of the learning approach of a firm in an alliance on the utilization of knowledge learned from the partner. Significant theoretical developments in the literature suggest that modes of learning have different impacts on the application and utilization of external knowledge for innovative outcomes (Grant & Baden-Fuller, 1995, 2004; Lubatkin et al., 2001) mainly because the firm in each approach applies different sets of actions to benefit from external knowledge (Chen, Hsiao, & Chu, 2014; Fey & Birkinshaw, 2005). In this study, we have addressed the effect of two general learning modes—exploration and exploitation—on the utilization of external knowledge for innovative outcomes. The results, summarized in Table 5, were both interesting and thought provoking.

First, we found that *exploring* external knowledge has a better impact on its utilization. Exploration motivates the firm to deconstruct and analyze a partner's knowledge to understand its realized (and potential) functions. As a result, the firm will be better able to cope with the context dependency of a partner's knowledge and to integrate the new knowledge into existing innovative processes. A firm with the strategic intention to explore may take the risk to reorganize and renew its own knowledge based on the novel insights that it gains from exploring a partner's knowledge.

We also tested the argument regarding the role of dissimilarity of external knowledge in its utilization. Some studies have shown a positive relationship between dissimilarity in external knowledge and innovative outcomes (Katila & Ahuja, 2002; Phelps, 2010; Xu et al., 2014). However, other studies have affirmed an inverted U shape (Sampson, 2007). We found support for the second argument that asserts an inverted U-shaped effect between the dissimilarity of a partner's knowledge base and the utilization of knowledge learned through the alliance. However, we observed a limited positive contribution from dissimilarity—up to only the 15th percentile of the dissimilarity measure. This specific finding magnifies the difficulties related to the

Table 4

Tobit regression results(2). Dependent variable: external knowledge utilization.

	−1	−2	−3	−4	−5
EXPLOR	0.273***	0.193***	0.274***	0.336***	0.256***
	(0.042)	(0.048)	(0.043)	(0.050)	(0.056)
LODISS	−0.172	−1.538***			−1.503***
	(0.140)	(0.473)			(0.465)
HIDISS			−0.005	0.572**	0.520**
			(0.107)	(0.269)	(0.261)
LODISS*EXPLOR		0.387***			0.359***
		(0.128)			(0.126)
HIDISS*EXPLOR				−0.300**	−0.300**
				(0.129)	(0.126)
NATUR	−0.170**	−0.346***	−0.155*	−0.099	−0.270***
	(0.084)	(0.101)	(0.086)	(0.087)	(0.102)
TRUST	0.501***	0.468***	0.514***	0.488***	0.443***
	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)
PROTECT	−0.163***	−0.143**	−0.179***	−0.157***	−0.111**
	(0.057)	(0.055)	(0.056)	(0.056)	(0.056)
NUMDOM	−0.084	−0.046	−0.050	−0.024	−0.035
	(0.149)	(0.144)	(0.147)	(0.144)	(0.141)
SAMENAT	−0.006	0.002	−0.011	0.008	0.022
	(0.077)	(0.074)	(0.077)	(0.076)	(0.073)
SAMESEC	0.167	0.226*	0.083	0.040	0.201*
	(0.121)	(0.118)	(0.102)	(0.101)	(0.116)
EQUITY	0.085	0.025	0.053	0.049	0.038
	(0.129)	(0.126)	(0.127)	(0.124)	(0.123)
DURATION	0.030	0.010	0.024	0.022	0.012
	(0.019)	(0.019)	(0.018)	(0.018)	(0.019)
SIZE	−0.020	0.002	−0.023	−0.003	0.022
	(0.042)	(0.041)	(0.043)	(0.042)	(0.041)
RD	−0.028	−0.089	−0.050	−0.086	−0.108
	(0.162)	(0.157)	(0.162)	(0.159)	(0.154)
NPD	−0.095	−0.189	−0.097	−0.220	−0.308
	(0.214)	(0.209)	(0.216)	(0.217)	(0.210)
MRKTNG	0.187	0.275	0.161	0.187	0.311*
	(0.191)	(0.187)	(0.192)	(0.187)	(0.183)
SALE	−0.002	0.039	−0.043	−0.036	0.054
	(0.166)	(0.161)	(0.164)	(0.160)	(0.157)
MANUF	0.124	0.126	0.111	0.111	0.134
	(0.208)	(0.201)	(0.209)	(0.204)	(0.196)
Industry	Yes	Yes	Yes	Yes	Yes
Constant	1.716***	2.633***	1.669***	1.288**	2.168***
	(0.511)	(0.581)	(0.516)	(0.529)	(0.595)
LL	−47.51	−43.11	−48.25	−45.60	−40.22
Pseudo R2	0.66	0.70	0.66	0.68	0.72
Chi2	187.96	196.75	186.48	191.77	202.53

Standard errors in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%, (n = 114).

Table 5
Results of the study.

Hypothesis	
H1	Firm's exploratory intent facilitates utilization of the knowledge that the firm learned from its partner.
H2	Dissimilarity between a firm and its partner has in inverted U-shaped relationship on utilization of the partner's knowledge that the firm has learned through the alliance
H3a	In highly similar partners, the relationship between the intent to explore and partners' knowledge utilization is higher
H3b	Too much dissimilarity between partners reduces the positive effect of intent to explore on utilization of partner's knowledge

context dependency of external knowledge, which increases with partners' dissimilarity. Such difficulties reduce the viscosity of the knowledge acquired from the partner (Davenport & Prusak, 1998). In this case, firms are less likely to use new knowledge after its transfer because it does not provide a strong basis for the receiver firm to abandon its old but still working in-house knowledge.

In addition, we conclude that a firm may *not* put all its search efforts into a given alliance. Those studies that found a constant positive link between external knowledge dissimilarity and innovative outcome are designed to consider the firm in its whole external search environment. On the alliance level, the design of the study is focused on only a slice of the external environment. The argument that a firm's learning effort in a single alliance does not necessarily represent its entire search capacity may possibly reflect why alliance-level studies find only a decreasing return from dissimilarity of knowledge utilization. Recent studies show exposure to external knowledge is fruitful only when the firm exerts an effective learning effort to understand external knowledge (Dahlander et al., 2016). To conclude, we believe that such an effective learning system should encompass all the firm's options to explore external knowledge and not merely interfirm alliances.

Our specific results about the interaction effects of two extremes of dissimilarity with intent to explore also provide interesting insights. Conventional wisdom in search literature suggests that a high similarity between partners is not favorable for learning and utilizing a partner's knowledge (Sampson, 2007) and advocates that dissimilarity improves innovative outcomes (Phelps, 2010). However, we find that high similarity mitigates and high dissimilarity weakens the effect of exploratory intent on external knowledge utilization. High similarity reduces the challenge of stickiness and context dependency of external knowledge and facilitates a deep search within boundaries of familiar knowledge domains (Katila & Ahuja, 2002). This finding challenges the literature because it implies that firms can enter an exploration alliance even when the partner has a similar knowledge profile. In other words, dissimilarity is not a requisite for profiting from external knowledge. This result is in line with recent developments in inter-organizational relationship contexts that show the similarity of R&D knowledge between firms to be the determinant of successful coordination and integration (Yu, Umashankar, & Rao, 2015). Our specific finding about high dissimilarity shows that firms' exploratory efforts to surmount the natural context dependency that comes with knowledge that is too novel are subject to inefficiency. This finding implies that profiting from external novel knowledge could be an expensive option if the external knowledge is too distant. This finding is in line with a recent study in an open innovation context that shows the productivity cost of utilizing external knowledge is disproportionally higher than the firm's value from innovative products (Cassiman & Valentini, 2016).

6.1. Theoretical implications and future research perspectives

The choice of learning mode has an impact on how well the firm utilizes external knowledge and how alliances contribute to innovative performance. Understanding and isolating the different modes of learning can untangle the mechanisms by which alliance formation improves innovative outcomes of firms. We find that the intent to explore is more associated with external knowledge utilization, raising the question of why firms make exploitative alliances if the exploratory intent is more fruitful for external knowledge utilization. One potential explanation is that explorative learning is not the only way of profiting from external knowledge. For instance, strategic alliances may improve the innovation processes of the firm, not only by providing new knowledge as the input but also by improving the return to scale of the process (Ahuja et al., 2008). Comparing the alliance formation purposes (e.g., scale-seeking vs. complementarity-driven) of the partnering firms and studying their influence on knowledge utilization, as well as other measures related to innovative outcome, can uncover contingencies where an exploitation alliance is more useful for innovative outcomes than an explorative alliance. Future research should then concentrate on the drivers for a firm to form exploitation alliances for the sake of innovation.

Another potential avenue of research is to disentangle interdependencies between explorative and exploitative alliances of a firm. A firm's alliances build a portfolio by which the firm interacts with external knowledge sources (Vasudeva & Anand, 2011; Vassolo, Anand, & Folta, 2004). A firm may choose to exploit some external knowledge components to become more familiar with them in order to prepare a background for a subsequent exploratory alliance. From a portfolio perspective, future research should understand how a firm configures its exploration-oriented alliances to align with its exploitation alliances to maximize its utilization of external knowledge.[4]

Another important contribution of this study is that the effect of a partner's knowledge dissimilarity on innovative outcomes should be considered only *after* isolating the effect of the learning mode. We found that in exploration alliances, a high level of similarity is beneficial for utilizing the partner's knowledge. This result shows one boundary condition of the variation assumption in innovation studies (Laursen, 2012). If the similarity is important for external knowledge utilization, why does the alliance literature put emphasis on the novelty of external knowledge? Future research should examine where similarity is essential and where dissimilarity is needed. For instance, a recent study shows that in the interfirm context, similarity of knowledge or resource is imperative, and dissimilarity matters only when it comes to the products of firms (Yu et al., 2015). Put differently, partners may share and leverage their similar knowledge, but the way or the context in which they utilize that knowledge could be entirely different.

We also suggest that future studies in organizational search and in the alliance domain should apply an attention-based view of the firm (Ocasio, 1997, 2010; Ocasio & Joseph, 2005). This view explains the context in which the firm distributes attention. On the basis of this approach, any extension in organizational form (such as an alliance) does not necessarily involve the firm's entire capacity for search or learning. In other words, a firm may eventually allocate only partial attention to its alliance. This approach provides potential propositions that may explain the differences found by previous research between the dyadic-level dissimilarity effect and the effect of dissimilarity of *all* external knowledge (not only the knowledge provided by a given partner) on innovative outcomes. The divergent effects of dissimilarity on firm-level performance variables (e.g., innovation, financial performance, etc.) could be associated with either the level of attention that a firm paid to interfirm dissimilarities or the level of distraction that such dissimilarities caused in the firm (van Knippenberg, Dahlander, Haas, & George, 2015). A recent study shows that even when a firm tries to profit from external diverse knowledge, substantial dissimilarity orients the firm's attention toward similar and familiar knowledge rather than on distant knowledge (Piezunka & Dahlander, 2015).

While we believe firmly in our results, we acknowledge some potential limitations of our study. First, we collected information from only

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[4] We are grateful to one of the reviewers for suggesting this point.

one partner of an alliance. Future studies should include multi-sided informants of a given alliance. Second, the survey is a snapshot of the perception of a firm about its alliance. A given alliance evolves during its lifecycle (Doz, 1996), and therefore, managers' perceptions of the alliance can also evolve. Unfortunately, the longitudinal studies using archival data do not accurately account for evolution in the perception of managers. A qualitative study is the most appropriate for uncovering evolving interactions of a firm's decision makers with its alliances. Third, the knowledge utilization construct needs more development. Prior literature adequately focused on the knowledge transfer construct, but as we mentioned earlier, knowledge transfer does not imply knowledge utilization (Davenport & Prusak, 1998). Further development is required to understand how different forms of external knowledge (technical, managerial, marketing, R&D, etc.) are utilized in the firm's processes after the acquisition.

6.2. Practical implications

A potential partner with interesting knowledge does not represent a real opportunity for the firm if the firm cannot deploy a flexible self-challenging approach to adopt the external knowledge. For managers, the first implication of this research is that utilizing external knowledge requires an explorative mindset because such a mindset induces flexibility to challenge existing internal knowledge and processes. This flexibility helps firms to adapt existing knowledge-based practices and adopt new ones. The learning mechanisms that let the firm deconstruct and examine a partner's knowledge guarantee higher potential for using that knowledge in innovation processes.

We also warn practitioners of the difficulties in utilizing the external knowledge that is acquired from partners with distant knowledge profiles. Despite the open innovation literature's strong emphasis on dissimilarity of external knowledge as a valuable source of novelty for ideation, our findings show that even in intra-industry alliances, the more distant the partner's knowledge, the more difficult and costly is its utilization. A partner's valuable knowledge is often interwoven in its original context, which makes it sticky to the partner's organization. Overcoming this stickiness is essential for utilization and replication of external knowledge. This stickiness across partners becomes more significant if the partner's knowledge is too distant from the focal firm's knowledge and experience. Our study shows that the positive contribution of dissimilarity of a partner's knowledge with a firm's internal knowledge does not last long, and firms prefer more similarity and less dissimilarity with their partners. Put differently, understanding the external knowledge, even if it has a limited level of novelty, is more salient to the utilization of that external knowledge than being exposed to a partner with a highly different knowledge profile.

Third, we find that the explorative approach to forming an alliance with highly dissimilar partners can be an inefficient approach for utilization of the external knowledge. This inefficiency occurs because interacting with unfamiliar knowledge and then decoding and integrating it with innovative processes is arduous. Thus, if a firm intends to utilize the services of a distant knowledge of another organization, other interfirm alternatives (e.g., outsourcing, licensing, merger, or acquisition) should be carefully analyzed along with alliance formation.

7. Conclusion

The contribution of external knowledge to the innovation outcome of a firm is unquestionable; however, such a contribution is subject to unique costs and internal elaborations. Nevertheless, the strategies and mechanisms for benefiting from external knowledge need to be identified and investigated. Studies show that firms differ in the ways they learn and internally use external knowledge (Inkpen & Tsang, 2007). We find that firms with an explorative intent are better able to utilize a partner's knowledge. However, due to the context-dependent nature of the external knowledge, its utilization is arduous. The more dissimilar the external knowledge is, the more the uncertainties of how to cope with its stickiness to its original context and how to integrate this distant knowledge in internal processes undermine the potential of its utilization. We conclude that an explorative mindset motivates firms to investigate the novelty of external knowledge, but such exploration should mainly focus on understanding the novelties rather than on being merely exposed to numerous diverse knowledge areas.

Appendix A. Constructs and their items[5]

Dependent variable: Knowledge Utilization (Chen, 2004)
The transferred knowledge from the partner contributes to the following items:

New technology development;

New product development;
Improvement of production efficiency;
Human resources quality.
Independent variable: Explorative Intent (adapted from Grant & Baden-Fuller, 2004)

1. Our objective in this alliance is to explore and learn the knowledge of our partner.
2. We create new knowledge about product and process jointly with our partner.
3. All we need from our partner is having access to its complementary knowledge.*
4. A new alliance with the same partner will not provide interesting knowledge for us.
5. We can rely on our partner to provide its special knowledge in future if it is required.*

Independent variable: Partner Dissimilarity (Cummings & Teng, 2003; Kale et al., 2000; Simonin, 1999)

1. There is high complementarity between our resources/capabilities and those of the partner.
2. We and our partner contribute knowledge in the same domain to the alliance.*
3. We have the necessary knowledge base for understanding the partner's knowledge.*
4. Our partner has the necessary knowledge base for understanding our knowledge.*
5. Exchange with our partner is to some extent difficult due to differences in the knowledge base of two firms.
6. Organizational culture and managerial style of our partner differ from ours.
7. Operational mechanisms of our partner are similar to those mechanisms in our firm.*

Control variables: Nature of Transferred Knowledge (Cummings & Teng, 2003; Norman, 2002; Simonin, 1999)

1. In the majority of cases, we learned our partner's knowledge by reading the printed documents and instructions.*
2. In the majority of cases, we learned our partner's knowledge by working with human resources of our partner.
3. Our new human resources can learn what we have learned from our partner by reading our internal documents and reports.*
4. Knowledge learned from our partner is composed of several interrelated elements.
5. We can easily identify the sources of each element of our partner's knowledge in its organization. *

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5 * stands for reverse-scored items.

6. In case of a lack of clarity, we can quickly find the corresponding person in our partner's organization to ask for the relevant information and instructions.*

7. Combining different pieces of information gathered from our partner's organization gives us a satisfactory understanding of its knowledge.*

8. We need many interactions with the partner to make sense of the interrelationships of different pieces of our partner's knowledge.

Trust (adapted and modified based on Currall & Inkpen, 2002; Gulati, 1995)

1. We have open information exchange with our partner.
2. We are well coordinated with our partner for managing joint activities.
3. We have many informal agreements with our partner for determining common objectives.
4. We have no important conflict with our partner.
5. In the past, we had a prior relationship with the same partner in the same field.
6. In the past, we had relationships with the same partner but in other fields.

Knowledge Protection by the Partner (Norman, 2002; Simonin, 1999)

1. Our partner has strict rules about sharing information in its inter-organizational relationships.
2. The employees of our partner are very protective of any type of information we ask for.
3. The employees of our partner ask for authorization by their hierarchy any time we need new information.

What is/are the domain(s) of activities of the alliance?

- Research;
- Development of new products or services;
- Manufacturing;
- Marketing;
- Sales and after-sale services.

Your partner is from:

- The same sector (Y/N);
- The same nationality (Y/N).

Alliance Type (please select one):

- Equity-based joint venture;
- Non-equity-based relationship.

Age of Alliance:

- The year of alliance formation;
- The year of termination (if it is terminated).

Size of Alliance:

- Log (number of human resources working in/for the alliance).

References

Ahuja, G., Lampert, C. M., & Tandon, V. (2008). Moving beyond schumpeter: Management research on the determinants of technological innovation. *The Academy of Management Annals, 2,* 1.

Aiken, L. S., & West, D. S. G. (1991). *Multiple regression: Testing and interpreting interactions.* Sage Publications, Inc (January 1).

Anand, B. N., & Khanna, T. (2000). Do firms learn to create value? The case of alliances. *Strategic Management Journal, 21*(3), 295–315.

Baum, J. A. C., Calabrese, T., & Silverman, B. S. (2000). Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology. *Strategic Management Journal, 21*(3), 267–294.

Beamish, P., & Berdrow, I. (2003). Learning from IJVs: The unintended outcome. *Long Range Planning, 36*(3), 285–303.

Boschma, R. (2005). Proximity and Innovation: A Critical Assessment. *Regional Studies, 39*(1), 61.

Cassiman, B., & Valentini, G. (2016). Open innovation: Are inbound and outbound knowledge flows really complementary? *Strategic Management Journal, 37*(6), 1034–1046.

Chang, S. -J., van Witteloostuijn, A., & Eden, L. (2010). From the editors: Common method variance in international business research. *Journal of International Business Studies, 41*(2), 178–184.

Chen, C. -J. (2004). The effects of knowledge attribute, alliance characteristics, and absorptive capacity on knowledge transfer performance. *R&D Management, 34*(3), 311–321.

Chen, C. -J., Hsiao, Y. -C., & Chu, M. -A. (2014). Transfer mechanisms and knowledge transfer: The cooperative competency perspective. *Journal of Business Research, 67*(12), 2531–2541.

Chesbrough, H. (2003). *Open innovation: The new imperative for creating and profiting from technology* (First Trade Paper ed.). Harvard Business Press.

Chesbrough, H., Vanhaverbeke, W., & West, J. (2008). *Open innovation: Researching a new paradigm.* USA: Oxford University Press (April 15).

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128–152.

Conner, K. R., & Prahalad, C. K. (1996). A resource-based theory of the firm: Knowledge versus opportunism. *Organization Science, 7*(5), 477–501.

Cummings, J. L., & Teng, B. -S. (2003). Transferring R&D knowledge: the key factors affecting knowledge transfer success. *Journal of Engineering and Technology Management, 20*(1-2), 39–68.

Currall, S. C., & Inkpen, A. C. (2002). A multilevel approach to trust in joint ventures. *Journal of International Business Studies, 33*(3), 479–495.

Dahlander, L., O'Mahony, S., & Gann, D. M. (2016). One foot in, one foot out: How does individuals' external search breadth affect innovation outcomes? *Strategic Management Journal, 37*(2), 280–302.

Darr, E. D., & Kurtzberg, T. R. (2000). An Investigation of Partner Similarity Dimensions on Knowledge Transfer. *Organizational Behavior and Human Decision Processes, 82*(1), 28–44.

Das, T. K., & Teng, B. -S. (2000). A resource-based theory of strategic alliances. *Journal of Management, 26*(1), 31–61.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know* (1st ed.). Harvard Business Press (January 30).

Doz, Y. L. (1996). The evolution of cooperation in strategic alliances: Initial conditions or learning processes? *Strategic Management Journal, 17,* 55–83.

Doz, Y. L., & Hamel, G. (1997). The use of alliances in implementing technology strategies. In M. L. Tushman, & P. Anderson (Eds.), *Managing Strategic Innovation and Change* (pp. 556–580). New York: Oxford University Press https://flora.insead.edu/fichiersti_wp/inseadwp1995/95-22.pdf (Accessed November 29, 2014).

Fey, C. F., & Birkinshaw, J. (2005). External sources of knowledge, governance mode, and R&D performance. *Journal of Management, 31*(4), 597–621.

Fleming, L. (2001). Recombinant uncertainty in technological search. *Management Science, 47*(1), 117–132.

Gavetti, G., & Levinthal, D. (2000). Looking forward and looking backward: Cognitive and experiential search. *Administrative Science Quarterly, 45*(1), 113–137.

Grant, R. M. (1996a). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science, 7*(4), 375–387.

Grant, R. M. (1996b). Toward a knowledge-based theory of the firm. *Strategic Management Journal, 17,* 109–122.

Grant, R. M., & Baden-Fuller, C. (1995). A knowledge-based theory of inter-firm collaboration. *Academy of management proceedings* (pp. 17–21). Academy of Management http://search.ebscohost.com/login.aspx?direct=true&db=vfh&AN=17536229&site=ehost-live

Grant, R. M., & Baden-Fuller, C. (2004). A knowledge accessing theory of strategic alliances. *Journal of Management Studies, 41*(1), 61–84.

Greene, W. H. (2002). *Econometric Analysis* (5th ed.). Prentice Hall (September 1).

Gulati, R. (1995). Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *The Academy of Management Journal, 38*(1), 85–112.

Gulati, R. (1998). Alliances and networks. *Strategic Management Journal, 19*(4), 293–317.

Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal, 49*(4), 693–706.

Hamel, G. (1991). Competition for competence and inter-partner learning within international strategic alliances. *Strategic Management Journal, 12,* 83–103.

Hamel, G., Doz, Y. L., & Prahalad, C. K. (1989). Collaborate with your competitors - and win. *Harvard Business Review, 67*(1).

Huckman, R. S., & Pisano, G. P. (2006). The firm specificity of individual performance: Evidence from cardiac surgery. *Management Science, 52*(4), 473–488.

Inkpen, A. C. (1998a). Learning and knowledge acquisition through international strategic alliances. *The Academy of Management Executive (1993-2005), 12*(4), 69–80.

Inkpen, A. C. (1998b). Learning, knowledge acquisition, and strategic alliances. *European Management Journal, 16*(2), 223–229.

Inkpen, A. C. (2000). Learning through joint ventures: A framework of knowledge acquisition. *Journal of Management Studies, 37*(7), 1019–1044.

Inkpen, A. C. (2002). Learning, knowledge management, and strategic alliances: so many studies, so many unanswered questions. In F. J. Contractor, & P. Lorange (Eds.), *Cooperative strategies and alliances* (pp. 267–289). Oxford, UK: Pergamon.

Inkpen, A. C., & Tsang, E. W. K. (2007). Learning and strategic alliances. *Academy of Management Annals, 1,* 479–511.

Jensen, R., & Szulanski, G. (2004). Stickiness and the adaptation of organizational practices in cross-border knowledge transfers. *Journal of International Business Studies, 35*(6), 508–523.

Kale, P., Singh, H., & Perlmutter, H. (2000). Learning and protection of proprietary assets in strategic alliances: Building relational capital. *Strategic Management Journal, 21*(3), 217–237.

Katila, R. (2002). New product search over time: past ideas in their prime? *The Academy of Management Journal*, 45(5), 995–1010.

Katila, R., & Ahuja, G. (2002). Something old, something new: A longitudinal study of search behavior and new product introduction. *The Academy of Management Journal*, 45(6), 1183–1194.

Kennedy, P. (2008). *A guide to econometrics* (6th ed.). Wiley-Blackwell (February 26).

Kostova, T. (1999). Transnational transfer of strategic organizational practices: a contextual perspective. *Academy of Management Review*, 24(2), 308–324.

Lane, P. J., & Lubatkin, M. (1998). Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19(5), 461–477.

Laursen, K. (2012). Keep searching and you'll find: what do we know about variety creation through firms' search activities for innovation? *Industrial and Corporate Change*, 21(5), 1181–1220.

Laursen, K., & Salter, A. (2006). Open for innovation: the role of openness in explaining innovation performance among U.K. manufacturing firms. *Strategic Management Journal*, 27(2), 131–150.

Lavie, D., & Rosenkopf, L. (2006). Balancing exploration and exploitation in alliance formation. *Academy of Management Journal*, 49(4), 797–818.

Lavie, D., Stettner, U., & Tushman, M. L. (2010). Exploration and exploitation within and across organizations. *The Academy of Management Annals*, 4, 109.

Levinthal, D. A., & March, J. G. (1981). A model of adaptive organizational search. *Journal of Economic Behavior & Organization*, 2(4), 307–333.

Li, C. -Y., & Hsieh, C. -T. (2009). The impact of knowledge stickiness on knowledge transfer implementation, internalization, and satisfaction for multinational corporations. *International Journal of Information Management*, 29(6), 425–435.

Lubatkin, M., Florin, J., & Lane, P. J. (2001). Learning together and apart: A model of reciprocal interfirm learning. *Human Relations*, 54(10), 1353–1382.

Lyles, M. A., & Salk, J. E. (1996). Knowledge acquisition from foreign parents in international joint ventures: An empirical examination in the hungarian context. *Journal of International Business Studies*, 27(5), 877–903.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71–87.

Marquardt, D. W. (1970). Generalized inverses, ridge regression, biased linear estimation, and nonlinear estimation. *Technometrics*, 12(3), 591–612.

Montazemi, A. R., Pittaway, J. J., Qahri Saremi, H., & Wei, Y. (2012). Factors of stickiness in transfers of know-how between MNC units. *The Journal of Strategic Information Systems*, 21(1), 31–57.

Mowery, D. C., Oxley, J. E., & Silverman, B. S. (1996). Strategic alliances and interfirm knowledge transfer. *Strategic Management Journal*, 17, 77–91.

Mowery, D. C., Oxley, J. E., & Silverman, B. S. (2002). The two faces of partner-specific absorptive capacity: learning and cospecialization in strategic alliances. In F. J. Contractor, & P. Lorange (Eds.), *Cooperative strategies and alliances* (pp. 291–320). Oxford, UK: Pergamon.

Nickerson, J. A., & Zenger, T. R. (2004). A knowledge-based theory of the firm: The problem-solving perspective. *Organization Science*, 15(6), 617–632.

Nickerson, J. A., Silverman, B. S., & Zenger, T. R. (2007). The 'problem' of creating and capturing value. *Strategic Organization*, 5(3), 211–225.

Nielsen, B. B. (2005). The role of knowledge embeddedness in the creation of synergies in strategic alliances. *Journal of Business Research*, 58(9), 1194–1204 (Special Section: Inter-organisational research in the Nordic countries).

Nielsen, B. B., & Nielsen, S. (2009). Learning and innovation in international strategic alliances: An empirical test of the role of trust and tacitness. *Journal of Management Studies*, 46(6), 1031–1056.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14–37.

Nonaka, I., Toyama, R., & Nagata, A. (2000). A firm as a knowledge-creating entity: A new perspective on the theory of the firm. *Industrial and Corporate Change*, 9(1), 1–20.

Norman, P. M. (2002). Protecting knowledge in strategic alliances: Resource and relational characteristics. *The Journal of High Technology Management Research*, 13(2), 177–202.

Norman, P. M. (2004). Knowledge acquisition, knowledge loss, and satisfaction in high technology alliances. *Journal of Business Research*, 57(6), 610–619.

Noseleit, F., & de Faria, P. (2013). Complementarities of internal R&D and alliances with different partner types. *Journal of Business Research*, 66(10), 2000–2006 (Strategic Thinking in Marketing Strategic Management in Latin America Corporate Social Responsibility and Irresponsibility Managing Global Innovation and Knowledge).

Ocasio, W. (1997). Towards an attention-based view of the firm. *Strategic Management Journal*, 18(S1), 187–206.

Ocasio, W. (2010). Attention to attention. *Organization Science*, 22(5), 1286–1296.

Ocasio, W., & Joseph, J. (2005). An attention-based theory of strategy formulation: linking micro- and macroperspectives in strategy processes. *Advances in Strategic Management*, 22, 39–61.

Oxley, J. E., & Sampson, R. C. (2004). The scope and governance of international R&D alliances. *Strategic Management Journal*, 25(8-9), 723–749.

Oxley, J. E., & Wada, T. (2009). Alliance structure and the scope of knowledge transfer: Evidence from U.S.-Japan agreements. *Management Science*, 55(4), 635–649.

Pérez-Nordtvedt, L., Kedia, B. L., Datta, D. K., & Rasheed, A. A. (2008). Effectiveness and efficiency of cross-border knowledge transfer: An empirical examination. *Journal of Management Studies*, 45(4), 714–744.

Phelps, C. C. (2010). A longitudinal study of the influence of alliance network structure and composition on firm exploratory innovation. *Academy of Management Journal*, 53(4), 890–913.

Piezunka, H., & Dahlander, L. (2015). Distant search, narrow attention: How crowding alters organizations' filtering of suggestions in crowdsourcing. *Academy of Management Journal*, 58(3), 856–880.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12(4), 531–544.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. -Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, 88(5), 879–903.

Prahalad, C. K., & Bettis, R. A. (1986). The dominant logic: A new linkage between diversity and performance. *Strategic Management Journal*, 7(6), 485–501.

Rosenkopf, L., & Nerkar, A. (2001). Beyond local search: Boundary-spanning, exploration, and impact in the optical disk industry. *Strategic Management Journal*, 22(4), 287–306.

Sampson, R. C. (2007). R&D alliances and firm performance: The impact of technological diversity and alliance organization on innovation. *Academy of Management Journal*, 50(2), 364–386.

Schilling, M. A. (2009). Understanding the alliance data. *Strategic Management Journal*, 30(3), 233–260.

Schilling, M. A., & Green, E. (2011). Recombinant search and breakthrough idea generation: An analysis of high impact papers in the social sciences. *Research Policy*, 40(10), 1321–1331.

Simonin, B. L. (1999). Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic Management Journal*, 20(7), 595–623.

Simonin, B. L. (2004). An empirical investigation of the process of knowledge transfer in international strategic alliances. *Journal of International Business Studies*, 35(5), 407–427.

Sivadas, E., & Dwyer, F. R. (2000). An examination of organizational factors influencing new product success in internal and alliance-based processes. *Journal of Marketing*, 64(1), 31–49.

Srivastava, M. K., & Gnyawali, D. R. (2011). When do relational resources matter? Leveraging portfolio technological resources for breakthrough innovation. *Academy of Management Journal*, 54(4), 797–810.

Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17, 27–43.

Szulanski, G. (2000). The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational Behavior and Human Decision Processes*, 82(1), 9–27.

Szulanski, G., & Jensen, R. J. (2006). Presumptive adaptation and the effectiveness of knowledge transfer. *Strategic Management Journal*, 27(10), 937–957.

Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy*, 15(6), 285–305.

van de Ven, A. H., Polley, D. E., Garud, R., & Venkataraman, S. (1999). *The innovation journey.* New York, NY: Oxford University Press (September 16).

van Knippenberg, D., Dahlander, L., Haas, M. R., & George, G. (2015). Information, attention, and decision making. *Academy of Management Journal*, 58(3), 649–657.

Vassolo, R. S., Anand, J., & Folta, T. B. (2004). Non-additivity in portfolios of exploration activities: a real options-based analysis of equity alliances in biotechnology. *Strategic Management Journal*, 25(11), 1045–1061.

Vasudeva, G., & Anand, J. (2011). Unpacking absorptive capacity: A study of knowledge utilization from alliance portfolios. *Academy of Management Journal*, 54(3), 611–623.

Vasudeva, G., Spencer, J. W., & Teegen, H. J. (2013). Bringing the institutional context back in: A cross-national comparison of alliance partner selection and knowledge acquisition. *Organization Science*, 24(2), 319–338.

von Hippel, E. (1994). "Sticky information" and the locus of problem solving: Implications for innovation. *Management Science*, 40(4), 429–439.

Xu, S., Fenik, A. P., & Shaner, M. B. (2014). Multilateral alliances and innovation output: The importance of equity and technological scope. *Journal of Business Research*, 67(11), 2403–2410.

Yu, Y., Umashankar, N., & Rao, V. R. (2015). Choosing the right target: Relative preferences for resource similarity and complementarity in acquisition choice. *Strategic Management Journal* (n/a–n/a).

Zeng, M., & Hennart, J. -F. (2002). From learning races to cooperative specialization: Toward a new framework for alliance management. In F. J. Contractor, & P. Lorange (Eds.), *Cooperative strategies and alliances* (pp. 189–210). Oxford, UK: Pergamon.