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Organizational Social Capital, Formalization, and Internal Knowledge Sharing in Entrepreneurial Orientation Formation

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This study considers the mediating role of internal knowledge sharing in the relationship between two critical aspects of organizational social capital (trust and goal congruence) and entrepreneurial orientation (EO), as well as how this role might be moderated by the firm's level of formalization. It shows that higher levels of internal knowledge sharing relate to stronger EO, and such knowledge sharing in turn results from higher levels of trust and goal congruence. This study further provides a nuanced picture of the role of formalization in this process. The authors discuss both the study's implications and future research directions.

Introduction

In increasingly turbulent environments, firms must seek out and act on entrepreneurial opportunities to overcome inertial forces and remain competitive (Burgelman, 1991; Covin & Slevin, 1991; Floyd & Lane, 2000). This stance is reflected in the firm's entrepreneurial orientation (EO), which is the extent to which the firm's behavior is characterized by innovation, proactiveness, and risk taking (Covin & Slevin, 1989; Miller, 1983). According to the knowledge-based view, managers throughout the firm can play pivotal roles in shaping EO by sharing their function-specific knowledge with colleagues who reside in other areas of the organization (De Luca & Atuahene-Gima, 2007; Grant, 1996; Szulanski, 1996). In this regard, prior research has established that organizational

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social capital is an instrumental, enabling factor for cross-functional knowledge sharing (Leana & van Buren, 1999; Tsai & Ghoshal, 1998).

Although this research line has generated powerful and enduring theoretical insights, as well as helped catapult social capital to theoretical prominence as a means for understanding firms' entrepreneurial behaviors, limited efforts have centered on defining the boundary conditions of its role (Szulanski, Cappetta, & Jensen, 2004; Tsai, 2001), particularly with respect to the nature of the firm's organizational structure. We focus on one specific aspect of organizational structure, namely the extent to which decision making relies on formal procedures, plans, and policies (Dyer & Song, 1998; Schminke, Ambrose, & Cropanzano, 2000). In their landmark study, Tsai and Ghoshal (1998) investigated the connection between intrafirm social capital and product innovation using a single, decentralized, multinational firm. Therefore, questions about whether and how knowledge benefits resulting from social capital carry over to different structural conditions, defined according to the formality of decision-making processes, remain unanswered. Because strong social relationships facilitate knowledge exchanges by reducing uncertainty about organizational functions (Hansen, 1999; Hansen, Mors, & Lovas, 2005; Monteiro, Arvidsson, & Birkinshaw, 2008; Szulanski et al.; Tsai & Ghoshal), the *relative* importance of these relationships may depend critically on the degree to which features of the surrounding organizational structure, such as its level of formalization, also lend themselves to such uncertainty reduction (Adler & Borys, 1996; Burns & Stalker, 1961; Dyer & Song, 1998). Formalization can also affect the usefulness of internal knowledge sharing for the firm's entrepreneurial endeavors because formal structures inform the ease, or lack thereof, with which knowledge can be applied to entrepreneurial activities (Adler & Borys; Hirst, van Knippenberg, Chen, & Sacramento, 2011; Tsai).

In response, we investigate how organizational social capital interacts with the firm's formalization to promote internal knowledge sharing and a subsequent EO. We argue that the possible benefits of organizational social capital for EO cannot be seen in isolation from (1) the *cross-functional* knowledge sharing that it enables—which encompasses knowledge flows among managers from different functional areas, irrespective of whether these managers operate at the same or at different level in the organization (Payne, Moore, Griffis, & Autry, 2011; Wales, Monsen, & McKelvie, 2011)—and (2) the level of formalization of the firm's structural context in which such knowledge sharing operates. We theorize about the multiple, and somewhat contradictory, roles that formalization might play in this process: It might not only increase the level of internal knowledge sharing directly but also substitute for organizational social capital, such that the role of social capital in stimulating knowledge sharing becomes less important. Formalization also might impede EO, both directly and by attenuating the internal knowledge sharing–EO relationship. We test these arguments with a comprehensive data set collected among Canadian-based firms active in a wide variety of industries. Our empirical findings follow many of our theoretical predictions, yet they also feature a few contrasting results, and thereby paint a comprehensive, nuanced picture of how elements of the firm's social capital *and* organizational structure jointly affect its internal knowledge sharing and EO.

We aim to make three contributions to literature at the nexus between entrepreneurship and social capital. First, even though entrepreneurship research has devoted substantial attention to the role of social capital, empirical studies have focused mostly on the role of *external* social capital in the processes and outcomes of a firm's entrepreneurial endeavors (e.g., Davidsson & Honig, 2003; De Carolis, Litzky, & Eddleston, 2009; Lechner, Dowling, & Welp, 2006; Parker, 2011; Wiklund & Shepherd, 2008). Less attention addresses how social capital embedded within a firm's ranks can be leveraged to

enhance its EO. Following Leana and van Buren (1999), we conceive of organizational social capital as a firm-level construct encompassing the dimensions of trust and goal congruence, and we explicate how these dimensions matter for the firm's internal knowledge flows and subsequent EO. Our investigation of how internal knowledge sharing functions as a mediating mechanism that connects organizational social capital with EO also responds to calls to distinguish between the resources (e.g., knowledge) created by organizational social capital and the role of social capital as a *source* of these resources (Payne et al., 2011).

Second, we help delineate organizational conditions in which social capital exhibits different instrumentality for EO, which contributes to a discussion of how the application of social capital can be "optimized" (Nahapiet & Ghoshal, 1998). Our diverse, multi-firm sample captures variation in a key feature of the firm's organizational structure—namely, the extent to which its decision making relies on formal procedures, plans, and policies (Dyer & Song, 1998; Schminke et al., 2000). We elaborate on the intricate interplay between this structural feature and organizational social capital, as well as how that interplay influences EO. In this sense, our study complements research that focuses on the specific role of structural social capital, such as intrafirm network configurations, on firm-level outcomes (Brass, Galaskiewicz, Greve, & Wenpin, 2004; Hansen et al., 2005; Nahapiet & Ghoshal; Payne et al., 2011; Tsai, 2000). Thus, we show how the level of formalization of a firm's *overall* organizational structure may influence the relative contributions of "softer" aspects of organizational social capital (trust and goal congruence) to a key firm-level outcome such as EO.

Third, whereas prior research has examined the contingent nature of EO (Becherer & Maurer, 1997; Green, Covin, & Slevin, 2008), most of it focuses on the EO–performance relationship and its moderators (e.g., Covin, Green, & Slevin, 2006; De Clercq, Dimov, & Thongpapanl, 2010; Stam & Elfring, 2008), rather than on the formation of EO itself. In response, we provide a theoretical elaboration of how a firm's internal social and structural conditions, both individually and in interaction, affect a firm's EO through internal knowledge sharing. We, thus, extend research that theorizes that the firm's resource base can be an important driver of firm-level entrepreneurship (Covin & Slevin, 1991; Hornsby, Kuratko, Shepherd, & Bott, 2009; Kuratko, Ireland, Covin, & Hornsby, 2005) but that has not differentiated the specific aspects of this resource base.

Theoretical Background

EO

There are two conceptualizations of a firm's EO in extant research: the composite dimension approach, which follows Miller (1983) and Covin and Slevin (1989) to suggest that the dimensions underlying EO work concurrently, such that a firm is entrepreneurial to the extent that it scores high on these dimensions collectively; and the multidimensional approach (Lumpkin & Dess, 1996), which argues that EO dimensions operate independently, and thus treats the dimensions as separate constructs. Recent reflections suggest that neither approach is intrinsically superior, and that research along both directions can be fruitful (Covin & Lumpkin, 2011). We adopt the former approach and conceive of EO as "a sustained firm-level attribute represented by the singular quality that risk taking, innovative, and proactive *behaviors* have in common" (Covin & Lumpkin, p. 863, emphasis added). In this view, EO consists of specific behaviors or actions, rather than reflect a decision-making orientation. Thus, EO entails the simultaneous pursuit of three behaviors: innovation, which involves the introduction of new

products or investments in long-term-oriented research and development (R&D); risk taking, which encompasses the firm's tolerance and rewarding of uncertain projects and its reliance on novel procedures and methods; and proactiveness, to capture bold, wide-ranging strategic actions and a tendency to challenge rather than respond to competitors' actions (Miller).

As we noted, the vast majority of EO research focuses on the relationship between EO and performance, or the contingencies underlying it (for a recent meta-analysis, see Rauch, Wiklund, Lumpkin, & Frese, 2009), although some research has investigated EO antecedents, such as external environmental influences (Becherer & Maurer, 1997; Zahra & Neubaum, 1998), the psychological characteristics of founders or top managers (e.g., Poon, Ainuddin, & Junit, 2006; Simsek, Heavey, & Veiga, 2010), and strategic processes (e.g., Green et al., 2008). We focus on how the knowledge exchanges and social relationships among managers who operate in different functional areas might affect EO formation. With this focus, we treat EO as a pervasive organizational phenomenon that spans the organization and is critically informed by the extent to which resources that reside in different areas of the organization get combined, irrespective of whether these cross-functional knowledge combinations take place at a particular level of the organization or span different levels (Wales et al., 2011). Our focus also resonates with broader arguments that firms' entrepreneurial endeavors derive from the combinations of different knowledge bases, dispersed within the firm (Floyd & Lane, 2000; Floyd & Wooldridge, 1999), and the social mechanisms that underlie such combinations (Nahapiet & Ghoshal, 1998). In view of this focus, we consider the combined roles of internal knowledge sharing and organizational social capital in EO formation.

Internal Knowledge Sharing and Organizational Social Capital

According to the knowledge-based view, the knowledge embedded within a firm's ranks is a key organizational resource for generating entrepreneurial activities because such activities are intrinsically linked with the firm's ability to create *new* knowledge (Carlsson, Acs, Audretsch, & Braunerhjelm, 2009; Kogut & Zander, 1992; Levin & Cross, 2004). Intrafirm knowledge combination, selection, and retention are instrumental building blocks of firm-level entrepreneurship that enable knowledge held by individual managers to be converted into organizational knowledge (Floyd & Wooldridge, 1999). Particularly, Floyd and Wooldridge's model conceives of firm-level entrepreneurship as originating from managers' sharing of and exposure to disparate pieces of knowledge, dispersed across the organization and underpinned by intrafirm knowledge sharing routines. Therefore, the *level* of knowledge sharing between otherwise unconnected areas is important for explaining how organizations can extend their existing activity set (De Luca & Atuahene-Gima, 2007; Grant, 1996; Spender, 1996; Szulanski, 1996).

Despite its possible benefits for the organization, intensive knowledge sharing among managers who operate in different functional areas is often challenging. It may create fears of relinquishing power to peers (Kim & Mauborgne, 1998), particularly if managers regard their function-specific knowledge as an asset that needs protection from appropriation by outsiders (Grant, 1996; Lovelace, Shapiro, & Weingart, 2001; Luo, Slotegraaf, & Pan, 2006). One catalyst for "unlocking" function-specific knowledge is the level of social capital embedded in the firm. Social capital facilitates the exchange of knowledge bases among partners (Nahapiet & Ghoshal, 1998; Yli-Renko, Autio, & Sapienza, 2001), including both tangible and intangible knowledge (Payne et al., 2011). We follow Leana and van Buren (1999) and conceive of social capital as an organization-level phenomenon,

realized through managers' collective trust in one another and the extent to which they share similar goals for their organization.¹

Trust refers to managers' positive expectations about others' motives in situations entailing risk and vulnerability (Zaheer, McEvily, & Perrone, 1998). Some researchers define trust as exchange partners' beliefs and expectations about the reliability and predictability of others' behaviors (Sitkin & Roth, 1993), but this definition does not necessarily reflect "true" trust. The presence of repeated defective behavior, for example, may be predictable but not involve trustworthiness (Zaheer et al.). Therefore, we conceive of trust as managers' willingness to render themselves vulnerable to the actions of others (Rousseau, Sitkin, Burt, & Camerer, 1998). Such trust is not calculative or limited to an occasional transaction that entails a comparison of the benefits and costs of others' malfeasant behavior; instead, it is based on a belief in others' moral integrity (Leana & van Buren, 1999).

Goal congruence refers to the extent to which managers across different functional areas share the same goals (Tsai & Ghoshal, 1998). This dimension of organizational social capital reflects the presence of a shared paradigm that defines how managerial actions fit the firm's overall strategy and goals (Pinto, Pinto, & Prescott, 1993). High levels of goal congruence help coordinate the firm's activities across different functions to accomplish its objectives (Floyd & Wooldridge, 1992; McDonough, 2000). The higher the level of goal congruence, the more willing managers are to subordinate their personal preferences to the collective organizational good, even if it might come at the expense of personal privileges (Leana & van Buren, 1999).

Formalization of Organizational Structure

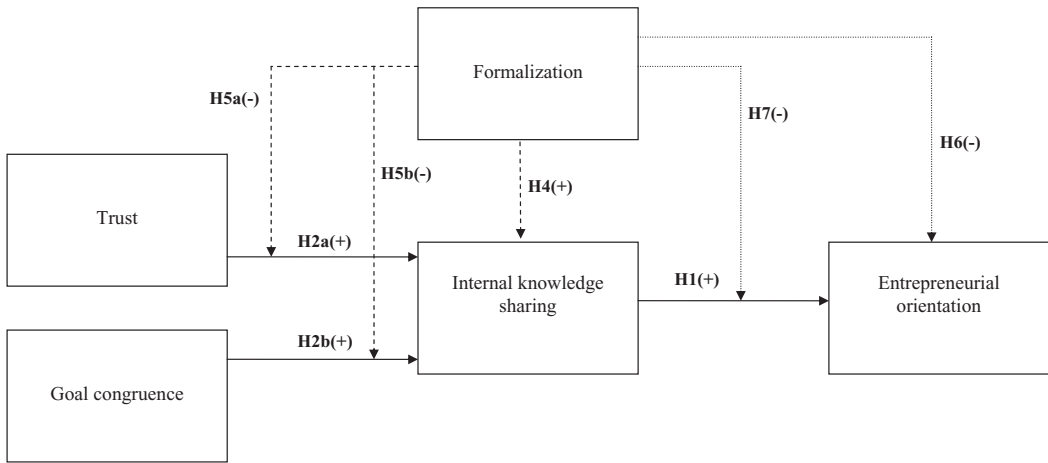
In addition to the nature of internal social relationships, the firm's organizational structure might determine how easily managers share knowledge. In line with previous research (e.g., Patel, 2011; Vlaar, Van den Bosch, & Volberda, 2006), we focus on *formalization* as a key component of organizational structure. It pertains to the extent to which the firm's decision making is based on formally explicated and documented procedures, plans, and policies, rather than on informal processes (Dyer & Song, 1998; Schminke et al., 2000).

Extant research points to both positive and negative aspects of formalization. On the positive side, high formalization implies increased predictability, efficiency, and manageability of organizational decision-making processes (Weber, 1924). Formal systems reduce the uncertainty of intraorganizational functioning by providing guidance and clarity about roles and responsibilities, and in so doing, they decrease managers' role ambiguity and role conflict (Michaels, Cron, Dubinsky, & Joachimsthaler, 1988). Formalization also can increase commitment (Morris & Steers, 1980) and job satisfaction (Snizek & Bullard, 1983). It is akin to the notion of "mechanistic organizational capital," signaling the presence of standardized processes and structures that enhance the efficiency of internal coordination (Kang & Snell, 2009). On the negative side, formalization may limit the scope of the decisions that managers can make because associated administrative

1. Although social relationships take place between individuals, organizational social capital emphasizes that this capital also is jointly owned by the collective, rather than controlled by individuals (Coleman, 1988; Leana & van Buren, 1999; Nahapiet & Ghoshal, 1998). Our consideration of social capital at the organizational level represents vertical theoretical borrowing (Whetten, Felin, & King, 2009), which is particularly appropriate when the focal phenomenon reflects a common experience that binds organizational members and has a unique impact on the organization's interests and performance.

Figure 1

Conceptual Framework



Note: Hypothesis 3 (not shown) states that internal knowledge sharing mediates the relationship between organizational social capital (trust/goal congruence) and entrepreneurial orientation.

control mechanisms regulate and direct their behavior (Burns & Stalker, 1966). Adherence to formal rules also may inhibit creativity (Dougherty & Heller, 1994; Hirst et al., 2011), particularly if such rules become “ritualistic” and hinder managers from critically evaluating their firm’s past decisions (Miller, 1987). All in all, formalization can engender bureaucratic decision making and acting, which may hamper the emergence of novel ideas (Dougherty & Corse, 1995; Mintzberg, 1979).

In what follows, we formulate several hypotheses with respect to the roles of these aforementioned organizational characteristics—internal knowledge sharing, organizational social capital, and formalization—in EO formation. The hypotheses are summarized in Figure 1.

Hypotheses

Internal Knowledge Sharing and EO

Exchange partners typically can derive great benefits from developing intensive knowledge sharing routines with one another (Dyer & Singh, 1998). Firms marked by stronger internal knowledge sharing routines perform better on creative tasks because they can draw from a richer set of cognitive resources (Bantel & Jackson, 1989). The combination of disparate pieces of knowledge increases abilities to solve complex and nonroutine problems (Grant, 1996; Wanous & Youtz, 1986). Similarly, we hypothesize that high levels of internal knowledge sharing should increase the firm’s EO.

First, Floyd and Wooldridge (1999) suggest a direct connection between the level of intrafirm knowledge sharing and firm-level entrepreneurship. To establish an entrepreneurial posture, the knowledge held by individual managers needs to be converted into *organizational* knowledge through the critical mechanism of intensive intra-firm exchanges that span the organization. Individual knowledge does not automatically

translate into entrepreneurial action; it requires extant knowledge sharing routines that connect the firm's different knowledge domains (Floyd & Wooldridge). These arguments strongly resonate with the knowledge-based view, which suggests that strong knowledge sharing routines lead to increased knowledge depth (Cohen & Levinthal, 1990), which in turn enhances abilities to identify the value of knowledge for new applications (Katila & Ahuja, 2002; Zollo & Winter, 2002).

Second, entrepreneurial opportunities often are multifaceted, including aspects of technology and marketing (Grégoire, Barr, & Shepherd, 2010), which make them less obvious and difficult to realize single-handedly. For example, Tripsas and Gavetti (2000) investigate Polaroid's response to the rise of digital photography, and show how its inability to bring various pieces of relevant knowledge together led it to overlook critical opportunities. Intensive knowledge sharing that spans different functional areas brings together complementary knowledge, and thus enriches the firm's collective knowledge base (De Luca & Atuahene-Gima, 2007; Love & Roper, 2009), enhancing its ability to create the *new* knowledge needed to recognize and exploit entrepreneurial opportunities (Cohen & Levinthal, 1990; Floyd & Lane, 2000; Hornsby et al., 2009). Thus, when firms promote more intensive knowledge sharing within their ranks, they are better equipped to act on entrepreneurial opportunities.

Third, the development of a more diverse repertoire of knowledge, resulting from intensive knowledge sharing, enables firms to perceive more varied pathways to entrepreneurial activity, which should increase the perceived feasibility of such activity (Dess et al., 2003; Floyd & Lane, 2000). Firms can more rapidly and confidently act on entrepreneurial opportunities when they compare and contrast different decision alternatives in parallel (Eisenhardt, 1989). For example, in their examination of mutual funds, Rao and Drazin (2002) find that the combination of diverse skills within a firm substantially increases the range of new product categories considered and implemented. The multitude of alternatives afforded by the cross-fertilization of knowledge across functional areas makes firms more efficient in comparing the relative strengths and weaknesses of different pathways to entrepreneurship, increasing confidence that current knowledge can be effectively applied to the selected alternative (Dimov, 2010). When knowledge sharing is less intensive, firms likely perceive fewer alternatives to their current activity set and should be less engaged with entrepreneurial opportunities (Staw, 1981), thus decreasing their EO.

Hypothesis 1: There is a positive relationship between the firm's internal knowledge sharing and EO.

Organizational Social Capital and Internal Knowledge Sharing

As outlined, our conceptualization of organizational social capital reflects collective trust and goal congruence among the firm's managers (Leana & van Buren, 1999). Trust indicates managers' beliefs that colleagues in other functional areas will not engage in opportunistic behavior, even if the opportunity to do so arises (Zaheer et al., 1998). Although extremely high trust levels can imply a danger of complacency and mitigate relationship efforts (Uzzi, 1997), we follow prior research (e.g., Tsai & Ghoshal, 1998; Yli-Renko et al., 2001) to hypothesize a positive relationship between the firm's levels of trust and internal knowledge sharing. Intrafirm exchanges that cross functional areas are typically marked by a certain level of competition because different areas compete for the firm's resources in the pursuit of their own goals, agenda, and strategic priorities (Luo et al., 2006; Tsai, 2001). When managers feel assured that their

colleagues will not take advantage of them—such as by appropriating others' knowledge to advance their own interests—their willingness to exchange knowledge increases (Coleman, 1988; Levin & Cross, 2004). Further, in conditions of high trust, the total amount of knowledge shared will increase to include the sharing of highly sensitive or confidential knowledge (Yli-Renko et al.), such as knowledge derived from previous personal failures (De Luca & Atuahene-Gima, 2007), because there is a diminished risk that colleagues will opportunistically exploit this knowledge (McEvily, Perrone, & Zaheer, 2003; Zaheer et al.).

Hypothesis 2a: There is a positive relationship between trust and internal knowledge sharing.

Goal congruence refers to the degree to which managers' goals converge to reflect a similar vision of the firm's current and future undertakings (Nahapiet & Ghoshal, 1998). We hypothesize a positive relationship between goal congruence and internal knowledge sharing (Tsai & Ghoshal, 1998). When managers share the same ideas about the current and future directions of their organization, they are more motivated to engage in intensive knowledge sharing, in the anticipation that it will benefit the well-being of the firm and the attainment of its goals (Leana & van Buren, 1999). When goals align, managers are more loyal to the collective organization to which they belong and are more willing to invest their time and effort in sharing expertise and insights with others (Nahapiet & Ghoshal)—although some research also suggests that in extreme cases, such alignment may lead to consensus seeking and lesser motivation to seek out others' knowledge (Homburg, Krohmer, & Workman, 1999). Goal congruence also induces a common, dominant logic among managers, including shared preferences for how to process knowledge and solve problems (Lane & Lubatkin, 1998). Such logic creates a deeper understanding of how knowledge held by others can help solve particular problems; it further increases motivation to engage in intensive knowledge sharing efforts (Cohen & Levinthal, 1990). That is, the presence of common goals improves managers' *ability* to foresee the organizational benefits of intensive sharing of knowledge dispersed across the organization.

Hypothesis 2b: There is a positive relationship between goal congruence and internal knowledge sharing.

Combining the preceding arguments, we hypothesize a mediating effect of internal knowledge sharing, such that trust and goal congruence affect EO *through* internal knowledge sharing. Thus, internal knowledge sharing should function as a critical intermediate mechanism that connects organizational social capital with the firm's EO.

Hypothesis 3: Internal knowledge sharing mediates the relationships of trust and goal congruence on the one hand with EO on the other hand.

Formalization

In addition to the firm's internal social capital, we consider the role of its organizational structure, particularly the level of formalization in its decision making (Dyer & Song, 1998; Schminke et al., 2000). We hypothesize a positive relationship between formalization and internal knowledge sharing, yet we also expect that organizational

social capital and formalization may act as substitutes, such that trust-based relationships and congruent goals become less instrumental for enhancing internal knowledge sharing in conditions of high formalization.

First, high formalization levels should increase the extent to which managers share their function-specific knowledge with colleagues in other areas. Formalized systems offer guidelines for how and when to interact with peers (Adler & Borys, 1996), and thus create a structured mechanism for enhanced collaboration (Tushman & Anderson, 1997). Formalization reduces managers' role ambiguity; it becomes clearer how their knowledge compares with that held by colleagues in other functional areas (Michaels et al., 1988), and the motivation to engage in intensive knowledge sharing thus increases (Adler & Borys). In highly formalized settings, well-established procedures, plans, and policies can provide managers with a wider range of contextual information that helps them see the benefits, for themselves and for their firm, of exchanging their knowledge base with those of colleagues in other areas (Adler & Borys). In a similar vein, innovation literature shows that formalization enhances the frequency and bidirectionality of communication across functions (Moenaert & Souder, 1990; Ruekert & Walker, 1987; Song, Neeley, & Zhao, 1996).

Hypothesis 4: There is positive relationship between formalization and internal knowledge sharing.

Second, formalization moderates the relationship between organizational social capital (trust and goal congruence) and internal knowledge sharing, such that this relationship is *attenuated* at higher levels of formalization. Formalization decreases the uncertainty and variability of managerial behavior (Mintzberg, 1979), which should reduce the possibility that managers give priority to their function-specific interests at the expense of the interests of colleagues in other areas (Adler & Borys, 1996), and in turn diminish the incremental benefits of organizational social capital for internal knowledge sharing. We expect that this attenuation effect operates for both trust and goal congruence. High levels of formalization relate negatively to perceptions of unfairness (Schminke et al., 2000; Schminke, Cropanzano, & Rupp, 2002) and opportunism (Dahlstrom & Nygaard, 1999), and thus can function as substitutes for trust-based relationships. In addition, formalization may substitute for goal congruence—or in our context, decrease the incremental importance of goal congruence for enhanced internal knowledge sharing—because formalized procedures *reduce* the resistance to collaborate even when managers hold divergent interpretations of similar activities (Auh & Menguc, 2007). In contrast, low levels of formalization add uncertainty to managerial interactions, such that colleagues' behavior becomes less predictable, and the need for strong organizational social capital to guarantee steady knowledge flows increases (Adler & Borys; Sine, Mitsuhashi, & Kirsch, 2006). Limited formalization, thus, makes managerial behavior and decisions more opaque and contested, increasing the importance of organizational social capital for fuelling intensive internal knowledge sharing (Michaels et al., 1988; Vlaar et al., 2006).

Hypothesis 5: The positive relationships of (a) trust and (b) goal congruence with internal knowledge sharing are negatively moderated by the level of formalization, such that the relationships are stronger at lower levels of formalization.

We also consider the implications of the firm's formalization levels for its EO. Formalization should influence the firm's EO directly as well as indirectly by reducing the

instrumentality of internal knowledge sharing for enhancing EO. The reliance on formal procedures, plans, and policies in the firm's decision making should establish a hierarchical system, in which top management has greater authority to steer the behavior of individual managers toward the status quo, which limits the latter's creativity and innovation (Burns & Stalker, 1961; Dougherty & Corse, 1995; Hirst et al., 2011; Thompson, 1965). With high levels of formalization, top management has a greater ability to specify what managers must do to comply with the current organizational situation, as opposed to letting managers decide for themselves whether and how new courses of action can be pursued (Baum & Wally, 2003). Similarly, formalized settings limit the decision choices that individual managers can make because of the associated formal control mechanisms that regulate managerial decision making (Mintzberg, 1979). Fredrickson (1986) notes that formalization reduces managerial assertiveness and enhances "the likelihood that strategic processes will be motivated by reactive (e.g., problem solving) as opposed to proactive (e.g., searching for opportunities) behavior" (p. 287). In all, these arguments suggest the following hypothesis:

Hypothesis 6: There is a negative relationship between formalization and EO.

Further, we argue that formalization *attenuates* the instrumentality of internal knowledge sharing for enhancing the firm's EO. Formalization imposes an environment of control on managers, reducing the flexibility with which they can creatively exploit their collective knowledge bases (Chen & Huang, 2007; Hirst et al., 2011; Van den Bosch, Volberda, & de Boer, 1999). By restricting managers' flexibility, formalization should hamper the extent to which they use their and others' knowledge, particularly knowledge that can lead to endeavors that vary from the firm's current action domain (Hurley & Hult, 1998; Low & Mohr, 2001). Similarly, formal procedures and rules tend to restrict the depth of analysis of previous experiences (Andrews & Smith, 1996), thereby limiting the ability to leverage cross-functional knowledge sharing into creative behaviors (Love & Roper, 2009). Finally, high formalization can "ritualize" knowledge sharing routines, such that they reinforce the firm's current knowledge bases, rather than update or improve knowledge in light of new external circumstances (Miller, 1987).

In contrast, in conditions of low formalization, managers experience fewer restrictions in their decision making, thereby enjoying greater freedom to consider how their own knowledge base can be combined with those of others to exploit entrepreneurial opportunities. Developing new products, undertaking risky projects, or proactively competing with external market players—the behaviors that underlie the firm's EO—typically require high levels of organizational adaptability with respect to the exploitation of the firm's current knowledge set (Floyd & Wooldridge, 1999; Miller, 1983). A structural context marked by a lower reliance on formal procedures, plans, and policies provides an ideal platform for managers to be creative in channeling their own knowledge, in combination with that of others, into entrepreneurial endeavors (Kuratko et al., 2005). Low formalization implies that managers have more degrees of freedom to evaluate and combine others' knowledge with their own, so the effectiveness of internal knowledge sharing for enhancing the firm's EO should be higher in such circumstances.

Hypothesis 7: The positive relationship between internal knowledge sharing and EO is moderated by the level of formalization, such that the relationship is stronger at lower levels of formalization.

Research Method

Data Collection

To test our hypotheses, we extracted all firms included in Hoover's Business Directory that are headquartered in Canada, then retrieved a random sample of 1,500 firms based on their alphabetical appearance in the database. These firms are active across the country's provinces and represent all sectors of Canada's economy. For each firm, we obtained contact information about managers whose job title indicated that they worked either in a "technically oriented" function (i.e., engineering, operations, or R&D) or a "commercially oriented" one (i.e., marketing or sales). Although this specification does not span all possible functional areas, extant research points to the critical role of these functional areas in shaping a firm's entrepreneurial endeavors (e.g., Griffin & Hauser, 1996; Li & Calantone, 1998; Song & Parry, 1993). The key issues we investigate—the challenges and opportunities of intrafirm collaboration for EO formation—should be particularly salient for managers who operate in these areas. To ensure that the contacted managers were knowledgeable about their firms' strategic postures and overall internal functioning, we included only managers who held either a vice president or director/department head title as possible participants. We then sent a survey instrument to one randomly selected manager per firm. This single-respondent design is similar to prior approaches (e.g., De Clercq et al., 2010; Simons & Peterson, 2000; Song, Dyer, & Thieme, 2006).

To pretest the survey and ensure that our questions were clear and understandable, we undertook informal interviews with three academics and three managers (not included in the final sample) before the actual administration of the final version. We asked them to point out ambiguous, vague, or unfamiliar terms, and incorporated their feedback to improve the study's readability and relevance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To minimize the possibility that their responses were subject to biases due to social desirability, acquiescence, or consistency with "assumed" research hypotheses, we guaranteed the participants complete confidentiality, repeatedly assured them during the survey that there were no right or wrong answers, and asked them to answer the questions as honestly as possible (Spector, 2006). According to Podsakoff et al., these measures should help alleviate concerns with respect to common method bias (we also conducted formal statistical tests of common method bias, as we describe subsequently).

For the data collection, we followed the total design method suggested by Dillman (1978). First, we prepared a mailing packet that contained (1) a cover letter addressed personally to the targeted managers of the sampled firms, (2) a questionnaire, and (3) a postage-paid return envelope. Second, 2 weeks after the initial mailing, we conducted "thank you" calls to those who had responded and reminder calls to those who had not. Third, 4 weeks after the initial mailing, we sent replacement questionnaires to nonrespondents. Some initially selected firms were unfit for the final sample because they were not active anymore, had moved and their new address could not be identified, or no longer employed the selected respondents. We ended up with 950 potential respondents and received 232 completed surveys, for a response rate of 24%. The average firm size is 2,655 employees, and the average firm age is 33 years; the participating firms belong to the following industries: manufacturing (47%), mining (9%), construction (2%), transportation (6%), wholesale (4%), retail (3%), and services (29%). We did not find significant differences between respondents and nonrespondents in terms of firm size, firm age, industry distribution, or location (province) distribution, nor did we find significant

differences between early and late respondents for the survey-collected dependent, independent, or control variables (Armstrong & Overton, 1977).

A follow-up survey, conducted 6 months after the initial one, used a shortened format and was sent to the original respondents. Specifically, for each construct, we chose one proxy item, different from the specific items in the original survey, that best captured the general content domain of the construct (De Clercq & Sapienza, 2006; Yli-Renko et al., 2001). For example, to measure trust, we asked “to what extent are relationships between technically and commercially oriented functions marked by strong trust?” This approach reduces recall and consistency bias, and enhances confidence that positive and significant correlations between original and follow-up survey items can be interpreted as evidence of the absence of common method bias (Yli-Renko et al.). We received 78 responses; all validation items correlated positively with the original measures, as we report subsequently. Further, we did not find significant differences between firms that responded to the follow-up survey and those that did not for the dependent, independent, or control variables captured in the original survey; thus, attrition bias between the first and second surveys should not be a concern.

Measures

The scales used to measure the constructs came from extant literature. All items were measured on 5-point Likert scales, ranging from 1 (strongly disagree) to 5 (strongly agree). We summarize the study’s key measures along with their psychometric properties in Table 1, and we include the correlations and descriptive statistics of these key measures in Table 2. In line with our research focus and similar approaches that assessed firm-level phenomena based on individual-level responses (e.g., De Clercq et al., 2010; Song et al., 2006), the questions in the survey were worded to capture attitudes and behaviors that take place at the firm level rather than at the level of the individual manager (Whetten et al., 2009). Thus, for the questions with respect to internal knowledge sharing and organizational social capital, the respondents provided their opinions about the interactions and relationships between their firms’ technically and commercially oriented functions *in general*—irrespective of whether these interactions and relationships operated at a particular hierarchical level or spanned different levels—rather than the perspective of their own individual situation. As noted previously, our focus on these two broad function types follows arguments about their critical role in fostering firm-level entrepreneurship or innovation (De Luca & Atuahene-Gima, 2007; Griffin & Hauser, 1996; Song & Parry, 1993).²

EO. We measured the firm’s entrepreneurial orientation using Miller’s (1983) 7-item scale that captures its levels of innovation (e.g., introduction of new products), risk taking (e.g., tolerance for high-risk projects), and proactiveness (e.g., bold, wide-ranging strategic actions rather than minor tactical changes). The measure ($\alpha = .81$) correlated with its single-item counterpart from the follow-up survey ($r = .53, p < .001$).

2. To ensure that the responses would cover organization-wide phenomena rather than idiosyncratic issues that have to do with specific departments, in the cover letter and survey instrument we defined these “function” types in a broad sense. Particularly, we clarified that we were not interested in investigating interactions or relationships between specific departments, but rather between “the managers who typically are most preoccupied with technological (or technical) issues such as operations, engineering, or research and development on one hand, and those who are typically most preoccupied with commercial activities such as marketing or sales on the other.”

Table 1

Constructs and Measurement Items

	Factor loading	t-value
Entrepreneurial orientation ($\alpha = .81$; CR = .86; AVE = .51)		
My company spends more time on long-term R&D (3+ years) than on short-term R&D.	0.733	9.160
My company is usually among the first in the industry to introduce new products.	0.684	10.526
My company rewards risk taking.	0.715	10.786
My company shows a great deal of tolerance for high-risk projects.	0.700	10.424
My company uses only “tried-and-true” procedures, systems, and methods. [‡]	0.636	9.475
My company challenges, rather than responds to, its major competitors.	0.718	11.469
My company takes bold, wide-ranging strategic actions rather than minor changes in tactics.	0.821 [†]	—
Internal knowledge sharing ($\alpha = .95$; CR = .95; AVE = .72)		
There is close interaction and collaboration between people in the two functions.	0.847	17.423
There is open communication between people in the two functions.	0.835	16.634
There is a high level of knowledge sharing between people in the two functions.	0.864 [†]	—
People in the two functions have great dialogues with each other.	0.853	17.496
People in the two functions regularly communicate with each other.	0.809	15.578
People in the two functions provide each other with a lot of feedback.	0.860	17.288
There is a lot of two-way communication between people in the two functions.	0.875	18.171
Trust ($\alpha = .88$; CR = .90; AVE = .64)		
People from the other function can always be trusted to do what is right for us.	0.804 [†]	—
People from the other function always keep the promises they make to us.	0.738	11.546
People from the other function are perfectly honest and truthful with us.	0.894	12.994
People from the other function are truly sincere in their promises.	0.851	11.722
People from the other function would not take advantage of us, even if the opportunity arose.	0.705	10.950
Goal congruence ($\alpha = .86$; CR = .86; AVE = .62)		
People in the two functions share a similar vision regarding the company’s future.	0.834	14.250
People in the two functions think alike on most issues.	0.808 [†]	—
Most of our objectives are fully aligned with those of the other function.	0.838	14.426
Both functions perceive their problems as mutual problems.	0.648	10.431
Formalization ($\alpha = .84$; CR = .84; AVE = .52)		
There are written procedures and guidelines for most working situations.	0.721	9.922
Written documents, such as budgets, plans, and schedules, are important guides to how we do things.	0.741 [†]	—
Performance appraisals are based on written performance standards.	0.647	8.921
Duties, authority, and accountability of personnel are documented in policies, procedures, or job descriptions.	0.704	9.429
There are established, formal communication channels.	0.773	10.614

[†] Initial loading was fixed to 1 to set the scale of the construct.

[‡] Reverse-coded item.

CR, construct reliability; AVE, average variance extracted; R&D, research and development.

Internal Knowledge Sharing. The measure of internal knowledge sharing combined items adapted from prior research on intrafirm (Song, Montoya-Weiss, & Schmidt, 1997) and interfirm (Mohr & Nevin, 1990) relationships. For example, respondents indicated whether managers communicated openly and whether such communication occurred in two directions. The measure ($\alpha = .95$) correlated with its single-item counterpart ($r = .50$, $p < .001$).

Trust. The trust items were adapted from previous research on interfirm trust (De Clercq & Sapienza, 2006; Yli-Renko et al., 2001) and captured the presence of “goodwill” trust (Rousseau et al., 1998). Example items included the belief that colleagues in other functions would not take advantage of them, even if the opportunity arose, and were truly

Table 2
Descriptive Statistics and Correlations (N = 232)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Entrepreneurial orientation	.345														
2. Internal knowledge sharing	.319	.583													
3. Trust	.344	.666	.724												
4. Goal congruence	.216	.217	.310	.155											
5. Formalization	.086	-.049	.039	.062	.174										
6. Firm size	-.198	-.030	.059	.000	.171	.304									
7. Firm age	-.015	.152	.092	.102	.073	.041	.091								
8. Industry: manufacturing	.081	-.194	-.063	-.008	-.183	.051	-.100	-.307							
9. Industry: mining	.164	.140	.121	.090	.078	-.006	.046	-.126	-.043						
10. Industry: construction	-.061	-.017	.011	-.023	.007	-.032	.014	-.231	-.079	-.032					
11. Industry: transportation	.064	.098	.062	.107	.002	-.049	-.084	-.191	-.065	-.027	-.049				
12. Industry: wholesale	-.102	-.040	-.051	-.008	.016	.102	.345	-.155	-.053	-.022	-.064	-.040			
13. Industry: retail	.086	-.002	.035	-.036	.069	.128	.040	.071	.000	-.024	-.064	-.105	-.140		
14. Vice-president level	-.080	.001	.071	-.068	.137	.126	.193	.034	-.083	.069	-.015	.026	.003	.012	
15. Commercial function	3.11	3.46	3.38	3.29	3.28	2655	32.87	0.47	0.09	0.02	0.06	0.04	0.03	0.59	0.49
Mean	0.75	0.89	0.79	0.86	0.88	9735	36.31	0.50	0.29	0.13	0.23	0.19	0.16	0.49	0.50
Standard deviation	1.14	1.00	1.00	1.00	1.00	3.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minimum	4.71	5.00	5.00	5.00	5.00	82,000	337.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum															

Notes: Correlations greater than 1.141 are significant at $p < .05$.

sincere in their promises. The measure ($\alpha = .88$) correlated with its single-item counterpart from the follow-up survey ($r = .36, p < .01$).

Goal Congruence. The goal congruence items were adapted from interfirm research (De Clercq & Sapienza, 2006; Yli-Renko et al., 2001) and captured the extent to which objectives were fully aligned across functions and managers shared a similar vision regarding their firm's future. The measure ($\alpha = .86$) correlated with its single-item counterpart ($r = .30, p < .01$).

Formalization. The formalization measure came from Dyer and Song (1998), and included the extent to which there were written procedures and guidelines for most working situations, as well as the extent to which the duties, authority, and accountability of personnel were documented in policies, procedures, or job descriptions. The measure ($\alpha = .84$) correlated with its single-item counterpart from the follow-up survey ($r = .54, p < .01$).

Control Variables. We included five variables to account for alternative explanations for variations in the firm's internal knowledge sharing and EO. First, *firm size* was the log transformation of the number of full-time employees. It reflects the firm's resource endowments (Mitchell, 1994) and, by extension, the availability of slack resources (Audia & Greve, 2006; Ruef & Scott, 1998), which are very relevant for managers' behaviors and the firm's entrepreneurial endeavors (Kuratko et al., 2005). Second, *firm age* assessed the number of years that the firm had been in business. Third, we controlled for the firm's *industry*, which captures systematic variations in growth opportunities. Fourth, we controlled for whether the respondent operated at the vice-presidential *level*. Fifth, we controlled for whether the respondent represented a technically or commercially oriented *function*.

Analysis and Results

Measurement Estimation

We undertook confirmatory factor analysis (CFA) of a five-factor measurement model. Each of the 28 observable indicators loaded significantly on their intended factors, indicating convergent validity among the items of each scale. The model's factor loadings were greater than .40, normalized residuals less than 2.58, and modification indices less than 3.84 (Anderson & Gerbing, 1988). This measurement model also fit the data well: $\chi^2_{(326)} = 388.72$, goodness-of-fit index (GFI) = .91, Tucker-Lewis index (TLI) = .97, confirmatory fit index (CFI) = .97, and root mean square error of approximation (RMSEA) = .04. The significant factor loadings ($t > 2.0$; Gerbing & Anderson, 1988) and the magnitude of the average variance extracted (AVE > .50; Bagozzi & Yi, 1988) provided evidence of the convergent validity of the scales. Further, there is strong evidence of discriminant validity because (1) significant differences were found between the unconstrained model and constrained model (Anderson & Gerbing) for all ten pairs of constructs, (2) none of the confidence intervals for the correlations between these construct pairs included 1.0 ($p < .05$) (Anderson & Gerbing), and (3) the AVE estimates of the constructs were greater than the squared correlations between corresponding pairs of constructs (Fornell & Larcker, 1981).³

3. Concerns about discriminant validity may be most salient among the internal knowledge sharing, trust, and goal congruence constructs, so we also compared the statistical fit of three nested models: (1) a three-factor

We conducted several diagnostic analyses to rule out common method bias. First, a CFA for a single-factor model revealed poorer fit with the data ($\chi^2_{(336)} = 1,602.04$, GFI = .59, TLI = .66, CFI = .69, RMSEA = .13)—significantly worse ($\Delta\chi^2_{(10)} = 1,213.32$, $p < .001$) than the fit of the aforementioned five-factor model—so common method bias did not appear to be a serious concern. Second, similar to previous studies that relied on individual common source data to investigate organization-level entrepreneurship or innovation (e.g., Camarero & Garrido, 2012; De Clercq et al., 2010; Song et al., 2006), and following Podsakoff et al.'s (2003) recommended approach to test for common method bias, we compared the statistical fit of a path model that included all hypothesized relationships (which we detail in the Hypothesis Testing section) with a parallel model that contained an additional common method factor. This chi-square analysis revealed no significant difference in fit ($\Delta\chi^2 = .06$, $\Delta df = 1$, ns) between the hypothesized model ($\chi^2_{(100)} = 139.63$) and the model that included the common method factor ($\chi^2_{(99)} = 139.57$). In addition, we observed only small changes in the size and significance of the paths across the two models. These findings provided further evidence that common method bias was not a great concern (Podsakoff et al.). Third, we applied the CFA marker technique (Williams, Hartman, & Cavazotte, 2010), which requires the estimation and comparison of a baseline model with the Method-C (or non-congeneric) model and Method-U (or congeneric) model as a means to test for the presence of common method variance (see Williams et al., p. 494, for a detailed explanation of the specification of these models). Using a 2-item measure of respondents' organizational experience (which captures their organizational tenure and job tenure) as the theoretically unrelated marker variable, we found that the fit statistics for the two method models were not statistically better than those for the baseline model. Rather, there were no significant differences in fit between the baseline model ($\chi^2_{(382)} = 479.07$) and either the Method-C model ($\chi^2_{(381)} = 479.05$; $\Delta\chi^2 = .02$, $\Delta df = 1$, ns) or the Method-U model ($\chi^2_{(354)} = 441.62$; $\Delta\chi^2 = 37.45$, $\Delta df = 28$, ns) when we tested for the presence of equal or unequal method effects, respectively. Therefore, the CFA marker analysis offered no evidence of an influence of common method variance on the relationships among the five principal constructs in our hypothesized model. Fourth, common method bias is less salient in studies that include highly educated respondents and multi-item scales (Bergkvist & Rossiter, 2007). In all, these considerations alleviate concerns related to the use of single respondents.

Hypotheses Testing

We used regression analysis to test the hypotheses. For the direct effect hypotheses (hypotheses 1, 2a–b, 4, and 6), we regressed internal knowledge sharing and EO on the independent and control variables. The mediation hypothesis (hypothesis 3) was tested with the Sobel test to determine the significance of the *indirect* effects of trust and goal congruence on EO through internal knowledge sharing (MacKinnon, Warsi, & Dwyer, 1995; Sobel, 1982). For the moderating effect hypotheses (hypotheses 5a–b and 7), we used moderated regression analysis. To minimize the threat of multicollinearity, we calculated the interaction terms by multiplying their corresponding mean-centered components (Aiken & West, 1991).

model including internal knowledge, trust, and goal congruence separately; (2) a two-factor model including internal knowledge sharing and a combination of trust and goal congruence; and (3) a one-factor model that combines the three constructs. The fit of the three-factor model was superior to that of the two-factor model ($\Delta\chi^2(2) = 96.9$, $p < .001$) and the one-factor model ($\Delta\chi^2(3) = 530.1$, $p < .001$), indicating discriminant validity.

To check the robustness of the regression results, we also ran a path analysis, which enabled us to investigate how well our conceptual model as a whole fit the data, as well as test a set of hypotheses that include both mediation effects and multiple interactions (Edwards & Lambert, 2007; Muller, Judd, & Yzerbyt, 2005). We followed Ping's (1996) method for testing multiple interactions through path analysis, which combines the items of each construct into a single indicator (Bollen, 1989), calculates the interaction terms as the product of these indicators, and models the measurement error for each construct according to the loadings and error variances obtained from the aforementioned five-factor measurement model. The use of aggregate indicators to test multiple interaction effects resolves the nonlinearity estimation difficulties associated with calculating all possible product terms for items that load on the interacting constructs, an issue that becomes exacerbated when testing for multiple interactions with constructs (i.e., formalization) in common (Ping). Similar to the regression analysis, we calculated the interaction terms as the products of the corresponding mean-centered components (Aiken & West, 1991; Jaccard & Wan, 1996). The direct and moderating effect hypotheses were tested by assessing the significance of the corresponding paths; the mediation hypothesis was tested with a nested-model approach (Anderson & Gerbing, 1988).

Results

Regression Analysis. We provide the results of the regression analysis in Table 3. Models 1–3 predicted internal knowledge sharing, and Models 4–6 predicted EO. Models 1 and 4 included the control variables only; Models 2 and 5 added the direct effects; and Models 3 and 6 added the moderating effects. For each model, the variance inflation factor values were less than 10, which suggested that multicollinearity was not a problem (Aiken & West, 1991).

Hypothesis 1 predicted that firms with higher internal knowledge sharing exhibit a higher EO. We found support for this hypothesis in Model 5 ($\beta = .166, p < .05$). Further, we found support for hypotheses 2a and 2b in Model 2: The level of internal knowledge sharing was higher among firms that exhibited higher levels of trust ($\beta = .174, p < .05$) and goal congruence ($\beta = .538, p < .001$). To test the mediation effect of hypothesis 3, we undertook a Sobel test (Baron & Kenny, 1986; MacKinnon et al., 1995; Sobel, 1982) to calculate the indirect effect of trust and goal congruence on EO through internal knowledge sharing, according to the relationships between the independent variables and the mediator (Model 2), and between the mediator and the dependent variable (Model 5). The indirect effect of trust was significant at $p < .10$, whereas that of goal congruence was significant at $p < .05$, in support of the mediating effect of internal knowledge sharing between the two organizational social capital variables and EO.⁴

Model 2 showed a positive relationship between formalization and internal knowledge sharing ($\beta = .090, p < .10$), in support of hypothesis 4, although the effect was relatively weak. In turn, we found mixed support for the moderating effects of formalization on the relationship between the two organizational social capital dimensions and

4. Following Baron and Kenny (1986), we also compared the effects of trust and goal congruence on EO when accounting for the effect of internal knowledge sharing (Table 3, Model 5) with the corresponding effects in a base model (not reported in Table 3) without internal knowledge sharing. Although trust was not significantly related to EO in this base model—which prevents mediation testing for trust—goal congruence was ($\beta = .199, p < .01$). This significant effect of goal congruence disappeared ($\beta = .110, ns$) in Model 5, in strong support of the *full* mediation of internal knowledge sharing between goal congruence and EO.

Table 3

Regression Analysis Results (N = 232)

	DV = internal knowledge sharing			DV = entrepreneurial orientation		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Firm size (log)	-.061 ⁺	-.066**	-.062*	.051 ⁺	.046	.047 ⁺
Firm age	.000	.000	.000	-.005**	-.006***	-.005***
Industry: manufacturing [†]	.316*	.114	.121	.070	-.027	-.012
Industry: mining	-.387 ⁺	-.438**	-.409**	.214	.327*	.347
Industry: construction	1.139**	.516	.408	1.077**	.693*	.750*
Industry: transportation	.157	.066	.051	-.127	-.162	-.189*
Industry: wholesale	.577*	.144	.171	.306	.106	.119
Industry: retail	.006	-.029	-.022	.015	.025	.040
Vice-president level [‡]	.064	.071	.076	.112	.100	.080
Commercially oriented function [§]	-.018	.032	.045	-.096	-.101	-.106
Trust		.174*	.171*		.067	.084
Goal congruence		.538***	.536***		.110	.081
Formalization		.090 ⁺	.094 ⁺		.138*	.126*
Trust × formalization			.172*			
Goal congruence × formalization			-.162*			
Internal knowledge sharing					.166*	.149*
Internal knowledge sharing × formalization						-.117*
F-value	2.434**	18.358***	16.399***	2.641**	5.642***	5.685***
R-square	.099	.523	.532	.107	.267	.283

Notes: Unstandardized estimates ⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

[†] Base case = services industry.

[‡] Base case = director/department head.

[§] Base case = technically oriented function.

DV, dependent variable.

internal knowledge sharing: Model 3 provided evidence for the expected negative interaction between goal congruence and formalization ($\beta = -.162$, $p < .05$), but also indicated a counterintuitive positive interaction between trust and formalization ($\beta = .172$, $p < .05$). Thus, hypothesis 5b was supported, but hypothesis 5a was not. To better understand the nature of these interactions, we plotted the effects of trust and goal on internal knowledge sharing for high and low levels of formalization in Figure 2, panels A and B (Aiken & West, 1991). The plots suggested that the trust–internal knowledge sharing relationship was stronger with high formalization, whereas the goal congruence–internal knowledge sharing relationship was stronger with low formalization.

Model 5 indicated a contrary finding for hypothesis 6 in that there was a positive rather than a negative relationship between formalization and EO ($\beta = .138$, $p < .05$). The interaction effect between internal knowledge sharing and formalization in predicting EO was in line with what we expected: The instrumentality of internal knowledge sharing for enhancing EO was attenuated at higher levels of formalization ($\beta = -.117$, $p < .05$). The plot in Figure 2, panel C, depicts this interaction effect. Thus, hypothesis 7 was supported.

Path Analysis. To corroborate the regression results, we also undertook a path analysis, in which we tested all the hypothesized effects simultaneously. The results reported in

Figure 2

Moderating Effects of Formalization on (A) Trust–Internal Knowledge Sharing Relationship; (B) Goal Congruence–Internal Knowledge Sharing Relationship; (C) Internal Knowledge Sharing–Entrepreneurial Orientation Relationship

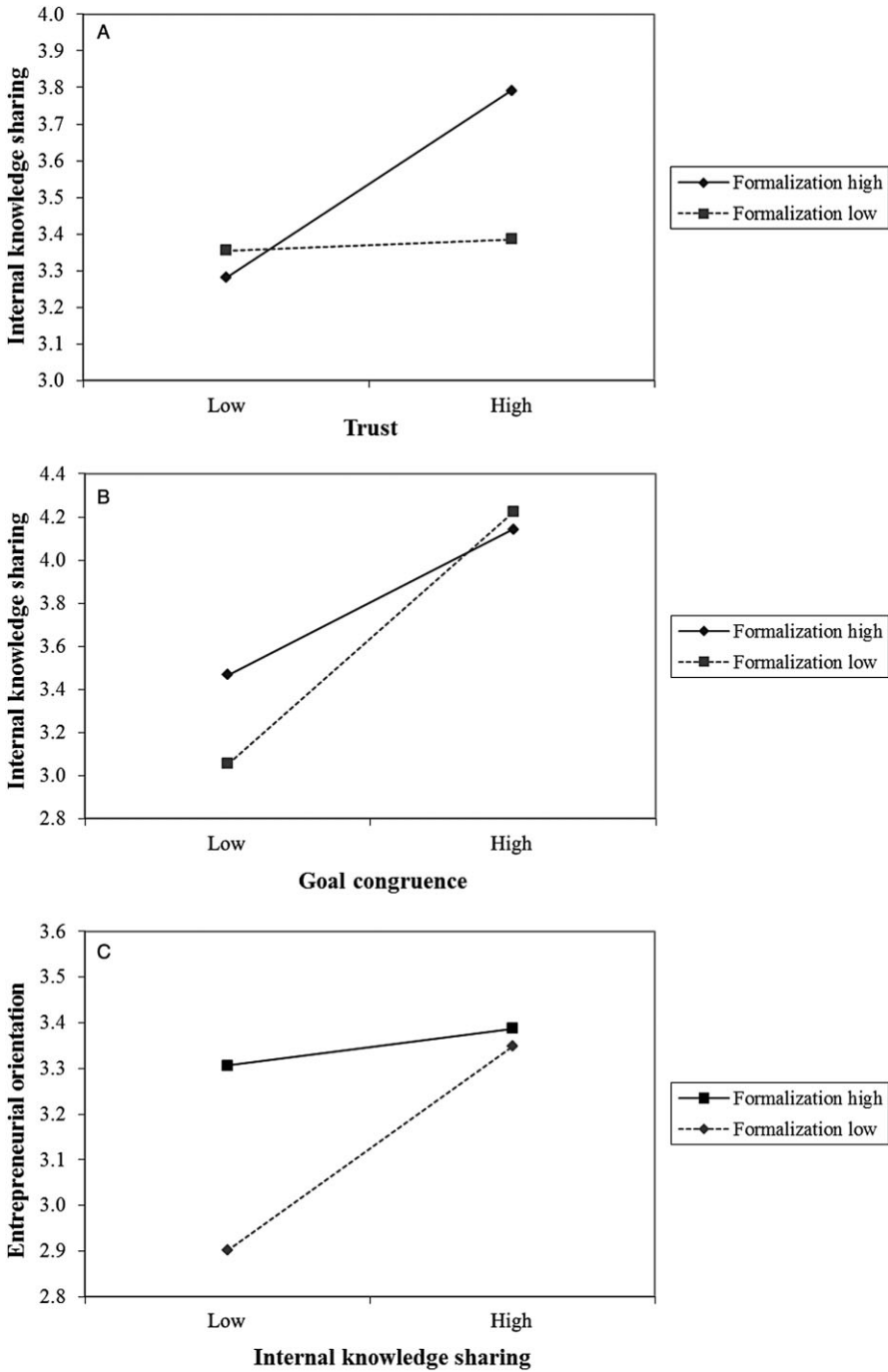


Table 4 are consistent with those found in Table 3. In Model 1, the overall fit of the hypothesized framework was acceptable ($\chi^2_{(100)} = 139.63$, GFI = .94, TLI = .94, CFI = .96, and RMSEA = .04), and its fit was significantly better than that of the null model ($\Delta\chi^2_{(53)} = 1,107.06$, $p < .001$). All eight hypothesized direct and moderating effect paths, reported in the top half of Table 4, were statistically significant, with six paths following the hypothesized directions and two paths in the opposite directions. There was a positive relationship between internal knowledge sharing and EO ($\beta = .284$, $p < .01$), positive relationships of trust and goal congruence with internal knowledge sharing ($\beta = .155$, $p < .05$; $\beta = .529$, $p < .01$, respectively), and a (weak) positive relationship between formalization and internal knowledge sharing ($\beta = .096$, $p < .10$). In terms of the interaction between the two organizational social capital variables and formalization, we uncovered mixed support, as was the case in the regression analysis: Formalization negatively moderated the relationship between goal congruence and internal knowledge sharing ($\beta = -.167$, $p < .05$) but positively moderated the relationship between trust and internal knowledge sharing ($\beta = .161$, $p < .05$). Finally, we found that the direct relationship between formalization and EO was positive rather than negative ($\beta = .168$, $p < .01$), contrary to expectations, and that the positive relationship between internal knowledge sharing and EO was weaker at higher levels of formalization ($\beta = -.145$, $p < .05$).

The path analysis also provided support for the mediating role of internal knowledge sharing. To test such mediation, we compared the fit of three models in Table 4: the hypothesized full mediation model (Model 1); the partial mediation model that integrates the direct effects of the two organizational social capital variables, as well as the effects of their interactions with formalization on EO (Model 2); and the direct model that includes the direct effects of the two organizational social capital variables (and their interactions with formalization) on internal knowledge sharing and EO, but not the effect of internal knowledge sharing (nor its interaction with formalization) on EO. We used a two-step approach recommended by previous research (Anderson & Gerbing, 1988; Sapienza & Korsgaard, 1996). First, the partial mediation model (Model 2) offered a significantly better fit than the direct model (Model 3; $\Delta\chi^2$ [df = 2] = 6.80, $p < .05$), which confirmed that the level of internal knowledge sharing represented a critical mediating mechanism that connected organizational social capital with EO. Second, the fit of the more constrained, more parsimonious full mediation model (Model 1) was *not* significantly worse than that of the less constrained, more complex partial mediation model (Model 2; $\Delta\chi^2$ [df = 4] = 5.36, ns), which indicated that Model 1 was the preferred model: Internal knowledge sharing fully mediated the relationship between the firm's organizational social capital (and interactions with formalization) and EO.⁵

Discussion

To determine how firms can leverage their internal social capital to enhance their EO, we examine the roles of internal knowledge sharing and formalization. We, thus, extend entrepreneurship research that has mostly looked at the influence of external social capital

5. To test the individual mediation effect of internal knowledge sharing for trust and goal congruence, we ran two additional models (not reported) that included paths from trust to EO or from goal congruence to EO (Anderson & Gerbing, 1988). These less constrained models did not offer significantly better fit than the more parsimonious, hypothesized Model 1 (trust $\Delta\chi^2$ [df = 1] = 3.68, ns; goal congruence $\Delta\chi^2$ [df = 1] = 3.62, ns). That is, internal knowledge sharing mediated the relationships between each of the two organizational social capital variables and EO.

Table 4

Path Analysis Results (N = 232)

	Model 1 (full mediation)	Model 2 (partial mediation)	Model 3 (direct model)
Effects on internal knowledge sharing (independent and moderating variables)			
Trust	.155*	.155*	.155*
Goal congruence	.529**	.529**	.529**
Formalization	.096 [†]	.096 [†]	.096 [†]
Trust × formalization	.161*	.161*	.161*
Goal congruence × formalization	-.167*	-.167*	-.167*
Effects on EO (independent and moderating variables)			
Internal knowledge sharing	.284**	.168*	
Formalization	.168**	.151*	.163*
Internal knowledge sharing × formalization	-.145*	-.119	
Trust		.087	.097
Goal congruence		.098	.206*
Trust × formalization		.060	.038
Goal congruence × formalization		-.086	-.160 [†]
Effects on internal knowledge sharing (control variables)			
Firm size (log)	-.139*	-.139*	-.139*
Firm age	-.010	-.010	-.010
Industry: manufacturing [†]	.070	.070	.070
Industry: mining	-.138**	-.138**	-.138**
Industry: construction	.061	.061	.061
Industry: transportation	.014	.014	.014
Industry: wholesale	.038	.038	.038
Industry: retail	-.004	-.004	-.004
Vice-president level [‡]	.043	.043	.043
Commercially oriented function [§]	.026	.026	.026
Effects on EO (control variables)			
Firm size (log)	.129 [†]	.124 [†]	.094
Firm age	-.247**	-.255**	-.259**
Industry: manufacturing [†]	.001	-.007	.000
Industry: mining	.160*	.138*	.104 [†]
Industry: construction	.136*	.126*	.139*
Industry: transportation	-.055	-.061	-.057
Industry: wholesale	.040	.033	.037
Industry: retail	.008	.010	.014
Vice-president level [‡]	.050	.055	.066
Commercially oriented function [§]	-.075	-.068	-.062
Fit indices			
χ^2 (df)	139.63 (100)	134.27 (96)	141.07 (98)
GFI	.94	.94	.94
TLI	.94	.94	.94
CFI	.96	.97	.96
RMSEA	.04	.04	.04

Notes: Standardized estimates [†] $p < .10$, * $p < .05$, ** $p < .01$.

[†] Base case = services industry.

[‡] Base case = director/department head.

[§] Base case = technically oriented function.

EO, entrepreneurial orientation; GFI, goodness-of-fit index; TLI, Tucker-Lewis index; CFI, confirmatory fit index; RMSEA, root mean square error of approximation.

on entrepreneurial outcomes, rather than the social capital that resides within the firm (e.g., Davidsson & Honig, 2003; Lechner et al., 2006; Parker, 2011; Wiklund & Shepherd, 2008). Further, the prominence of formalization in our conceptual framework extends previous research on organizational social capital (Tsai & Ghoshal, 1998) by showing that the influence of such social capital on entrepreneurial outcomes cannot be determined in isolation from the broader internal structural environment in which the social capital operates.

Effects on EO

We find support for the premise that firms with higher levels of internal knowledge sharing exhibit higher EO levels, yet the contribution of such knowledge flows varies significantly depending on the level of formalization. Intensive knowledge sharing becomes more effective for EO at *low* levels of formalization because in such conditions the firm's managers may enjoy greater flexibility in deciding how to use the combination of their own knowledge bases with those of colleagues in other functional areas creatively to exploit entrepreneurial opportunities (Kuratko et al., 2005; Miller, 1987). In contrast, with *high* formalization, it is more likely that knowledge sharing routines become ritualized (Miller), and managers' collective knowledge bases are scrutinized to a lesser extent, such that it becomes more difficult to channel knowledge sharing across functions into entrepreneurial activities.

Contrary to what we expected, we find a direct positive, instead of negative, effect of formalization on EO. Several explanations are possible. First, to the extent that the firm's written procedures help formalize the more routine aspects of managers' daily work, high formalization might help them focus their efforts on the implementation of novel ideas (Adler & Borys, 1996). Second, formalized structures may not be effective in the generation of novel ideas, but they can facilitate their implementation (Pierce & Delbecq, 1977), particularly in terms of playing a disciplining role and focusing managers' attention on the application of entrepreneurial ideas (Gibson & Birkinshaw, 2004; Kang & Snell, 2009). Third, to the extent that formal procedures, plans, and policies provide insights into how the firm's current activity set can be improved (Adler & Borys), they might reduce the uncertainty typically associated with entrepreneurial behaviors. Thus, increased formalization might, somewhat paradoxically, reduce the causal ambiguity between the sources and outcomes of such behaviors (Briscoe, 2007).

Effects on Internal Knowledge Sharing

As we expected, the two aspects of organizational social capital, trust, and goal congruence, positively affect the level of internal knowledge sharing (Tsai & Ghoshal, 1998), and internal knowledge sharing mediates the relationship between organizational social capital and EO. Because both organizational social capital and formalization decrease the uncertainty of managerial interactions, we anticipated that they would substitute for each other, such that the instrumentality of organizational social capital for enhancing internal knowledge sharing should be stronger with high formalization. Although we find empirical support for the case of goal congruence, trust and formalization *complement* rather than substitute for each other in predicting internal knowledge sharing.

A possible explanation for this contrary finding in the case of trust is that high levels of trust imply a danger that the actions of colleagues will be taken for granted, so

managers feel less compelled to engage in intensive knowledge exchanges, *unless* formal mechanisms already in place facilitate those exchanges (Baron, Vandello, & Brunzman, 1996; Dyer & Song, 1998). The danger of complacency associated with high trust levels (Uzzi, 1997; Yli-Renko et al., 2001) might decrease its incremental benefits for enhanced intensive knowledge sharing in conditions of *low* formalization because managers have fewer “tools” available to interact intensively with one another (Adler & Borys, 1996), especially if such interactions seem to question others’ benign intentions or appear as violations of trust (Lewicki & Bunker, 1996; Raub & Weesie, 1990). Unless such questioning can be “blamed” on the presence of formalized structures, the level of knowledge sharing will be subdued.

An interesting insight that arises from this study then is that in firms marked by *low* formalization, the desire to be perceived as a trustworthy team player and the associated tendency to avoid hurting the feelings of trusted colleagues might decrease the instrumentality of trust-based relationships for internal knowledge sharing and subsequent EO. Conversely, at high levels of formalization, managers who trust one another may be particularly motivated to share their knowledge because such exchanges are interpreted not as criticisms of (trusted) colleagues but rather as adherence to established organizational procedures (Adler & Borys, 1996).

Limitations and Future Research

This study contains some limitations that offer avenues for further research. First, our empirical focus on the interaction between technically and commercially oriented functions does not cover all functional areas that might contribute to a firm’s entrepreneurial undertakings, although they encompass areas that arguably play salient roles (Griffin & Hauser, 1996; Song & Parry, 1997). Therefore, researchers could consider a more comprehensive set of functions than addressed herein.

Second, our single-respondent design might raise some concerns about common method bias, despite the many cautionary measures taken in the research design and the reported statistical evidence against its presence. Nevertheless, researchers could collect data from multiple respondents in each firm, particularly to measure the firm’s internal knowledge sharing and social capital, which entail exchanges between at least two parties. Our firm-level focus also ignored the possibility of intrafirm variation with respect to the level of social capital across individual managers, which might in turn relate to their cognitive characteristics (De Carolis et al., 2009), such that structural features, such as formalization, might work differently for different managers. Following Leana and van Buren (1999), we treated organizational social capital as a firm-level construct, reflecting the perceptions of individual managers about the *collective* shared trust and goal orientation in their firm. Yet this conceptualization does not fully acknowledge that internal relationship building is a phenomenon that takes place between individual managers first (Nahapiet & Ghoshal, 1998; Rousseau, 1985). Additional research might explore the mechanisms that connect the individual with the organizational level (Whetten et al., 2009), such as how managers who function as internal network brokers (Brass et al., 2004) enable interpersonal trust or goal congruence to become a collective orientation toward trust and goal sharing across the organization’s ranks. In the same vein, further research could apply multilevel approaches to examine how social capital operates at the individual, departmental, and organizational levels, as well as how interplays across levels influence the firm’s entrepreneurial actions (Payne et al., 2011).

Third, by focusing on one specific dimension of organizational structure (formalization), we may have ignored other structural features that are also relevant for the

successful conversion of organizational social capital into internal knowledge sharing and subsequent EO, such as the extent to which managers enjoy high levels of decision autonomy (Fisher, Maltz, & Jaworski, 1997). Our focus on trust and goal congruence also excluded the role of *structural* aspects of organizational social capital, such as structural holes and weak ties (Burt, 1992; Hansen, 1999). Additional research could investigate how such structural social capital interacts with the characteristics of the firm's organizational structure overall (e.g., formalization) to inform EO. Our study also did not include other relevant variables that might affect EO, such as past performance or top management characteristics, nor did it explicitly model the extent to which knowledge combinations that arise from cross-functional knowledge sharing are imbued with external market insight, such as through interfirm relationships (Brass et al., 2004; Harrigan, 1985). Nonetheless, perhaps combinations of knowledge from various functional areas in conditions of high internal knowledge sharing increase the odds that, all else being equal, external market conditions will have been taken into account by at least one functional area.

Fourth, we focused on the level of internal knowledge sharing in general, which means we omitted some useful distinctions, such as explicit versus tacit (Levin & Cross, 2004; Nonaka, 1994), or declarative versus procedural (Berge & van Hezewijk, 1999; Moorman & Miner, 1998) knowledge. Future research could explore whether the interaction effects between organizational social capital and formalization might work differently in predictions of different facets of internal knowledge sharing. Similarly, it is possible that the moderating effect of formalization on the internal knowledge sharing–EO relationship varies across different dimensions of EO, such that the attenuating influence of formalization may be more important for the internally focused dimension of risk taking than for the externally focused dimension of proactiveness.⁶

Practical Implications

From a practical perspective, this study suggests that to become more entrepreneurial, firms should promote intensive knowledge flows across different functional areas. Yet intensive knowledge flows, even when they provide a fertile ground for entrepreneurial action, may be challenging. In particular, high EO levels may be more difficult to attain when formalized procedures and systems limit the flexibility with which managers can critically evaluate the knowledge held by others, particularly in terms of how others' knowledge bases, in combination with their own, contribute to the development of innovative ideas, risky projects, or proactive entry into new markets (Floyd & Lane, 2000; Miller, 1983). Yet we also find, somewhat paradoxically, that formalization itself may promote EO directly, perhaps because formalized systems can provide "protection" against the uncertainty of entrepreneurial activities. Thus, to promote EO, making investments in formal procedures can be useful, yet only to the extent that such investments do not hamper the successful transformation of knowledge sharing across functional areas into the actual exploitation of entrepreneurial opportunities.

Our study further shows that the level of internal knowledge flows can be enhanced by social capital development across functional areas. Yet top management should acknowledge the contingent role that their firm's formalization levels can play, particularly in

6. A follow-up analysis using a seemingly unrelated regression that separated the dependent variable into the three components underlying EO did not reveal significant results though, likely because of the limited statistical power due to sample size. We are grateful to an anonymous reviewer for suggesting this analysis.

terms of the instrumentality of different dimensions of organizational social capital. In the absence of formalized procedures, the instrumentality of congruent goals across functions for fostering internal knowledge sharing becomes stronger. When cross-functional relationships are marked by high levels of trust, low formalization threatens the usefulness of trust because managers' heavy reliance on and loyalty to colleagues may decrease their incentive to engage in intensive interactions; without formalized systems, there is no "excuse" to do so. These opposing findings for the effects of trust and goal congruence in various conditions of formalization pose an interesting trade-off for firms that value high levels of social capital *and* high levels of structural informality, whereby decision making does not rely heavily on formal procedures, plans, or policies. Such informality increases the usefulness of common goals for enhancing internal knowledge flows, but it may also increase the danger of complacency and overreliance associated with extreme levels of trust (Uzzi, 1997; Yli-Renko et al., 2001). The incentive for managers to share knowledge decreases, which may ultimately lead to lower EO levels.

To conclude, this study directs greater attention to the effect of organizational social capital on the firm's EO, and particularly the roles of internal knowledge sharing and formalization in this process. We find that cross-functional knowledge sharing represents a critical channel through which organizational social capital affects EO, yet the boundary role of formalization is nuanced: High formalization increases the potency of trust to enhance internal knowledge sharing, while also mitigating the importance of goal congruence. High formalization also hinders the subsequent conversion of internal knowledge sharing into EO. We hope that these insights function as a catalyst for further investigations of how firms can translate their internal social capital into stronger competitive positions in the marketplace through their involvement in entrepreneurial endeavors.

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