A Capability Approach

To Interorganizational Innovation

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LIST OF ABBREVIATIONS

ACAP	Absorptive Capacity
ASAP	Association of Strategic Alliance Professionals
AVE	Average Variance Extracted
CMV	Common Method Variance
CFI	Comparative Fit Index
CR	Composite Reliability
CFA	Confirmatory Factor Analysis
df	Degree of Freedom
DC	Dynamic Capabilities Theory
EFA	Exploratory Factor Analysis
H	Hypothesis
IT	Information Technology
KBV	Knowledge Based View
KM	Knowledge Management
KNC	Knowledge Network Capability
LV	Latent Variable
NPD	New Product Development
PLS	Partial Least Squares
PACAP	Potential Absorptive Capacity
PCA	Principal Component Analysis
RACAP	Realized Absorptive Capacity
RBV	Resource Based View
SPSS	Statistical Package for the Social Science
SEM	Structural Equation Modeling
TMS	Transactive Memory Systems
TM	Transactive Memory Theory

SUMMARY

To address knowledge incongruences, firms are increasingly turning to strategic alliances as a means to access a wider pool of knowledge. However, firms find though they have the opportunity to access external knowledge, they do not possess the ability to successfully act on that knowledge. This research seeks to address the question "Why are only some alliances successful in creating innovations?" through the development of a model and associated hypotheses of collaboration based on knowledge management capabilities and relationship characteristics, as evidenced by innovation outcomes.

Using a capability-based framework, this research investigates (1) the outcomes of innovative performance and alliance satisfaction in collaborative relationships, (2) how knowledge capabilities serve as a means to produce these performance outcomes, and (3) the mediator role of relational trust between the knowledge capabilities and performance outcomes.

This research offers new insight into capability based inter-organizational collaboration by linking the independent, yet complementary, perspectives of the knowledge-based view of the firm and dynamic capabilities theory together with transactive memory theory. The results confirm that a firm's knowledge capabilities positively influence the success of interorganizational relationships at both a micro and macro level. Realized absorptive capacity promotes alliance performance directly, while a firm's potential absorptive capacity and knowledge networking capability are important preconditions of realized absorptive capacity and contribute to alliance performance indirectly.

I. INTRODUCTION

A. Overview

In the last decade a surge of interest in inter-organizational collaboration has been witnessed within a wide span of research fields. Scholars agree interorganizational collaboration has become a prominent way for firms to create value and gain competitive advantage (Doz & Hamel, 1998; Dyer & Singh, 1998; Powell, Koput, & Smith-Doerr, 1996; Teece, Pisano, & Shuen, 1997). Corresponding with the theoretical interest, a rise in use of supplier-buyer partnerships, outsourcing agreements, joint research projects, shared new product development and other forms of collaboration, or ***strategic alliances***, has been empirically documented. In an attempt to maneuver in an increasingly competitive environment, firms have been forced to rethink organizational boundaries as collaborative relationships with external partners become a cornerstone of competitive strategy (Gulati, 1998). This blurring of organizational boundaries can be seen across many industries and disciplines. Today's executives stress successful partnerships and more collaborative business models as organizational necessities (McKinsey & Company, 2010).

In the desire to create value and achieve competitive advantage, firms are increasingly turning to strategic alliances as a means to access a wider pool of resources, most commonly that of knowledge (Grant, 2002). Knowledge has been deemed to be one of, if not the, most strategically important intangisources of the firm (Grant, 1996a). Despite its importance, firms often face knowledge incongruences; gaps between their knowledge domain and knowledge need. These gaps are especially evident in an environment of innovation, where the very nature of the process is knowledge intensive and the outcomes are knowledge-driven (Von Krogh, Ichijo, & Nonaka, 2000). Companies are engaging in more collaborative innovation than ever as even the largest of firms are finding it

challenging to develop new products alone (Gassmann, Enkel, & Chesbrough, 2010). Due to the propensity of knowledge sharing and exploitation of knowledge, strategic alliances have been purported to promote innovativeness (Caloghirou, Kastelli, & Tsakanikas, 2004; Eisenhardt & Santos, 2002). Collaborative innovation has become a particular area of interest as the need for a greater amount of resources and knowledge to innovate has fueled a corresponding trend towards the formation of partnerships and alliances.

However, despite their popularity, alliances often fail. As many as 60% of alliances are considered to be "underperforming" (Bamford & Ernst, 2002) and statistics claim that 50% of alliances ultimately fail to reach their intended outcome (Kaplan, Norton, & Rugelsjoen, 2010). As suggested by their notably high rates of failure, alliances in the area of innovation are particularly challenging (De Man & Duysters, 2009; Sadowski & Duysters, 2008). The elements deemed to be crucial to success in innovation, such as partner goal/responsibility transparency, project flexibility and autonomy, and a free flow of information, are more difficult to accomplish within the context of alliances (Sivadas & Dwyer, 2000). While porous boundaries provide the *opportunity* for a firm to access the external knowledge flowing between organizations, they do not provide the *ability* to successfully act on that knowledge. A gap exists between the aspiration to collaborate and the ability of the organization to create value from those collaborations. To achieve desired performance outcomes, external collaboration must be complemented by internal capabilities (Kim & Inkpen, 2005; Powell et al., 1996). In this knowledge-driven environment, the ability to realize opportunities and achieve desired organizational outcomes is increasingly being determined by an organizations competency in managing both internal and external knowledge (Lane & Lubatkin, 1998; Zahra & George, 2002). Heterogeneous performance may be seen as a result of difference in knowledge bases and capabilities among firms.

Thus, the management of knowledge processes within and between firms has emerged as a major theme in innovation research (Jantunen, 2005). In particular, the utilization of knowledge management processes and the strategic management of the flow of knowledge between partners has become central to innovative success as innovation is increasingly conducted across organizational boundaries (Ahuja, 2000; Argote, McEvily, & Reagans, 2003; Jiang & Li, 2009). Although the study of alliances is well grounded, viewing alliances as conduits for innovation is a relatively new phenomenon. Firms are increasingly developing new products in collaborative environments in practice, yet academic research in the field is lacking (Emden, Calantone, & Droge, 2006; Rindfleisch & Moorman, 2001). External collaborations are now seen as necessary ways of doing business, and for many companies today, collaboration in innovation has become essential. Though the field is young, its importance is well acknowledged and the literature on collaborative innovation is rapidly growing (e.g. Carlson, Frankwick, & Cumiskey, 2011; Emden et al., 2006; Lane & Lubatkin, 1998; Mowery, Oxley, & Silverman, 2002; Powell et al., 1996; Rindfleisch & Moorman, 2001). This research seeks to advance this field by pinpointing, and then addressing, several key research gaps.

B. Gaps in Strategic Alliance Literature

Three different branches in recent alliance literature; namely, that of collaborative innovation, capability-based arguments, and the relational factors perspective, offer insight into the current field of work in addition to highlighting some key issues that need to be addressed in order to continue advancing research in this area. This section summarizes the core arguments of the three branches and highlights the crucial gaps that will be addressed in this study.

1. Collaborative Innovation

The literature has clearly demonstrated that innovation is not only a central component in gaining and sustaining a competitive advantage, but actually necessary for survival (Brown & Eisenhardt, 1995). Despite this urgency, a firm's new product development efforts are more often met with failure than success. Foundational models of innovation were created on the assumption that useful knowledge is scare and hard to find, while today many believe high quality knowledge to be widely distributed (Chesbrough, 2007). These traditional models acknowledged the usefulness of external knowledge, but suggested it took a supplemental role, whereas today both internal and external knowledge have been deemed to be crucial (Cohen & Levinthal, 1990; Dyer & Singh, 1998). In response, firms are increasingly pursuing innovation through the use of alliances in order to leverage external knowledge sources and supplement internal innovative activities (Amaldoss & Rapoport, 2005; Carlson et al., 2011; Faems, Van Looy, & Debackere, 2005). However, innovation-focused collaborations are especially prone to failure (Amaldoss & Rapoport, 2005; De Man & Duysters, 2009). A conflict between innovation and alliances can exist, in that aspects often deemed necessary for success in new product development are difficult to achieve in a collaborative environment (Sivadas & Dwyer, 2000).

While firms are increasingly pursuing innovation through collaborative environments in practice, academic research in the field is lacking (Emden et al., 2006; Rindfleisch & Moorman, 2001). Although the study of alliances is well grounded, viewing alliances as conduits for innovation is a relatively new phenomenon. Existing studies tend to focus on measures of learning as the ultimate outcome, failing to address value creation and firm and/or alliance performance (Inkpen, 2002; McEvily, Eisenhardt, & Prescott, 2004). However, learning is an *intermediate output* of collaboration, resulting in a lack of research into a key metric of interorganizational collaborations: innovation. To address the specific need expressed in the literature (e.g. Inkpen, 2002; McEvily et al., 2004) this research utilizes

the higher-order alliance performance outcomes of innovation and alliance effectiveness. Additionally, I will address whether or not these interorganizational collaborations are equally relevant for both radical and incremental innovation development.

GAP 1: Paucity of academic research on interorganizational new product development activity and the innovative outcomes of collaborative relationships.

2. Organizational Capabilities

Recent literature has increasingly applied a capability-based explanation for alliance failure and success. Amit and Schoemaker (1993) state that organizational capabilities refer to "a firm's capacity to deploy resources, usually in combination, using organizational processes, to affect a desired end". An organization's capabilities have proven to be a distinct source of value creation in alliances (Sarkar, Aulakh, & Madhok, 2009; Swaminathan & Moorman, 2009; Zahra & George, 2002). In fact, it is suggested that the capabilities approach may now be the predominant way of thinking about heterogeneity and sustained competitive advantage as they relate to interorganizational collaborations (Foss, 2011). As both theory and practice increasingly address the 'knowledge movement', a review of the literature has highlighted the significance of knowledge driven capabilities as possible factors in explaining heterogeneous performance (George, Zahra, Wheatley, & Khan, 2001; Inkpen, 2002; Meier, 2011). Knowledge capabilities have also come to the forefront in innovation research, as the innovative process has become increasingly learning and knowledge based (Jantunen, 2005).

Absorptive capacity, the ability of a firm to recognize, assimilate and apply external information (Cohen & Levinthal, 1990), has dominated the knowledge-based capability discussion. Yet, despite the popularity of the construct, it has been plagued by application and measurement issues. While the terms "capacity" or "capability" are frequently used in relation to absorptive capacity research, it is often

measured by proxies such as R&D spending and amount of knowledge transferred, versus as an ability or a process. This practice has become highly scrutinized and has led to reexamination of both the concept and measurement of absorptive capacity. Now commonly agreed to be a multifaceted construct, research still often fails to capture that nature and disagreement in measurement is still rampant. Additionally, although absorptive capacity is defined as the capability to acquire and apply knowledge, researchers often use the term (both theoretically and empirically) to exemplify acquisition only (Lane, Koka, & Pathak, 2006). The narrow focus of knowledge acquisition fails to paint a full (or realistic) portrait of a firm's knowledge capabilities. There have been repeated calls in the literature to capture a wider spectrum of knowledge capabilities (Griffith, Sawyer, & Neale, 2003; Meier, 2011) in addition to creating a better understanding of knowledge capabilities and their corresponding effects on performance (Doz & Hamel, 1998; Mowery et al., 2002).

GAP 2: Adequate capture of knowledge capabilities and their role in collaborative performance outcomes.

3. Relational Factors

The relational factors view distinguishes between transactional and relational exchanges, which can be thought of as two ends of a continuum. Transactional exchanges possess a short-term nature that lack interdependence whereas relational exchanges demonstrate long-term commitments and a desire to collaborate (Sheth & Shah, 2003; Whipple, Lynch, & Nyaga, 2010). These two types of relationships are separated by relational factors, such as trust, commitment and communication (Blomqvist & Levy, 2006; Morgan & Hunt, 1994; Sarkar, Echambadi, Cavusgil, & Aulakh, 2001) which are also key focal constructs in understanding the performance of interorganizational relationships.

In regards to relational factors, trust has emerged as a dominating factor in strategic collaborations (Inkpen, 2002; Mohr & Spekman, 1994). In response to its obvious importance, there have been many calls in the literature to further evaluate the role of trust in inter-organizational relationships. Specifically, there is a need to assess the implications of trust in the relationship between knowledge processes/capabilities (Blomqvist & Levy, 2006; Kale, Singh, & Perlmutter, 2000; Noblet, Simon, & Parent, 2011), innovative performance (Blomqvist & Levy, 2006; Bunduchi, 2013), and overall alliance success (Gulati, 1995).

GAP 3: A better understanding the role relationship factors, namely trust, play in the capability-performance relationship.

C. Aim of Study and Contributions

The internal processes that take place in collaborating firms are often hidden and misunderstood in many strands of research. Despite the upsurge in interest on inter-organizational collaboration we still witness a lack of understanding in regards to the knowledge processes that go on inside the firms engaged in these relationships. The growth in alliance activity, together with the facilitation challenges and likelihood of failure, makes this particular area ripe for exploration. How, we may ask, does a firm's involvement in external collaborations lead to enhanced innovative performance? What are the internal organizational capabilities that facilitate the collaborative processes? Do these internal organizational capabilities have the same impact on both radical and incremental innovation generation? On general alliance performance? And, what role, if any, do relational factors have in the outcomes of these collaborations? This thesis will aim at addressing these and related questions through three general steps. The first step seeks to clarify the meaning and construct of dynamic capabilities from a knowledge-based view through the lens of three distinct knowledge capabilities. In the second step the relationship between

these knowledge-based dynamic capabilities and alliance performance is modeled and investigated. Finally, the role of relational trust in the capability-performance relationship is examined.

The present study aims to address the aforementioned gaps in the literature by drawing on transactive memory theory, dynamic capabilities theory and the knowledge-based view of the firm to argue that the effects of interorganizational collaborations on new product innovativeness vary and are contingent upon a firm's knowledge capabilities and partner relationship environment. The core theme addressed in this research is the role of internal knowledge capabilities in the context of the collaborative process. I will argue that knowledge capabilities are what link an aspiration to collaborate with the ability to create value from these relationships. While the study of these capabilities is a relatively popular research area, there are three areas commonly overlooked in this research stream 1) the application of a range of knowledge-based capabilities 2) the investigation into higher-order performance outcomes and 2) the inclusion of relational factors. By focusing attention on a comprehensive set of knowledge capabilities in addition to exploring the importance of relational qualities, findings will contribute to the literature by offering a more comprehensive look at capability based interorganizational collaborations.

Hence, using a capability-performance framework this study focuses on strategic alliances and investigates (1) the outcomes of innovative performance and alliance satisfaction in collaborative relationships (2) how knowledge capabilities serve as a means to produce these performance outcomes, and (3) the mediator role of relational trust between the knowledge capabilities and performance outcomes. A focal contribution of this dissertation is to offer new insight into capability based inter-organizational collaboration by linking the independent yet complementary perspectives of the knowledge-based view of the firm (KBV) and dynamic capabilities theory (DC) together with transactive memory theory (TM).

D. Overview of the Dissertation

This chapter presented the problem, purpose and significance of this research project and identified the major questions driving this study. Major gaps in the literature were identified, in addition to an explanation as to how this dissertation addresses those gaps through building on prior knowledge. Chapter II presents a critical review of the literature that includes an overview of the three theories guiding this research. In this chapter the conceptual framework and associated hypotheses are introduced, along with an overview of the major constructs relevant to the framework. Chapter III contains the research methodology, including the research design, sampling, data collection, and analysis methods for this study. Chapter IV presents a discussion of the data collected in this study and an analysis of each of the hypotheses provided in Chapter II. The final chapter, Chapter V, presents an overview of findings and implications based on the data analysis from the previous chapter. This chapter also presents limitations, contributions for research and practice, and future research directions.

II. THEORY DEVELOPMENT AND CONCEPTUAL FRAMEWORK

A. Introduction

Motives for entering an alliance are often numerous and varied,[1] but at a high level relationships between companies are generally established in order to bridge gaps and enhance some aspect of performance. It is often assumed that a learning motive drives much of alliance strategy and formation (Hamel, 1991; Khanna, Gulati, & Nohria, 1998; Larsson, Bengtsson, Henriksson, & Sparks, 1998; Salk & Simonin, 2003). This desire for learning encourages a firm to create more permeable boundaries between it and its external environment to encourage the flow of knowledge. Interfirm collaboration provides opportunity for partners to gain access to knowledge and skills that are either unavailable or too costly to develop internally (Hamel, 1991; Xu, Wu, & Cavusgil, 2013). In recent years alliances have become one of (if not the) most widely used organizational forms for absorbing and creating new knowledge (Cohen & Levinthal, 1990; Inkpen, 1998b; Larsson et al., 1998).

In this dissertation I will argue that while porous boundaries provide the *opportunity* for a firm to access the external knowledge flowing between organizations, they do not provide the *ability* to successfully act on that knowledge. It has been suggested that firm capabilities, through enabling and leveraging a firm's resources, may be what enable some firms to perform better than others (e.g. Grant, 1996b; Krasnikov & Jayachandran, 2008; Teece et al., 1997). Virtually all companies today can be viewed as knowledge organizations, in that knowledge is a primary (or sole) resource and source of differentiation (Dawson, 2000; Grant, 1996a). In response to this view, fundamental organizational processes are increasingly knowledge-based as a greater emphasis is placed on managing intangible

[1] For a review of alliance formation motives, please see Glaister, K. W., & Buckley, P. J. (1996). Strategic Motives for International Alliance Formation. Journal of Management Studies, 33(3), 301-332.

knowledge assets. An organization's knowledge capabilities, or its ability to manage and create value through knowledge stock and processes, may ultimately determine survival and competitive advantage (Dawson, 2000; Teece, 2000). Thus, in an environment increasingly characterized by knowledge-based competition, there exists a natural desire to better understand the management of knowledge and knowledge processes on which an organizations success depends.

Optimal innovative outcomes require the integration of both internal and external knowledge (Grant, 1996a; Kogut & Zander, 1992; Xu et al., 2013). Even the most capable companies are finding it necessary to use interorganizational knowledge transactions to build internal knowledge bases, fill internal knowledge gaps, and create capacity in innovation (Argote et al., 2003; Chesbrough, 2003; Gulati, 1999; Laursen & Salter, 2006; Moorman & Miner, 1997). To leverage external knowledge sources and supplement internal innovative activities, firms are increasingly pursuing the development new products and services through the use of alliances (Amaldoss & Rapoport, 2005; Carlson et al., 2011; Deeds & Rothaermel, 2003; Emden et al., 2006; Faems et al., 2005; Rindfleisch & Moorman, 2001; Sivadas & Dwyer, 2000), despite the added difficulties managing innovation within an alliance may bring (Gerwin & Ferris, 2004). In an era of knowledge-based competitiveness, these alliances have become a critical source of innovative performance and success.

However, the combination of high failure rates in both new products and alliances suggests interorganizational innovation to be especially prone to failure (De Man & Duysters, 2009). A conflict between innovation and alliances can exist, in that aspects often deemed necessary for success in new product development are difficult to achieve in a collaborative environment (Bidault & Cummings, 1994; Sivadas & Dwyer, 2000). As innovation is increasingly conducted across firm boundaries, the utilization of knowledge management processes and the strategic management of the flow of knowledge between partners becomes central to innovative success (Ahuja, 2000; Argote et al., 2003; Jiang & Li, 2009). The

link between knowledge management and innovation is both widely discussed and accepted (e.g. Andreeva & Kianto, 2011; Cohen & Levinthal, 1990; Darroch, 2005; Goh, 2005). Thus, while the capabilities that lie at the center of this research exist in all firms and play a role in all alliances, this dissertation focuses more narrowly on innovative outcomes. This leads to the overarching question for this research: "Why are only some alliances successful in creating innovations?" To begin to address this question, I begin with the concept of internal knowledge-based capabilities.

1. Knowledge Capabilities

According to Alavi and Leidner (2001), knowledge may be viewed as: a state of mind, an object, a process, a condition of having access to information, or a capability. As an **object**, knowledge is a thing to be stored (such as in repositories or organizational memories) and manipulated. Viewing knowledge as a **condition**, the focus is placed on access to knowledge, whereas the **state of mind** perspective relates knowledge to a "state of fact or knowing" and emphasizes and understanding through experience. The **process** perspective focuses on simultaneously knowing and acting, in contrast to the **capability** view which links knowledge to the potential for influencing future action and performance. These perspectives are important to understand because they influence the way knowledge is managed within the firm.

For this research, knowledge is viewed as a capability, which deems the management of knowledge to be centered on building core competencies, understanding the strategic advantage of know-how, and creating intellectual capital (Alavi & Leidner, 2001). The view of knowledge as a capability suggests it is not the specific action that is most important, but rather the ability to interpret and use information to ultimately influence outcomes. Thus, viewing knowledge as a capability addresses the relationships between knowledge, knowledge management and performance. According to Dawson (2000), "knowledge capabilities can be understood as the capabilities of organizations to perform

effectively the knowledge processes on which their success depends." Since the first attempts to conceptualize a firm's knowledge processes, the number in the literature has grown to more than a few hundred (Kraaijenbrink, 2012). Some popular conceptualizations are shown in TABLE I.

TABLE I: HIGHLIGHT OF KNOWELDGE PROCESSES FROM THE LITERATURE

Authors	Processes
Cohen and Levinthal (1990)	recognize the value, assimilate, apply
Huber (1991)	knowledge acquisition, information distribution, information interpretation, organizational memory
Nonaka and Takeuchi (1995)	acquire, create, accumulate, exploit
Spender (1996)	create, transfer, use
Alavi and Leidner (2001)	creation, storage, retrieval, transfer, application
Gold, Malhotra, and Segars (2001)	acquisition, conversion, application, protection
Zahara and George (2002)	acquisition, assimilation, transformation, exploitation
Jantunen (2005)	acquisition, dissemination, utilization
Sandhawalia and Dalcher (2011)	creation, conversion, transfer, application
Zheng, Zhang, Wu and Du (2011)	acquisition, generation, combination

Despite the numerous ways these knowledge processes have been described, scholars agree the definitions between them are quite similar and the difference lies primarily in terms of the numbering and labeling of the processes (Alavi, Kayworth, & Leidner, 2006; Andreeva & Kianto, 2011; Meier, 2011). The lack of a universal categorization does not discredit the importance of these knowledge processes. The ability to manage internal and external knowledge processes is a crucial determinant of both alliance and organizational performance (Duysters, Kok, & Vaandrager, 1999; Hurmelinna-Laukkanen, Olander, Blomqvist, & Panfilii, 2012; Lane & Lubatkin, 1998; Smith, Mills, & Dion, 2010). Because of this, scholars agree that firm knowledge capabilities, especially as they pertain to

collaborative arrangements, are a crucial research area (e.g. George et al., 2001; Inkpen, 2002; Meier, 2011).

In this chapter, a model of collaboration is developed by integrating the knowledge-based view (KBV) of the firm, transactive memory theory (TM) and dynamic capabilities theory (DC) with literature on innovation and inter-organizational collaboration. Building from these theories, innovation is viewed as a knowledge-intensive process fueled by internal knowledge management capabilities. First, an overview of the conceptual foundations of each of the theories is provided with particular emphasis on, and discussion of, knowledge management capabilities. Following this overview, this dissertation builds from research that applies KBV, TM and DC to develop a model and associated hypotheses of collaboration based on knowledge management capabilities and relationship characteristics, and as evidenced by innovation outcomes.

B. Theoretical Lens

1. Knowledge Based View

The Knowledge Based View (KBV) is most often noted as an outgrowth of the resource-based and organizational learning streams of research. The key differentiator of this particular view is a shift away from the concept of organizational knowledge and a focus on the firm itself and more towards the mechanisms through which the management of knowledge is achieved (Grant, 2002). The KBV revolves around the leveraging of capabilities (McEvily et al., 2004) and attributes heterogeneous firm performance to differences in knowledge stock and the ability to access and integrate specialized knowledge (Bierly III & Chakrabarti, 1996; Grant, 1996b). Specifically, emphasis is placed on the need for a firm to develop organizational capabilities to effectively manage knowledge within and across firm boundaries in order to achieve sustained competitive advantage and superior performance (Eisenhardt & Santos, 2002; Grant, 1996a). Unlike bureaucratic and information-processing approaches of

organization, the knowledge-based approach stresses delayering, empowerment, and the utilization of team-based structures and interfirm alliances. Thus, the KBV is often applied in alliance research where collaborations between firms are frequently used to facilitate the absorption and creation of knowledge.

As the KBV continues to spark interest, scholars are increasingly focusing the management of knowledge (Akgun, Byrne, Keskin, Lynn, & Imamoglu, 2005; Argote et al., 2003). Researchers and managers have long emphasized the challenges in capturing, developing, sharing and effectively using knowledge (Murray & Chao, 2005). As the range and diversity of knowledge increases, managing knowledge within a firm becomes increasingly complex. Effective knowledge management is now deemed to be a necessary organizational capability (Darroch, 2005; Grant, 1996b). The focus on knowledge management has also naturally spurred an interest in tools that can facilitate knowledge identification, sharing, processing, and capturing. In the literature, technology is commonly assumed to be effective in the facilitation of these various knowledge processes (e.g. Pan & Leidner, 2003; Von Krogh et al., 2000). However, this literature generally follows an information processing view in which knowledge flows fluidly between people and networks (Swan, Newell, Scarbrough, & Hislop, 1999). For example, the majority of new product development studies focus on hard-data memory (such as records, databases and files) (Akgun, Byrne, Keskin, & Lynn, 2006). Although technology and hard-data memory (aka mechanistic memory) are important for effective performance, they are also inadequate. The mechanistic memory, in assuming information and knowledge are synonymous, does not capture the whole picture. In contrast to an information-processing view, organizational theorists have stressed the importance of understanding the role of social relationships and human interactions in knowledge (Kogut & Zander, 1992; Nonaka & Takeuchi, 1995; Swan et al., 1999; Von Krogh et al., 2000). Knowledge management involves much more than an investment in databases; knowledge encompasses beliefs, commitments and actions and is often created spontaneously. This view becomes especially

prevalent within innovation, where the processes are interactive, groups are heterogeneous, knowledge flows across functional and organizational boundaries, and the balance between internal and external knowledge is especially crucial (Lawson, Petersen, Cousins, & Handfield, 2009; Spender, 1996; Xu et al., 2013). It is within this more process-based view embraced by organization theorists that the focus of attention turned to managing knowledge as a capability.

Much of the current literature biased with the information-processing viewpoint treats knowledge as a commodity creating implications in developing the localized, socialized context of knowledge management. The evolution of theoretical perspective towards a more process-based view has addressed some of these shortcomings in shifting the focus from knowledge as a commodity to knowledge-related capabilities. However, limitations in current research still exist. The focus remains internal and static, and, according to Nielsen (2002) "considers firms as atomistic actors engaging in strategic actions in an asocial context". Recent literature has stressed the importance of addressing sociological variables, human interrelations and the social network within knowledge capability research (e.g. Akgun et al., 2006; Borgatti & Foster, 2003; Volberda, Foss, & Lyles, 2010; Zahra & George, 2002). Within the stream of literature that has heeded this request, one construct is becoming increasingly relevant in understanding knowledge processes; transactive memory systems (TMS). In any collaborative project there will come a time in which expertise is needed that does not exist on the project team. Transactive memory is the mechanism required to localize the knowledge needed; either within the organization, within the alliance organizations, or beyond the alliance (Grunwald & Kieser, 2007).

2. Transactive Memory

As Henry Chesbrough simply explained, "Not all the smart people work for us. We need to work with smart people inside and outside our company" (Chesbrough, 2003). Inter-organizational alliances, purposefully constructed to leverage the specialized expertise of individuals, can be seen as an acknowledgement of this fact. Firms desire to access the network of knowledge that exists beyond the boundaries of the firm. Value is ultimately provided to the organization through intense human interaction in which members fully utilize their unique expertise, integrate the differentiated expertise of other members, and tap relationships for various informational needs (Akgun et al., 2006; Lewis, 2003; Nonaka & Takeuchi, 1995). Interactive social networking mechanisms are necessary to facilitate the knowledge processes that take place among and between organizations and their members (Todorova & Durisin, 2007; Zahra & George, 2002). In order to manage a knowledge-intensive activity it is necessary to merge a range of expertise, consider multiple perspectives, and use the knowledge network (Akgun et al., 2005).

Knowledge capabilities are necessary for a firm to obtain value and innovation from external knowledge, but they do not act alone in value creation. Ultimately it is through knowledge connections and communicative processes that knowledge is shared, transformed, retrieved and developed (Huang, Barbour, Su, & Contractor, 2013; Inkpen, 2000). Thus, a firm must utilize networking and human capabilities in conjunction with knowledge capabilities to achieve maximum performance outcomes (Caloghirou et al., 2004). Scholars have long advocated for examining the influence of social networks on information exchange and knowledge sharing (Huang et al., 2013). Transactive memory theory (TM) is especially relevant among the theoretical constructs that attempt to explain the coordination and use of knowledge or skills within and amongst groups or teams. It is a theory of expertise location and coordination that specifies the development of directories of meta-memory that include the knowledge

of "who knows what" (Lewis, 2003; Nevo, Benbasat, & Wand, 2012). Originally conceptualized by Wegner (1985) to explain the division of cognitive labor that develops in intimate couples, he later extended the concept to group settings in which there exists a system of transactive memory, i.e. transactive memory system (TMS) (Wegner, 1987). Today, the theory is most commonly applied towards group-level cognition and provides a framework to describe how a group can cooperatively learn, store, use, and coordinate knowledge to increase effectiveness (Brandon & Hollingshead, 2004).

While transactive memory foundations are within dyad and groups, research indicates transactive memory is driven by interpersonal communication and interdependence (Brandon & Hollingshead, 2004; Hollingshead & Brandon, 2003) suggesting TMS processes exist throughout an organization and not just within groups (Jackson & Klobas, 2008; Peltokorpi, 2012). On an organizational level, transactive memory is deemed to facilitate the search for knowledge resources, the integration of knowledge within and across the organization, and the application of knowledge to the problem(s) at hand (Hollingshead, Gupta, Yoon, & Brandon, 2011). In these conceptualizations a TMS is often likened to a cognitive network (often the analogy of a computer network is used) in which expertise is distributed and people need to know who knows what to use this expertise efficiently (Palazzolo, Serb, She, Su, & Contractor, 2006; Peltokorpi, 2012; Yuan, Fulk, & Monge, 2007). Knowing what other people know enables information to be retrieved beyond personal, group and organizational boundaries. TM theory has been deemed to be beneficial in a variety of areas, including: studies on cross-functional integration, knowledge integration in product development teams, the sharing and dissemination of tacit information of different knowledge domains, and the effective use of human resources in teams (Akgun et al., 2006).

Much of transactive memory research seems to assume (or imply) that diverse knowledge is all held within one organization, and the efficiency comes in that individuals and groups will route knowledge to "experts" to reduce cognitive load and still provide access to a greater amount of

information collectively. However, in the case of inter-organizational transactive memory, the rules of the interaction are slightly different. The firms do not have a choice or an ability to determine who gets to possess/store which information. The information divide exists between firms and is beyond the control of one organization. However, a firm's competency in transactive memory processes would clearly yield benefit here. While a firm may have less control in the routing and/or storage of information, it seems logical to assume that a firm with a well-developed transactive memory would be more successful in determining knowledge experts and retrieving knowledge from those experts – both within and across the organization. TM theory becomes especially useful when investigating innovation, as the innovative process often requires a knowledge of who has and needs particular information and benefits when members utilize their own knowledge stock in addition to integrating the differentiated expertise of others (Akgun et al., 2005; Lewis, 2003).

3. Dynamic Capabilities

The literature has frequently relied on internal capabilities to explain firm performance differences, yet this static, resource-based explanation has been met with some doubt. Internal capabilities may explain differential firm performance – but do they yield a sustainable competitive advantage? The key to competitive advantage appears to come from the ability to *reconfigure* existing capabilities and *generate* new capabilities when the applicability of existing ones is eroded (Jantunen, 2005). This notion brings the dynamic capability (DC) view of the firm (Teece & Pisano, 1994) to the forefront. DC originated in the strategy field, but has been adopted by a variety of disciplines, including marketing, human resources, information technology and new product development. It is an outgrowth of both the resource-based view (RBV) and the knowledge-based view of the firm (KBV) (Teece et al., 1997). Teece, Pisano & Shuen (1997) define dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments."

Like the KBV, DC considers the firm to be a knowledge processing and utilizing entity (Jantunen, 2005; Teece et al., 1997) and stresses the coordination of knowledge processes in addition to the configuration and alignment of those processes based on firm strategy (Zollo & Winter, 2002). However, it explains inter-firm performance differences through dissimilar abilities to exploit and build capabilities. Addressing the static nature of the resource-based view, DC stresses the evolutionary nature of firm resources and capabilities (Wang & Ahmed, 2007). The DC framework suggests the best use of resources and knowledge is through the continuous adaption of internal and external competencies in order seize opportunities, and thus focuses on the acquisition and development of capabilities. While a firm's performance depends on its ability to apply its capabilities in order to create value, it must also be able to reconfigure and realign those processes in order to align with a continually changing environment. Knowledge processes, in particular, are continually evolving. For a firm to maintain its competitiveness, the capabilities used to perform these processes must be also be highly dynamic (Dawson, 2000).

C. Conceptual Framework

This research examines the capability-performance relationship from a knowledge-based view, in the context of interorganizational collaborations. I posit a theoretical model where alliance performance, both at the individual and portfolio level, is seen as the end product of three knowledge-based capabilities. Eight hypothesis on the interconnections of the knowledge capabilities, relational factors, and performance are proposed and empirically tested. At a high level, this research suggests a firms internal knowledge capabilities unite the aspiration to collaborate with desired performance outcomes, and that the relationship between the capabilities and alliance performance is mediated the relational factors (see APPENDIX A for the full research model). Drawing from TM, DC and KBV theories, I argue that the effects of interorganizational collaborations on alliance performance and new

product innovativeness vary and are contingent upon a firm's knowledge capabilities and partner relationship environment. To follow, each of the framework constructs are discussed in more detail.

1. Absorptive Capacity

With valuable, relevant knowledge often located outside firms' boundaries, the ability to manage the flow of both internal and external knowledge is increasingly becoming a critical capability. In their seminal contributions, Cohen and Levinthal (1989, 1990) raised the issue of this critical capability to the forefront through the notion of absorptive capacity (ACAP). An outgrowth of the organizational learning and knowledge management fields, absorptive capacity is commonly believed to be a crucial capability in knowledge-based competition (Fosfuri & Tribó, 2008; Volberda et al., 2010; Zahra & George, 2002). The original concept of ACAP described three dimensions: 1) the ability to recognize the value of new external knowledge, 2) the ability to absorb the new knowledge and 3) the ability to apply it to commercial ends (Cohen and Levinthal 1990: 128). Widely accepted as the foundation of knowledge management capability research, the Cohen and Levinthal framework is still accepted and applied today. Defined by Cohen and Levinthal (1990) as the "ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends," Lane, Koka and Pathak (2006) proclaim ACAP to be "one of the most important constructs to emerge in organizational research." The authors also note it is commonly misused, misunderstood and overused to the point of which they suggest the construct has been reified. Despite its limitations, it is a well-recognized and well-researched construct that has been embraced by a variety of fields. Significant empirical work has been done on ACAP and how it relates to innovation, interorganizational learning, intra-organizational knowledge transfer and firm performance (Brettel, Greve, & Flatten, 2011).

The seminal papers by Cohen and Levinthal triggered a great proliferation of research on absorptive capacity. There have been several notable attempts to extend or enhance the original definition

including that of Zahra and George (2002), Lane, Koka and Pathak (2006) and Tordorova and Durisin (2007). Zahra and George (2002) define ACAP as "a dynamic capability pertaining to knowledge creation and utilization that enhances a firm's ability to gain and sustain a competitive advantage." In addition to noting its dynamic nature, the authors also add a fourth component to the original definition, pointing to the importance of a firm's ability to *transform* (or modify) existing knowledge in order to enable knowledge application. The authors distinguish four processes that together constitute absorptive capacity, which they combine into two subsets. Potential absorptive capacity (PACAP), which includes acquisition and assimilation, acts at the interface between a firm and its environment and makes it receptive to external knowledge flows. Realized absorptive capacity (RACAP), which includes transformation and application, works within the organization and ultimately contributes to value creation (Fosfuri & Tribó, 2008). Zahra and George also stressed the complementary nature of PACAP and RACAP (each individually meets a necessary but insufficient condition in value generation) and introduced the notion of social integration mechanisms, suggesting that all four dimensions of absorptive capacity are made up of social interactions. The Zahra and George (2002) extension is one of the most widely supported definitions of absorptive capacity and its underlying dimensions and has been explored and empirically validated by a number of researchers (e.g. Camisón & Forés, 2010; Jansen, Van Den Bosch, F. A., & Volberda, 2005; Jiménez-Barrionuevo, Garcia-Morales, & Molina, 2010). However, while these prior works have validated the Zahra and George (2002) framework, they each also created unique scales for each study, contributing to a lack of accepted measurement for the construct.

Drawing on several works, including that of Zahra and George (2002), Lane et al (2006) suggest absorptive capacity consists of three sequential learning processes: exploratory learning, transformative learning and exploitative learning. Exploratory learning is used to recognize and understand new knowledge. Transformative learning combines new knowledge with existing knowledge, allowing

external knowledge to be assimilated (and linking the exploratory and exploitative learning processes). And finally, exploitative learning is used to apply the acquired external knowledge, creating new knowledge and commercial outputs. (March, 1991).

Tordorova and Durisin (2007) utilize the four dimensions proposed by Zahra and George (2002), but question the sequential nature of the processes. The authors suggest knowledge transformation does not automatically follow knowledge assimilation, and instead exists as an alternative process, defining absorptive capacity as the firm's ability to value, acquire, assimilate or transform, and exploit external knowledge. Within this framework, new knowledge does not need transformation and can be immediately assimilated, if that knowledge fits in with a firm's existing knowledge structures. In the event external knowledge does not fit existing cognitive schema, transformation must take place prior to assimilation. TABLE II. compares these frameworks.

TABLE II: DIMENSIONS OF ABSORPTIVE CAPACITY

Author	**1st dimension**	**2nd dimension**	**3rd dimension**	**4th dimension**
Cohen and Levinthal (1990)	Recognize the value	Assimilate	Apply	
Zahra and George (2002)	Acquire	Assimilate	Transform	Exploit
Lane, Koka and Pathak (2006)	Exploratory Learning	Transformative Learning	Exploitative Learning	
Todorova and Dursin (2007)	Recognize the value	Acquire	Assimilate or Transform	Exploit

For this research the Zahra and George (2002) conceptualization of absorptive capacity as a set of sequential, dynamic organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge is adopted. By stressing the dynamic nature of the capability, the focus is on the continuous reconfiguration of the knowledge capability, putting more emphasis on knowledge processes than on knowledge stocks (Jantunen, 2005). This research also empirically addresses the role of social interaction among organizational members and between organizations as it relates to organizational knowledge processes, through a new construct which I term "knowledge networking capability."

2. Knowledge Network Capability

Research into a firm's knowledge capabilities often assumes a firm's knowledge processes occur internally to the firm and that the role of these processes is to facilitate some sort of knowledge flow or movement. However, a firm's ability to retain knowledge internally is limited (Marsh & Stock, 2006) and firms often utilize external collaborations as an avenue to capture and store knowledge. In these situations, knowledge may be retained in the memory of others. Instead of a transfer or flow of knowledge, the relevant knowledge is labeled and the location is noted. What an organization then possesses are meta-memories, or memories about the memories of others (Nevo and Wand 2005).

The management of an external knowledge base requires a ***knowledge network capability*** (KNC) to successfully maintain the knowledge stored within interorganizational relationships. Through this capability, alliance members use one another as external memories focusing who-knows-what and who-knows-who-knows-what. When a problem or knowledge need arises, individuals/teams must know where to start the search process. Knowledge is then activated and exchanged at the point of time needed. Using a KNC, a firm would consider external connections more like a strategic portfolio of collaborations in which knowledge and technology synergies can be manipulated (Smart, Bessant, & Gupta, 2007).

These external connections comprise a firm's network: a strategic resource of the firm which is difficult for a competitor to copy. This inimitable resource is a means to access inimitable resources and capabilities (Gulati, Nohria, & Zaheer, 2000; Sluyts, Matthyssens, Martens, & Streukens, 2011)

Largely a theoretical concept, similar notions have been discussed in the literature, most commonly the concept of transactive memory in small group research. In the concept of transactive memory, individuals play the role of external memory for others and a directory of who-knows-what or who-knows-who-knows-what is created to indicate where to go for information (Wegner, Erber, & Raymond, 1991). This directory is not limited to small groups and can be applied to identify experts with varying connections to the firm, from members of a development project (Akgun et al., 2005) to members within and outside of an alliance (Grunwald & Kieser, 2007). In regards to collaborative innovation, the benefits of transactive memory include: facilitating the sharing and dissemination of tacit knowledge, access to an expanded pool of expertise, reduction of individual cognitive loads, the allocation of knowledge resources and increased efficiency of effort (Akgun et al., 2005).

A transactive memory system (TMS) consists of two components: a structural component and a process component (Wegner, Giuliano, & Hertel, 1985). As a structure, a TMS is defined as an organized store of knowledge most commonly identified by three behavioral indicators: specialization, credibility and coordination (Lewis, 2003). Specialization refers to the differentiated structure of team/member knowledge; credibility refers to the members' beliefs about the accuracy and reliability of other members' knowledge, and coordination refers to the degree of efficiency and orchestration in knowledge processing (Lewis, 2003, 2004). TMS processes are the mechanisms which coordinate learning and knowledge retrieval (Lewis & Herndon, 2011) and include directory updating, information allocation and retrieval coordination (using Wegner's (1995) computer network analogy). Directory updating, or expertise recognition, includes the processes by with team members learn about each other's areas of

expertise and create a meta-memory directory of "who knows what". Through information allocation, the directory of expertise is used to communicate (or forward) new information to the individual who possesses that relevant area of expertise. This creates a differentiated memory storage system and allows for the preservation of cognitive capacity as individuals are not required to store knowledge outside their own expertise (Palazzolo, 2005). Through retrieval coordination, team members again use their expertise directory to request information known to be within a teammate's areas of expertise.

For teams formed on a short-term basis, such as an alliance team or new product development team, the behavioral element of TMS may be less relevant. For example, team members with limited experience likely would find it difficult to gauge the credibility of one another. Additionally, research has suggested it is errors within the TMS process (versus issues within the structure) may be what negatively impacts performance (Lewis, Belliveau, Herndon, & Keller, 2007). Empirically, TM theory has been primarily applied in terms of a knowledge structure, underscoring the importance of the transactive processes (Lewis & Herndon, 2011). Due to the fact it is both overlooked, and relevant to performance, the process view of TMS is utilized in this study. While the transactive memory process is often neglected, there are a few notable exceptions. For example, using a process-based perspective, Yoo and Kanawattanachai (2001) found transactive memory to have a positive relationship with a team's collective mind and performance. Akgun, Byrne, Keskin and Lynn (2006) found a positive relationship between transactive memory, speed-to-market and a new product performance, and Dayan & Elbanna (2011) found transactive memory to play an essential role in team intuition, which correspondingly impacted new product process and product performance (Akgun et al., 2006; Dayan & Elbanna, 2011; Yoo & Kanawattanachai, 2001).

3. Performance Outcomes

Capabilities have long been attributed to the basis for differential firm performance, however, whether that impact is direct or sustainable is debatable. To answer a specific need addressed in the literature, this study specifically addresses the higher-order performance outcomes of innovation and alliance effectiveness (Inkpen, 2002; McEvily et al., 2004). In addition to a focus on innovation and alliance effectiveness, we also address these alliance-based performance outcomes at both the individual alliance and portfolio level. As this research aims to explain sustainable differences in alliance performance among firms, both the levels of analysis are necessary. Alliance research is inherently multilevel (Nielsen, 2010). Yet, although few question the multilevel nature, existing research primarily studies alliances as a single level of analysis (either portfolio or alliance). Numerous researchers have stressed the importance of a firm's entire collection of alliances as a unit of analysis (e.g. Faems, Janssens, & Neyens, 2012; Gulati, 1998; Khanna et al., 1998; Wassmer, 2010).

As we address the heterogeneity in alliance performance that lies across firms, we investigate capabilities as macro-level constructs which (usually) lie at the level of the firm (Foss, Husted, & Michailova, 2010; Teece, 2007). Thus, our focal unit is that of the firm, and construct measurement and data collection must be conducted at the alliance portfolio level in order to ensure conformity with the theory and preserve heterogeneity of the data (Nielsen, 2010). Research has clearly indicated that these firm-level capabilities are related to firm-level outcomes (Dosi, Nelson, & Winter, 2000; Eisenhardt & Martin, 2000; Teece, 2007; Winter, 2003). Specifically, the relationship between firm-level knowledge capabilities and firm-level (organizational) performance has been generally confirmed (Gold, Malhotra, & Segars, 2001; Liu, Chen, & Tsai, 2005; Mills & Smith, 2011). It has been suggested that micro-level performance mediates macro-level performance (Abell, Felin, & Foss, 2008; Foss et al., 2010), thus we also conduct a more micro-level look at knowledge capability research. It is important to note that we

are not recommending a standardization of capabilities across a firm's alliance portfolio. Different alliances have different objectives and thus may require different knowledge capability strategies. What we are suggesting is merely that firm-level knowledge capabilities impact alliances both collectively and individually.

a. Alliance Success

As both theory and practice have noted that some firms are clearly more successful with alliances than others, it is important to capture a general measure of alliance success. We have witnessed the growing importance and prevalence of alliances in addition to the generally high failure rates. Greater alliance success may provide a firm the opportunity to enjoy a competitive advantage (Dyer & Singh, 1998; Gulati, 1999; Kale & Singh, 2007). However, there are as many possible benefits from forming alliances as there are motives for entering into the alliance in the first place (Day, 1994; J. S. Whipple & Gentry, 2000). At a high level it can be assumed that these inter-organizational relationships are formed in order to enhance some aspect of performance. Because motives vary across alliances, it is likely that achievement across alliances will also vary (Whipple & Gentry, 2000). Additionally, common motives will produce common expectations, yet it is the achievement of these expectations that will vary. Thus, meeting performance expectations is a critical aspect of alliance success.

b. Innovation

Research in the area of interorganizational collaboration frequently includes a focus on learning. While there is an overlap, we argue against the automatic pairing of the concepts of learning and collaboration. In the study of knowledge-related capabilities, learning outcomes, such as knowledge transfer and knowledge acquisition, are frequently used as measures of performance. Learning outcomes are not always desired, and while they often occur regardless of the strategy, they may not be the right measure of success. The literature is replete with examples of interorganizational

relationships that deemed the learning or acquisition of knowledge to be of minor importance (e.g. Grant & Baden-Fuller, 2004; Grunwald & Kieser, 2007; Hamel, 1991; Inkpen, 1998a). Not only is the transfer and internalization of partner knowledge not always a firm goal, but it frequently is not the most efficient method of achieving objectives (Colombo, 2003; Zeng & Hennart, 2002). Learning outcomes are undoubtedly important, however, the conversion of knowledge into new products and services is the basis of superior performance (George et al., 2001; Nonaka & Takeuchi, 1995). Innovation may be a result of alliance learning, but it can also be created through the combination of diverse knowledge bases instead of a transfer, or acquisition of knowledge (Nielsen & Nielsen, 2009). Learning and innovation outcomes are related, *yet distinct*, outcomes of knowledge management processes. Based on previous research, we agree that while inter-firm learning is positively related to innovation, it is not necessarily a prerequisite. Because partner learning is not always desired, can be inefficient, and is not necessary for innovative outcomes, it is not a focus of this research. Interorganizational collaborations have been acknowledged as important drivers of firm innovation (Baum, Calabrese, & Silverman, 2000; Deeds & Rothaermel, 2003; Faems et al., 2005; Rindfleisch & Moorman, 2001; Sivadas & Dwyer, 2000), and we seek to provide empirical evidence to support that notion.

4. Relational Factors

Building on social exchange theory, Morgan and Hunt's (1994) classic article proposes that relational factors, specifically commitment and trust, are key focal constructs in understanding the performance of interorganizational relationships. Specifically, the authors note that relationships and networks characterized by commitment and trust engender cooperation, commitment and reduced uncertainty, which contribute to the overall performance (Morgan & Hunt, 1994). Since that point, literature has increasingly highlighted the importance of relational factors as one of the key building blocks of alliance success. For example, Kale et al (2000) propose the notion of *relational capital*, which

they define as "the level of mutual trust, respect, and friendship that arises out of close interaction at the individual level between alliance partners." Cullen, Johnson and Sakano (2000) stress the importance of the "soft side" of alliance management and what they also term *relationship capital*, or the quality of the relationship between the firms, which includes elements of trust, commitment, norms of reciprocity and cultural sensitivity. Sividas and Dwyer (2000) propose the success of an alliance, and NPD in particular, to be dependent on *cooperative competency*, a variable composed of trust, communication and coordination. Sarkar et al. (2001) also discuss *relationship capital* which they state includes mutual trust, reciprocal commitment and information exchange. The authors note that relationship capital elicits cooperative behavior which is critical in the transformation of potential to realized value in alliance performance. Carlson et al. (2011) suggest relational factors, which include communication, trust, commitment, reciprocity, perceived risk, and conflict reduction, enable firm-level capabilities to be utilized in a manner that benefits the alliance partnership. The terms and definitions vary, but it is clear that relationship factors matter. Additionally, while there are a variety of components utilized in these frameworks, trust is overwhelmingly one of the most studied relational alliance attributes.

Trust is reported to: act as a substitute for formal and/or hierarchical governance (Dyer & Singh, 1998; Gulati, 1995; Gulati & Nickerson, 2008; Sarkar et al., 2001), deter opportunistic behavior (Kale et al., 2000; Kale & Singh, 2009), facilitate social interaction and sharing of knowledge (Inkpen, 1997; Krishnan, Martin, & Noorderhaven, 2006; Nielsen & Nielsen, 2009), increase transparency, and reduce uncertainty (Nielsen & Nielsen, 2009), transaction costs (Gulati, 1995; Nielsen & Nielsen, 2009; Sarkar et al., 2001; Zaheer, McEvily, & Perrone, 1998), and monitoring costs (Cullen, Johnson, & Sakano, 2000; Krishnan et al., 2006; Sarkar et al., 2001). These benefits of trust likely act as enabling conditions which enhance the value of the exchange and ultimately lead to improved performance (Zaheer et al., 1998).

Additionally, a lack of trust has been linked with a breakdown in alliance processes and ultimate failure of the alliance (Duysters et al., 1999; Inkpen, 1998a).

D. Hypothesis Development

In the following sections, the original research model is outlined and hypotheses are developed based on the relevant literature. A summary of all hypotheses may be found in APPENDIX B. A high level research model (Figure 1) is as follows:

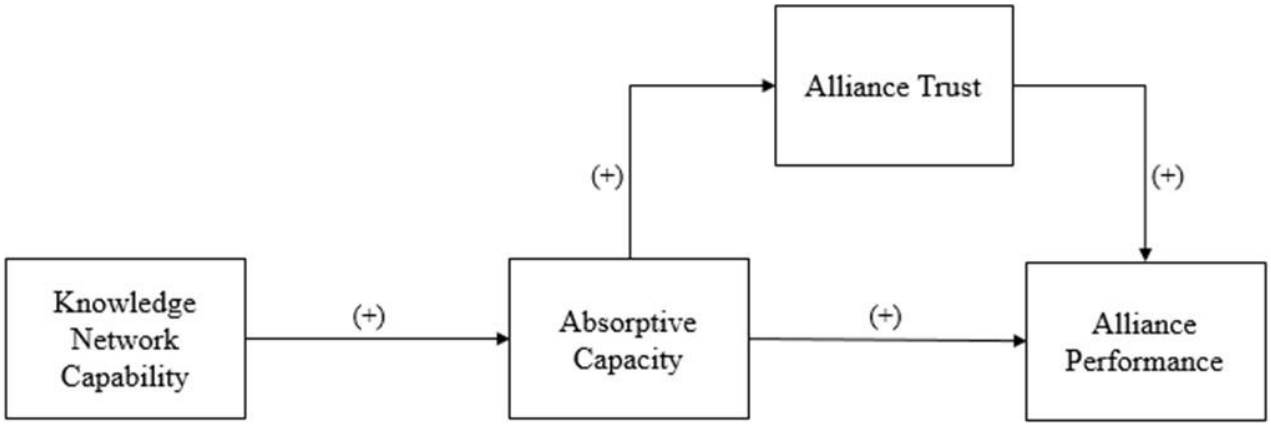


Figure 1. Conceptual model detailing interrelationships.

The model suggests that a firm's knowledge network capability has a positive influence on the firm's absorptive capacity, which ultimately impacts the performance of an alliance. Additionally, alliance trust acts as a mediating variable, implying that the impact of absorptive capacity on the performance of an alliance is realized through the level of trust that exists within the firm's interorganizational relationships.

1. Knowledge Network on Absorptive Capacity

The empirical and theoretical literatures surrounding absorptive capacity and transactive memory, while rarely discussing the other specifically, often highlight aspects of the other. For example, ACAP literature often discusses the importance of interpersonal relationships and communication structures as both sources of, and strengtheners of, absorptive capacity. In transactive memory literature, it is often mentioned that a transactive memory leads to improved knowledge processes. To recap, the knowledge network includes three distinct processes: expertise recognition, information allocation and retrieval coordination. Through this capability a meta-memory of who-knows-what is created, and that directory is then used to communicate and retrieve knowledge. Beginning with their seminal contribution, Cohen and Levinthal (1990) clearly indicate the internal and external communication structure of an organization in addition to the "character and distribution of expertise within the organization" are sources of ACAP. Dyer & Singh (1998) suggest that ACAP is enhanced by knowing who knows what and where critical expertise resides and by designing routines that facilitate information-sharing and increase socio-technical interactions. Matusik and Heeley (2005) note that the ability to identify experts and appropriately route new external knowledge increases ACAP. Van Den Bosch, Van Wijk, and Volberda (2006) define communication structure and the character and distribution of expertise and knowledge to be antecedents of ACAP. Finally, Grunwald and Kieser (2007) specifically demonstrated that firms engage their transactive memories prior to acquiring new knowledge.

A knowledge network capability generates the conditions that facilitate the coordination and leveraging of knowledge (Brandon & Hollingshead, 2004; Chiang, Shih, & Hsu, 2014; Inkpen, 2000; Lewis, 2003; Li & Huang, 2013), and knowledge process capabilities enable a firm to realize the potential benefits of its internal and external networks (Sluyts et al., 2011). Though empirical evidence specifically tying the two concepts directly together is lacking, based on the above discussion we deduce the following:

H1: The knowledge network capability is an antecedent to (a) potential and (b) realized absorptive capacity

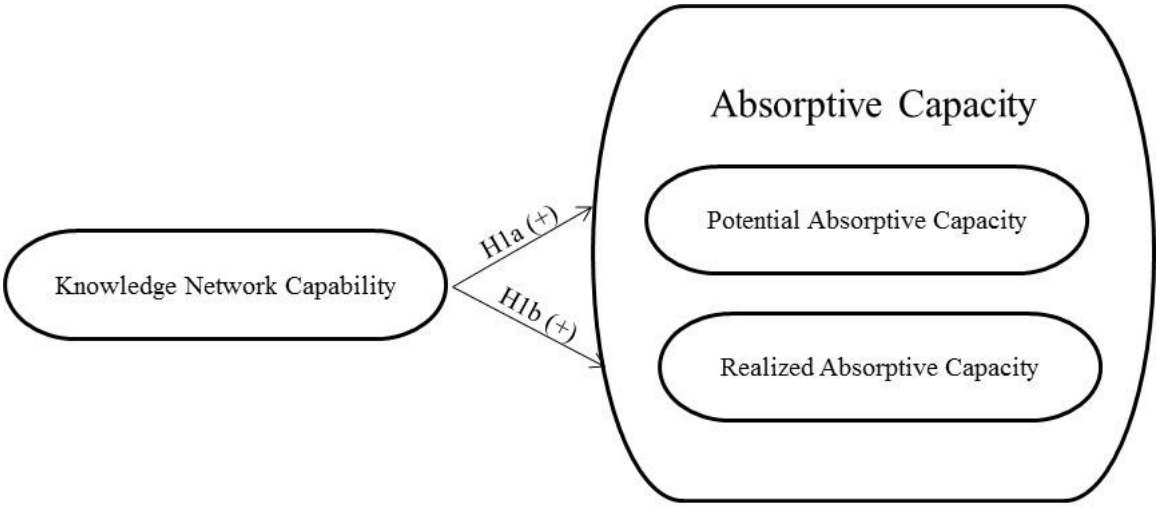


Figure 2. Knowledge network on absorptive capacity

2. Potential and Realized Absorptive Capacity

Zahra and George (2002) propose PACAP and RACAP to be sequential processes that have separate, but complementary roles. The logic behind the concept is that knowledge must actually

be utilized in order to benefit the firm. Without knowledge application (aka RACAP), acquired knowledge is wasted as the potential provided by that new knowledge will never be realized in the form of new processes and products. The sequential nature of potential and realized absorptive capacity is a concept that has been widely supported both theoretically (Murray & Chao, 2005; Srivardhana & Pawlowski, 2007; Yeoh, 2009) and empirically (Cepeda-Carrion, Cegarra-Navarro, & Jimenez-Jimenez, 2012; Ebers & Maurer, 2014; Jansen et al., 2005; Leal-Rodríguez, Ariza-Montes, Roldán, & Leal-Millán, 2014; Montazemi, Pittaway, Qahri Saremi, & Wei, 2012). Thus we hypothesize:

H2: Potential and Realized Absorptive Capacity are sequential processes; PACAP is positively related to RACAP.

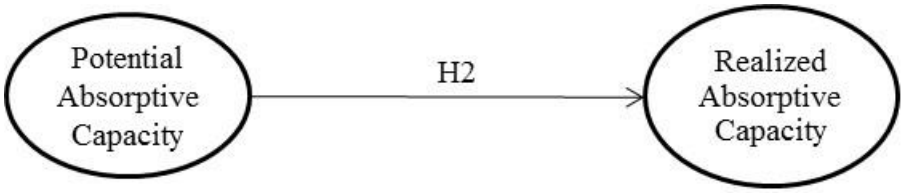


Figure 3. Potential and realized absorptive capacity relationship

3. Absorptive Capacity on Performance

The positive relationship between a firm's knowledge management capabilities and performance has been generally confirmed in a wide span of literature fields (e.g. Cui, Griffith, & Cavusgil, 2005; Gold et al., 2001; Lee & Sukoco, 2007; Liu et al., 2005; Zaim, Tatoglu, & Zaim, 2007). Empirical research has supported the notion that firms with higher levels of ACAP are more effective in innovative performance at both the level of the individual alliance (McKelvie, Wiklund, & Short, 2007; Shu, Wong, & Lee, 2005) and the firm (Chen, Lin, & Chang, 2009; Hurmelinna-Laukkanen et al., 2012; Jantunen, 2005; Tsai, 2001), and have better alliance performance both at the level of the alliance (Lane, Salk, & Lyles, 2001) and the firm (Flatten, Greve, & Brettel, 2011; Hurmelinna-Laukkanen et al., 2012; Tsai, 2001).

In describing the knowledge based view of the firm, Grant (1996) states the primary role of a firm to be the application of knowledge to the development of new products and services. Later research into ACAP verified this notion, when it was deemed that the realized element to absorptive capacity was ultimately responsible for process and product innovation (Zahra & George, 2002). Potential absorptive capacity is a necessary, but insufficient condition for enhancing performance (Zahra & George, 2002), realized absorptive capacity is needed to translate knowledge into performance outcomes. Through RACAP, a firm has the ability to *leverage* acquired and existing competencies. We argue, specifically, that is it a firm's realized absorptive capacity that impacts alliance and innovative performance. Additionally, we note that the effect of a firm's RACAP is not restricted to one alliance but affects all alliances in an alliance portfolio. With a strong RACAP a firm has the ability to integrate new knowledge, enhancing its new product advantage by increasing its potential to generate new products to serve new markets and/ or customer needs. Thus, firms with a strong RACAP are able to develop more innovative products through their alliances on an individual and collective level. As RACAP is ultimately linked to

value creation, it is also expected that a positive relationship between RACAP and alliance performance exists. The ability to successfully apply knowledge at the firm-level is likely to positively influence the performance of an individual alliance as well as all alliances in the firm's portfolio. Thus we have:

H3: Realized absorptive capacity has a positive relationship with alliance performance at the level of the a) firm and b) the individual alliance

H4: Realized absorptive capacity has a positive relationship with incremental innovative performance at the level of the a) firm and b) the individual alliance

H5: Realized absorptive capacity has a positive relationship with radical innovative performance at the level of the a) firm and b) the individual alliance

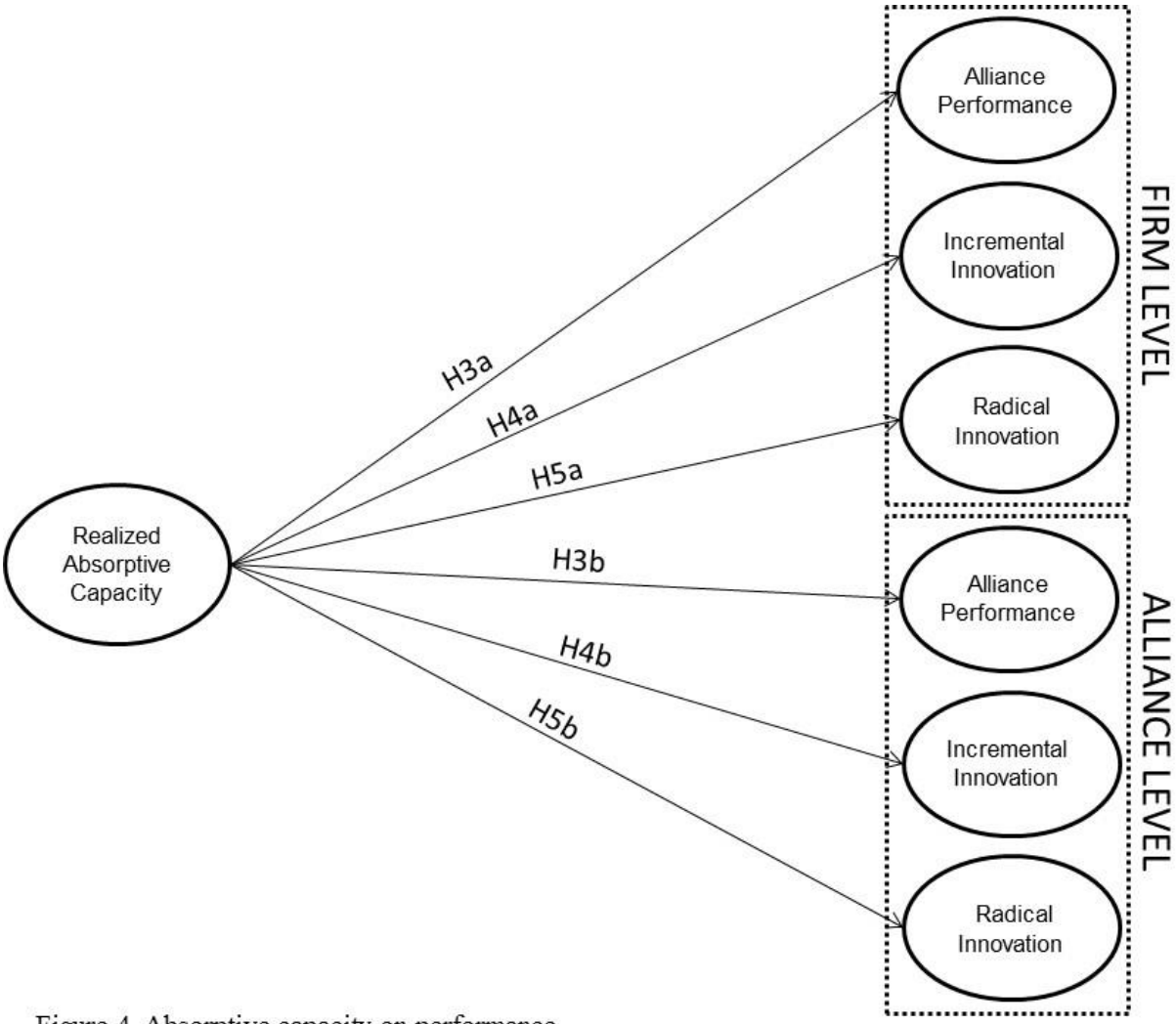


Figure 4. Absorptive capacity on performance

4. Mediator: Alliance Trust

Alliances are characterized by a certain degree of uncertainty, vulnerability and risk of opportunism (Das & Teng, 1996; Rothaermel & Deeds, 2004; Ybarra & Turk, 2009). Alliances with innovative goals tend to exhibit high interdependence and high levels of vulnerability (Krishnan et al.,

2006) due to the inherently uncertain and ambiguous nature of innovation (Lawson & Samson, 2001). Additionally, the processes of knowledge management also creates a certain level of uncertainty and ambiguity (Bstieler, 2006; Simonin, 1999). As uncertainty and ambiguity increase, the role of trust comes to a forefront. Trust reduces uncertainty (Bstieler, 2006; Das & Teng, 1998), mitigates fear of opportunism (Das & Teng, 1998; Sherwood & Covin, 2008; Vos de Wael & Faems, 2011) and has been shown to reduce the actual hazards of opportunistic behavior (Bunduchi, 2013; Gulati, 1995; Kale et al., 2000; Kale & Singh, 2009). Trust acts as a balancing mechanism because it allows a firm to tolerate uncertainty and the risks of opportunistic behaviors.

In the alliance literature, trust has been found to: reduce need for knowledge protection (Vos de Wael & Faems, 2011), substitute for hierarchical contracts and/or serve as an alternative control mechanism (Das & Teng, 1998; Gulati, 1995), reduce the costs of monitoring (Cullen et al., 2000), increase a firms willingness to share and exchange information (Inkpen, 1997; Kale et al., 2000; Kale & Singh, 2009) and increase the general cooperation between partners (Kale & Singh, 2009). Higher levels of trust lead to better performing alliances (Cullen et al., 2000). Research on interorganizational trust has revealed a wide range of positive performance outcomes, including direct, mediating and moderating effects (Zaheer & Harris, 2006). Cullen, Johnson and Sakano (2000) found trust to positively impact financial and nonfinancial goal achievement. Norman (2004) found a positive relationship between trust and alliance performance satisfaction. Bstieler (2006) found that learning relationships with high levels of trust (in contrast to partnerships exhibiting low levels of trust) were significantly more successful on a variety of performance measures, including measures of overall partner satisfaction. Whipple, Lynch and Nyaga (2010) found trust to be the most important determinant of satisfaction with the relationship and performance. These examples are highly corroborated by a variety of empirical works that link trust

to alliance performance (e.g. Silva, Bradley, & Sousa, 2012; Kauser & Shaw, 2004; Krishnan et al., 2006; Lane et al., 2001; Norman, 2004; Ybarra & Turk, 2009).

Researchers have long argued that trust (both intra-organizational and inter-organizational) fosters innovation. Grounded in trust, interorganizational relationships can enable a firm to improve its innovative activities (George et al., 2001). Research into trust in this area often focuses on knowledge acquisition or knowledge transfer as an outcome of collaborative innovation, instead of actual innovative outcomes. In regards to innovative outcomes, Littler, Leverick and Bruce (1995) found trust to be a key success factor in collaborative product development with external partners. Sivadas & Dyer (2000) found "cooperative competency", which includes partner-trust items, to be positively related to NPD success. Wang, Yeung and Zhang (2011) found a measure of general trust in partners to be positively related to innovation performance (for product/service, management, and manufacturing technology).

In general, it is agreed that alliances characterized by trust are more successful than those that are not (Krishnan et al., 2006; Nielsen, 2007; Nielsen & Nielsen, 2009; Wittmann, Hunt, & Arnett, 2009). The existence of trust allows for the most effective and efficient functioning of the alliance relationship (Cullen et al., 2000). Because reliance on a partner can make a firm vulnerable to partner actions, trust is especially valuable in alliances (Das & Teng, 1998). Acting as a facilitator of knowledge exchange, trust has become an essential element for successful cooperation in relationships that involve inter-organizational knowledge flows (Bstieler, 2006). In addition to the direct effects of RACAP on performance (H3, H4, H5), I also suggest indirect effects of RACAP on performance mediated by alliance trust. Thus, it is hypothesized:

H6: Alliance trust partially mediates the relationship between realized absorptive capacity and alliance performance at the level of the a) firm and b) the individual alliance

H7: Alliance trust partially mediates the relationship between realized absorptive capacity and incremental innovative performance at the level of the a) firm and b) the individual alliance

H8: Alliance trust partially mediates the relationship between realized absorptive capacity and radical innovative performance at the level of the a) firm and b) the individual alliance

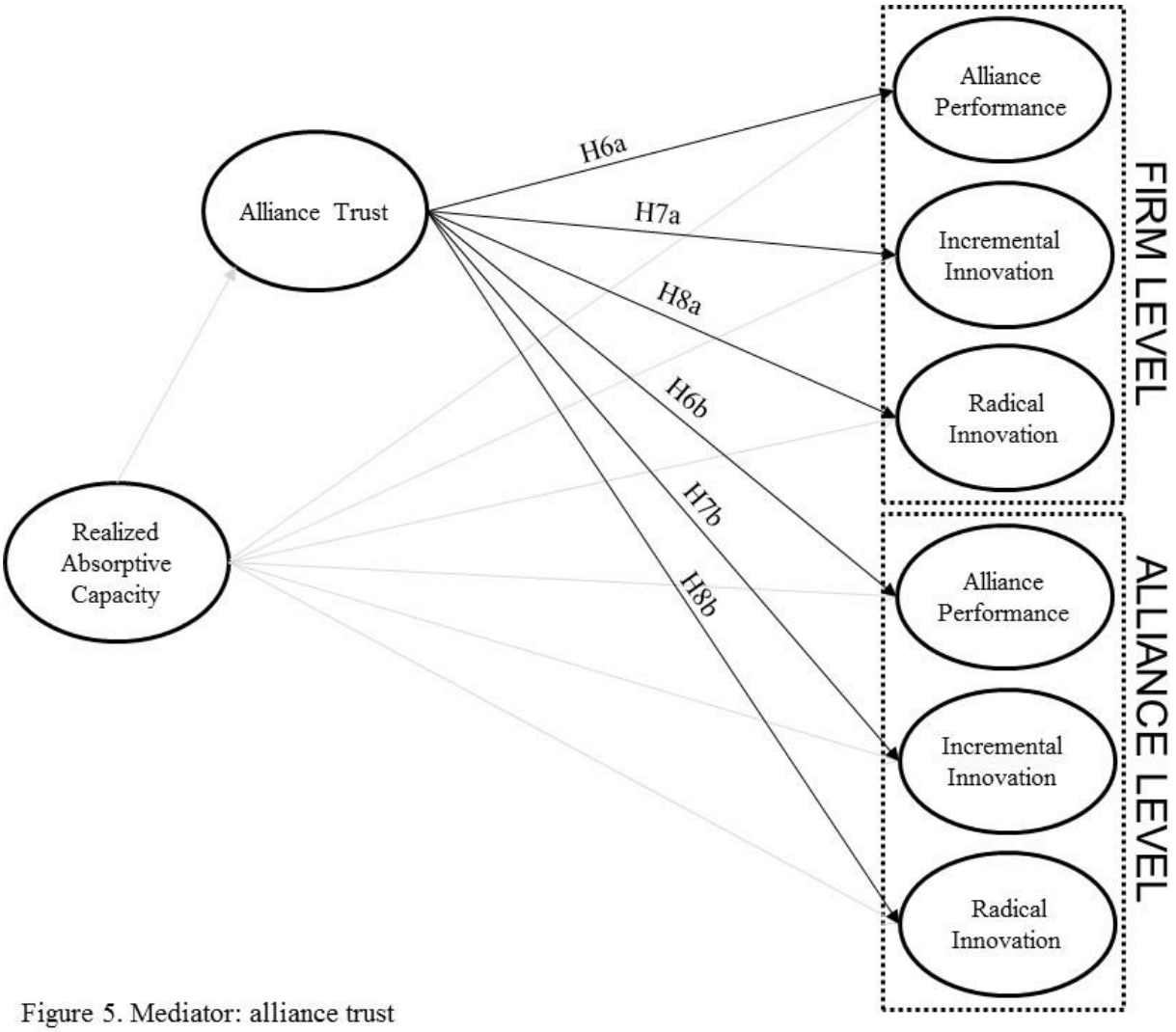


Figure 5. Mediator: alliance trust

E. Conclusion

This conceptual framework integrates three theories; dynamic capabilities theory, transactive memory theory and the knowledge-based view of the firm to examine the role of knowledge-based capabilities in the performance of a firm's interorganizational collaborations. To test the hypotheses, a survey research method was selected to analyze the interconnections between the three major elements of this study: knowledge capabilities, relational factors, and alliance performance. The chapters to follow will provide a detailed discussion of the research methodology and present the results of the survey.

III. RESEARCH METHODOLOGY

A. Study Design

To undertake this empirical study and explore the relationship between knowledge capabilities and relational factors on alliance performance based on relevant theory, a quantitative method of research was selected. With the intention to analyze the relationship between alliances, knowledge management and relational factors, this research is descriptive (versus experimental) in nature. A Likert-type survey was be used to collect the quantitative data. For this particular research, I chose to utilize a web-based method for data collection, following the path of a variety of other researchers in this field (e.g. Silva et al., 2012; Jiang & Li, 2009; Minbaeva, 2007; Nielsen & Nielsen, 2009).

The survey was sponsored by the Association of Strategic Alliance Professionals (ASAP). To secure participation, the survey was introduced as a joint effort between ASAP and the University of Illinois at Chicago. Respondents were offered the opportunity to enter a drawing for an Apple iPad, in addition to summary of results, as an incentive to participate. This research is also supported by an $8,500 award from the University of Illinois Center for Human Resource Management. This research grant was used to cover the cost transcription, the purchase of iPads for response incentives, research-related books and software, and miscellaneous expenses.

The survey was designed to elicit multiple responses based on the data provided by the primary respondent. At the conclusion of the survey, respondents were asked to provide the contact information for a secondary respondent. In the event the primary respondent was deemed to be qualified as a single-respondent, this secondary person would have been utilized to confirm responses and reduce bias. On the other hand, some respondents did not pass screening to qualify as single-respondents. These individuals would have required a secondary response in order to validate their own response.

Unfortunately, in both cases, primary respondents generally declined to offer a secondary respondent. This outcome was anticipated and the survey was built under the assumption this would occur. Thus, responses were not compromised when secondary respondents were not provided. However, data for individuals whose secondary response was necessary was screened out of the final dataset.

The research was conducted in three main phases: an exploratory phase, pilot-testing, and full-sale study:

- *Exploratory Phase*: In-depth interviews with 13 experts in the field of alliance management were conducted to verify assumptions. Guidelines for the interviews can be found in TABLE XXI, APPENDIX C.

- *Pilot Testing:* At the conclusion of the exploratory phase, the questionnaire was modified to reflect new knowledge. The updated survey was tested for three distinct populations: 1) a panel of four academics in the field of marketing, 2) the 13 alliance management experts from the exploratory phase and 3) the 30-member ASAP Board of Directors. These pilot tests were conducted sequentially, allowing for improvements and enhancements of the survey after each population submitted feedback.

- *Full-Scale Study*: The full, web-enabled survey was distributed via email in three separate campaigns during the spring and summer of 2013. The survey can be found in APPENDIX Y.

B. Sampling

In order to accommodate the multiple phases of this research, two unique samples were utilized. A separate population pool was chosen for both the interview and survey phases of the study in order to ensure that no single respondent would be eligible to provide both testing feedback and a final response.

1. Interview Sample

The initial set of respondents (Sample 1) was contacted through Linkedin. Respondents were all members of one of several LinkedIn groups dedicated to strategic alliances, such as the: Alliance Management and Business Development Network, Alliances & Channels Friends or Alliance Best Practice. Individuals were further screened through review of personal Linkedin pages and additional web searches to verify accuracy of provided company and role information. After screening, 133 individuals were selected. Each received a personal direct request to participate in an interview.

2. Survey Sample

The second set of participants (Sample 2) consisted of the membership community of The Association of Strategic Alliance Professionals (ASAP), a professional organization dedicated to the profession and discipline of alliance management. The organizations membership includes C-level executives, directors and manager-level personnel from mid-large size companies spanning multiple countries and in a variety of industries. It boasts of 2,500+ (paid) members in addition to a broader ASAP community, which consists of former members, individuals who have participated in ASAP events and professionals from partner organizations. The primary data was collected using an online survey questionnaire which was distributed to the entire subscription list of ASAP, a total of 6,954 individuals.

a. Respondent Quality Control

The sample provider has two unique populations, those that possess a paid membership to ASAP and those that are not paid members but receive emails due to various affiliations with the organization. While it is safe to assume all individuals on the distribution list have an interest in strategic alliances, their qualifications for this survey are unknown. Responses were gathered from individuals within a variety of functions, using questions within the instrument to filter respondents by

expertise and knowledge. All potential respondents were asked a variety of screening questions in regards to their organization's alliance experience and their own personal role within the organization. Additionally, some respondents were asked additional screening questions to verify knowledge of their organizations alliance strategy. Because respondents were offered an opportunity to enter into an iPad drawing, there was a risk that some participants may rush through the instrument in order to enter the drawing. Data was additionally screened for both missing data and level of engagement and responses that failed to meet requirements were excluded from the analysis.

C. Data Collection

Before data collection began, consent from the OPHRS was granted to conduct the study (see APPENDIX D). During all phases of data collection, the respondents' identities and confidentiality were ensured. Neither company nor individual respondent names are included in any summary information.

1. Phase One: Interviews

As an initial information gathering part of the study, a set of 133 potential respondents (Sample 1) was contacted through LinkedIn with a personal, direct request to participate in an interview related to alliance management. Potential participants were provided a brief explanation of the researcher's purpose of the study, intended outcome of the research process, and a general background on the researcher. After various interactions via Linkedin, email and telephone, 13 individuals agreed to be interviewed and were scheduled for an (approximately) 45-minute long telephone interview.

Interviews were conducted between January 30, 2013 and March 13, 2013. The average length of an interview was 52 minutes with a range of 20 to 84 minutes. There were no direct benefits to the individuals who participated. However, some expressed enjoyment in describing their experiences and insights and expressed satisfaction in contributing to a study that addressed the role of knowledge

capabilities in alliance management. Despite requesting a 45 minute time allocation, many of the interviewees provided additional time and offered to be available for additional questions and/or discussions. Interviews were conducted following a semi-structured, open-ended interview guide (TABLE XXI, APPENDIX C). Alliance professionals were asked about their specific role as it relates to alliance management, the role (and their specific knowledge) of alliance strategy, and the goal and processes of knowledge management (as it pertains to alliances) within their organization. Each interview was recorded and transcribed with the permission of the participant. At the end of the interview phase there was a total of 733.06 minutes (12.217 hours) of transcribed recordings (see TABLE XX, APPENDIX C for details).

2. Phase Two: Pilot Testing

After the interview phases, the survey was pilot-tested in order to validate the instrument. At the conclusion of the exploratory phase, the questionnaire was modified to reflect new knowledge. The survey was then validated through several stages of pilot-testing. First, a panel of four marketing academics provided feedback. Each of these individuals offered input that was incorporated into the final survey. After this initial review was conducted, the thirteen individuals who participated in the interview phase were sent a link to the beta-version of the survey. This beta-version included an area for comments and questions at the end of each section in addition to another section for comments and questions at the conclusion of the survey. This step allowed the assessment of face and content validity of the survey and ensured that alliance executives understood the instructions, questions and response scales of the instrument as intended. All comments and questions were addressed in the final version of the survey. Prior to the full-scale launch of the final survey instrument, it was also reviewed and approved by the ASAP Board of Directors. The 30-member board, all professionals in the field of strategic alliances,

validated the appropriateness of content, tested the quality and flow of the survey instrument, and verified that the survey length fell within a 20-minute range, before offering their final approval.

3. Phase Three: Empirical Data Collection

Email invitations were distributed by the Association of Strategic Alliance Professionals to the entire online community. The message included an introduction to the study and invitation to participate, as well as a link to the online survey. Within the invitation a generic description of a desired respondent was provided, and those recipients who did not fit that description were asked to forward the invitation to the correct person(s) within their own organization. Those that chose to follow the link were provided a more detailed description of the research along with a voluntary consent form. By clicking "accept," potential respondents confirmed virtual informed consent. Individuals were asked several qualifying questions prior to entering the actual survey. Respondents were given an unlimited amount of time to answer the survey questions. Additionally, they had the option to close the survey and return again (to that same point in the survey) should the need arise.

ASAP sent three additional follow-up messages to its population to secure additional respondents. As an incentive to participate in the study, and to increase the response rate, respondents were offered an opportunity to receive results in summary form and notified of the opportunity to enter into a randomized drawing for one (of two) Apple iPads. Entry into that drawing was optional.

D. Instrumentation

As discussed in the design, prior to the full-scale launch the survey underwent a series of reviews and updates at the hands of both academics and practitioners well versed in the field of alliances and knowledge management. The final survey included a total of six sections. The first part established firm-level demographic characteristics, including the location, size, and industry of the participant's company.

Within this section participants were also asked to provide details on their firm's participation in strategic alliances. These data were used for screening purposes, in addition to the basis for statistical analysis. The second part of the survey collected individual level demographic data, as it pertained to the participants experience at the firm in question. Respondents provided information on their role and tenure in the organization, and were asked detailed screening questions as to their current involvement with the firm's alliances. Individuals who indicated executive-level experience and knowledge proceeded to the core survey. Individuals who indicated a managerial or project-level role in the organization's alliances were asked several additional screening questions to capture their knowledge of firm-level alliance strategy. Based on these questions, participants either begun the core survey or were directed to respond to project level alliance activity only. The third part involved a series of questions about a specific alliance. For those with multiple alliance relationships, respondents were directed to consider the alliance their organizational deemed to be the most *strategically important*. Data collected on the specific alliance included demographic information on the partner (e.g. location, industry, contribution to partnership), objectives of the collaboration and the performance of the collaboration. The fourth section asked participants to agree or disagree with a variety of statements in regards to organizational communication and knowledge processes. This section was followed by a section that captured data on an organizations entire portfolio of alliances. The sixth, and final, section collected any referral information for other organizational members that might possess needed information, an option to provide a request for a survey summary or enter into an iPad drawing, and an area for any specific comments or questions directed towards the researcher.

Extant literature was consulted to compile measurement items. Some items are modified to accurately capture the context of this study. Modifications and new measures were developed based on

a review of the literature. Constructs are measured by the average of the responses on a 7-point Likert scale. Complete measure detail can be reviewed in APPENDIX E.

1. Absorptive Capacity

In line with recent research (Jansen et al., 2005; Liao, Welsch, & Stoica, 2003), this study follows the re-conceptualization offered by Zahra and George (2002), who distinguish between potential ACAP (knowledge acquisition and assimilation) and realized ACAP (knowledge transformation and application). Considered as a multilevel construct that can be found at national, industry, inter-organizational, organizational, intra-organizational or individual levels (Cohen & Levinthal, 1990; Lane et al., 2006; Minbaeva, Pedersen, Björkman, Fey, & Park, 2003) our theory suggests capabilities to be firm-level characteristics and thus will be measured as such. The ACAP measure was based on the 21-item, four dimension, scale developed by Jansen et al (2005). While all 21 items were utilized, there were some wording modifications based on two general areas. First, the original scale addresses ACAP from the perspective of the organizational unit whereas this study lies at the level of the firm. Second, during pre-testing some wording proved to be confusing or misleading. Since the construction of the original scale a variety of authors have modified the items to correct for both measurement level and clarity, previous item modifications of these works were used as a basis here (e.g.Ben-Oz & Greve, forthcoming; Fernhaber & Patel, 2012) . TABLE XXII, APPENDIX E has an overview of the twenty-one items by Jansen and the reworded items.

2. Knowledge Network Capability

A total of six items was used to capture the knowledge network capability. Four items are based on Faraj & Sproull's (2000) "expertise coordination" scale. These items are the most common measure used for the process element of transactive memory, and have been used in Akgun et al (2006),

Dayan and Elbanna (2011) and Yoo and Kanawattanachai (2001). Two additional items were created to capture the process of retrieval coordination, an empirically overlooked concept in the literature.

3. Performance

Performance measures include those to capture both innovative performance and overall alliance performance. Due to the multilevel nature of this research, performance is measured for both the individual and portfolio-level of the alliance following the methods of other similar research (e.g. Flatten et al., 2011; Hurmelinna-Laukkanen et al., 2012).

a. Alliance Performance

Alliance performance has proven to be a complicated and challenging area of measurement (Gulati, 1998). The literature is replete with research into "alliance success," yet findings have been difficult to compare and generalize due to the markedly different measures utilized. While an agreement on the general definition and measurement of alliance performance is noticeably lacking from the literature, most interpretations do incorporate some element of goal accomplishment (Ariño, 2003). Despite early criticisms, in recent years there has been increasing consensus that managerial assessments provide an effective and scientifically established manner to assess alliance performance (Ariño, 2003; Geringer & Hebert, 1991; Heimeriks & Duysters, 2007; Kale, Dyer, & Singh, 2002) as many now argue generic performance measures (such as return on assets or stock market reactions) to be inaccurate (e.g.Olk, 2005). A partner's satisfaction with the strategic alliance's overall performance, as applied in this study, evaluates the degree of fulfillment of this partner's goals (common and private, initial and emergent) and is one of the most frequently used measures of performance (Ariño, 2003). The use of managerial assessments is valid both at the individual alliance and portfolio level (Heimeriks, Duysters, & Vanhaverbeke, 2007).

With our primary focus on firm-level measures, I utilized a multi-item scale to measure the performance of the firm's collection of alliances in order to ensure maximum reliability and construct validity. To capture this measure, Hurmelinna-Laukkanen et al's (2012) four-item "alliance success" scale measured the quality of the partner relationship, the achievement of the alliance objectives, the improvement in the competitive position of the firm, and the learning of critical skills from the partner. Similar measures have been used by Kale and Singh (2007), Zollo, Reuer and Singh (2002) and Simonin (1997). Performance for the individual alliance was measured by a single item from Norman (2004) "Our firm is satisfied with the performance of the alliance."

b. Innovativeness

Innovativeness at both the individual alliance and level of the firm were captured using the same measures. Two continuous single-item variables adapted from Ritala and Hurmelinna-Laukkanen (2013) were used to measure the level of incremental and radical innovation. These measures were chosen because they specifically asked the respondent to assess the incremental and/or radical innovation benefits that the firm had accrued as a specific result of their cooperation with the partner(s).

4. Trust

When it comes to interorganizational relationships, trust is developed and reinforced through social interactions (Nielsen & Nielsen, 2009). The impact of these social interactions also leaves interorganizational trust in a state constant transition. Previous research has applied aggregated measures of interpersonal trust as a proxy for interorganizational trust; however, this methodology ignores social interactions and the influence of organizational context and rules that both guide and constrain members (Zaheer et al., 1998). Nielsen (2010) notes that "trust is a multilevel construct that can be theorized, measured, and analyzed at interpersonal, intergroup, organizational, and inter-organizational levels." Measures of trust have also been found to be similar at each one of these levels (Nielsen & Das, 2010;

Zaheer et al., 1998). However, the stability in trust is institutionalized at the organizational level (Zaheer et al., 1998). Because of these factors, what matters at a given point in time is a measure of overall confidence at the level of the organization. Thus, this research follows Lane et al. (2001) and Nielsen & Nielsen (2009) and uses a single, global measure of trust as the indicator of perceived relational quality.

5. Controls

Several variables were included into the model to control characteristics of the firm and the alliance. At the level of the organization, I included organization age, organization size, industry and general partnering experience. At the level of the alliance I included partner-specific experience, the nature of the relationship, and alliance scope.

Organization age, which was measured as the number of years in operation (transformed into categorizations), was included in order to control for any advantages related to length of business operation.

Organization size, which was measured in terms of number of employees, was included in order to control for the diverse empirical findings related to knowledge processes and innovative outcomes. Some research indicates large firms transfer less knowledge (e.g. Norman, 2004). However, numerous researchers have failed to find a relationship between firm size and knowledge management outcomes (e.g. Chen, 2004; Mowery, Oxley, & Silverman, 1996; Muthusamy & White, 2005). Considerable evidence suggests that innovation performance depends on firm size (Chandy & Tellis, 2000; Cohen & Klepper, 1996; Ettlie & Rubenstein, 1987; Fosfuri & Tribó, 2008).

Industry, a set of eight dummy variables categorizing the firm's primary industry was controlled to account for any possible industry effects, which may include (but are not limited to): environmental volatility, the role and relevance of innovation, and variance in performance (Dess, Ireland, & Hitt, 1990).

General partnering experience, was measured in terms of the number of years the firm has been involved in alliances. Firms have been found to better manage their inter-firm relationships as alliance experience accumulates, impacting alliance success (e.g. Anand & Khanna, 2000; Kale et al., 2002).

Partner-specific experience, a dummy variable coded 1 if the respondent had past experience with the specific partner and coded 0 otherwise, was controlled because it may influence alliance efficiency and knowledge management outcomes. Many agree previous collaboration is an important factor, but disagree exactly as to what role it plays. For example, it has been shown to increase dependence and reduce experimentation (Ahuja & Lampert, 2001), facilitate alliance capabilities (Rothaermel & Deeds, 2004), increase efficiency while also decreasing innovative performance (Duysters & Lokshin, 2011; Schoenmakers & Duysters, 2006) and increase knowledge transfer and creation (Muthusamy & White, 2005).

Nature of Relationship, a dummy variable coded 1 if the partner was a Competitor and coded 0 otherwise, was controlled because it has been found to influence the interaction between partners and the outcomes of interorganizational relationships. For example, Rindfleisch (2000) found the nature of the relationship influences trust (firms are less trusting of a competitor partner), and that the effect of trust on alliance performance depends on the nature of that relationship. Rindfleish & Moorman (2001) found alliances with competitors to exhibit less reciprocity and closeness in addition to a higher level of information redundancy, which impacted the creativity of new product and process innovation. Zhang, Shu, Jiang and Malter (2010) found competition to effect knowledge acquisition and knowledge creation, which correspondingly influence innovative performance.

Alliance Scope, Alliances were classified according to the area(s) of responsibility allocated to the partner. This method was chosen because alliances often cover a wide breadth of activity. Respondents

were asked to identify all areas in which the partner contributed, and then asked to rank those contributions in order of importance. The scope of the alliance has the potential to effect the processes, objectives and relational factors of the collaboration. Alliance scope can determine value creation for the individual alliance as well as value accrued for the firm (Wu & Cavusgil, 2006) and has been shown to impact innovative output (Yang, Lin, & Peng, 2011).

E. Method of Analysis

Structural equation modeling (SEM) is a statistical method for modeling and testing causal relationships and effects simultaneously that offers a picture of interdependent relationships in a complex theoretical model. SEM allows the researcher to: (a) simultaneously consider relationships among multiple independent and dependent constructs, (b) construct unobservable latent variables, (c) provide estimates of measurement error for observed variables, and (d) statistically test a collection of propositions based theoretical assumptions against empirical data (Chin, 1998a, 1998b).

Compared to more well-known covariance-based methods of SEM (e.g. LISREL and AMOS) that typically use a maximum likelihood (ML) function, partial least squares (PLS) is a component-based approach that uses least squares (LS) estimation for testing structural equation models. Although not as popular as the covariance-based method, PLS has been increasingly applied in marketing and other business disciplines in recent years (Hair, Ringle, & Sarstedt, 2011). There are some benefits to using PLS over the traditional SEM approach. First, the PLS approach does not require a normal distribution of data (Chin, 1998b). Second, PLS does not face the problems of inadmissible solutions or factor indeterminacy (Fornell & Bookstein, 1982). PLS-SEM was chosen for this research because several assumptions of CB-SEM were violated in regards to the structural model and data characteristics, including: normality of distributions, minimal sample size, maximum model complexity, existence of Heywood cases and inflated parameter estimates' standard errors emerge (Hair et al., 2011). Specifically

the SmartPLS software (Ringle, Wende, & Will, 2005) was used to simultaneously assesses the psychometric properties of the measurement model and estimate the parameters of the structural model.

F. Summary

This chapter presented the research methodology for the study. The quantitative study design, including each of the three phases, was described. The selection of each of the two participant samples was discussed. Data collection procedures for each of the three phases were revealed. A detailed description of the survey was provided. Finally, the chapter closed with a discussion of the method of data analysis. Results of the data analysis are presented in the following chapter.

IV. ANALYSIS AND RESULTS

A. Introduction

This chapter presents an analysis of the survey responses. First a summary of survey response rates and descriptive analysis of the survey participants will be presented. Each construct will then be evaluated prior to the discussion of hypothesis testing. The chapter will conclude with a summary of the study's main findings.

B. Participation

The Association of Strategic Alliance Professionals (ASAP) has a dedicated member base that pays annually to receive benefits of that organization. In addition to the member base, they have a pool of non-members that are part of their communication distribution. This broader ASAP community consists of former members, individuals who have participated in ASAP events and professionals from partner organizations.

In total, 6,954 alliance professionals were invited to participate in the survey. A total of 294 individuals from 294 unique firms submitted survey responses. Out of those submissions, 20 responses were screened due to one of three reasons: 1) the firm lacked in strategic alliance experience 2) the individual responding lacked involvement in strategic alliances or 3) while in a strategic alliance role, the individual lacked awareness of their firms' alliance strategy. Another 71 of the responses were deemed to be incomplete. It was obvious some incomplete responses responded to a few questions and decided to opt out based on content. Other incomplete responses had partial responses to the survey before terminating. All those deemed to be "incomplete" were respondents that finished less than 50% of the survey prior to terminating their own response. After incompletes and screening there were 203 surveys in the data pool. These responses were then individually screened on two additional elements:

the ratio of blanks to completion and the level of respondent engagement (determined by the standard deviation of responses), leaving the final set of responses at 182. Click-through rates and detailed statistics may be seen in TABLE III, summary statistics are available in TABLE IV below.

TABLE III: SURVEY RESPONSE RATES

				Email Responses						Survey Responses			
Message #	**Date**	**Audience**	**Message**	**Sent**	**Delivered**	**Opened**	**Open Rate**	**Clicks**	**Click-through rate**	**Submitted**	**Screened**	**Incomplete**	**Completed**
1	25-Apr	Members	initial	2321	2298	495	22%	55	11%	34	0	11	23
	25-Apr	Nonmembers		5063	4732	753	16%	49	7%	32	1	4	27
2	2-May	Members	reminder	2320	2255	378	17%	79	21%	60	3	19	38
	2-May	Nonmembers		5057	4642	611	13%	72	12%	26	3	8	15
3	8-May	Members	extension	2316	2245	496	22%	73	15%	39	3	4	32
	7-May	Nonmembers		5052	4691	1069	23%	102	10%	52	3	13	36
4	13-May	Members	final	2305	2273	380	17%	37	10%	25	4	8	13
	13-May	Nonmembers		5020	4681	657	14%	39	6%	26	3	4	19
TOTALS				**7363**[a]	**6954**[a]	**4839**	**18%**	**506**	**10%**	**294**	**20**	**71**	**203**

[a] average of members and nonmembers for each mailing

TABLE IV: RESPONSE RATE SUMMARY

	Frequency	%
Sample Population	6954	
Opened Emails	4839	69.6
Survey Link Clicks	506	10.5
Survey Submissions	294	58.1
Complete Surveys	203	69.0
Response rate (Submissions / Sample Population)		4.2

1. Sample Description

Respondents provided demographic information on several areas: their individual role, their company, and the specific alliance in question. The majority of respondents were senior-level executives who managed multiple alliances and held long tenures at both their current firm and in their current role. The firms in question were overwhelmingly large firms with a great deal of breath and depth in strategic alliances. Firms in the technology and pharm-bio industries dominated the sample. While both the firm and individual respondent in question were responsible for many alliances, for a portion of the survey respondents were asked to think about a specific alliance that is "considered to be the most strategically important to your company". This alliance did not have to be currently active, but must have been active within the past three years. Specific alliances in question were primarily active, cross-industry, repeat alliances (those in which multiple initiatives have been completed). Partner-types ranged from competitors to suppliers to customers. Respondents were first asked to indicated what type of contributions the partner made to the alliance in question, and then asked to rank those contributions in order of importance. Again, there were a range of responses. However, the majority of respondents indicated technology and sales to be among the most important contributions. TABLES V, VI and VII provide additional detail on these demographics.

TABLE V: RESPONDENT CHARACTERISTICS

	Frequency	%	M	SD
Role[a]				
Owner/Co-Owner	17	9.3		
CEO	7	3.8		
VP, Strategic Alliances	27	14.8		
Director, Strategic Alliances	61	33.5		
Manager, Strategic Alliances	48	26.4		
VP, Business Development	7	3.8		
Director, Business Development	10	5.5		
Manager, Business Development	15	8.2		
Project Manager	5	2.7		
Other	11	6.0		
Years With Current Employer			10.0	9.1
Years in Current Role			5.2	5.7
Direct Reports			2.5	5.5
Alliances Managed			7.3	16.1

[a] Respondents could indicate more than one response, % based on total number of cases

TABLE VI: FIRM CHARACTERISTICS

	Frequency	%
Company Industry		
Telecom	1	0.5
IT	65	35.7
ITServ	15	8.2
FinServ	11	6.0
OtherServ	25	13.7
Pharm_Bio	41	22.5
OtherMan	10	5.5
PubSect	4	2.2
Other	10	5.5
Annual Revenue		
<5 Million	23	12.6
5-25 Mil	11	6.0
25100 Mil	11	6.0
100-250 Mil	7	3.8
250Mil-1Bil	16	8.8
1-5Bil	32	17.6
5Bil+	76	41.8
Missing	6	3.3
Firm Age		
0-5 Years	13	0.1
6-10 Years	13	7.1
11-15 Years	15	8.2
16-20 Years	14	7.7
21+ Years	126	69.2
Missing	1	0.5

TABLE VI: FIRM CHARACTERISTICS (continued)

	Frequency	%
Years of Alliance Experience		
0-1 years	9	4.9
2-4 years	23	12.6
5-7 years	25	13.7
8-10 years	16	8.8
Over 10 years	109	59.9
Alliances Formed in Last 5 Years		
Under 5 alliances	54	29.7
5 - 15 alliances	62	34.1
16 - 25 alliances	16	8.8
26 - 40 alliances	8	4.4
Over 40 alliances	40	22.0
Missing	2	1.1
Employees		
0-10	19	10.4
11-99	15	8.2
100-249	6	3.3
250-999	22	12.1
1,000-4,999	14	7.7
5,000+	105	57.7
Missing	1	0.5
Country		
Asia	8	4.4
Australia	6	3.3
Central America	1	0.5
Europe	23	12.6
Middle East	2	1.1
North America	139	76.4
South America	2	1.1
Sub-Saharan Africa	1	0.5

TABLE VII: ALLIANCE CHARACTERISTICS

	Frequency	%	M	SD
Partner Type[a]				
Supplier	67	36.8		
Customer	47	25.8		
Competitor	43	23.6		
Consultant	34	18.7		
Tech	21	11.5		
Complementary	15	8.2		
Sales	11	6.0		
Healthcare, Pharma, Biotech	8	4.4		
NGO	7	3.8		
Research Institute	6	3.3		
University	6	3.3		
Other	6	3.3		
Repeat Alliance				
Yes	143	78.6		
No	27	14.8		
Missing	12	6.6		
Active Alliance				
Yes	158	86.8		
No	7	3.8		
Missing	17	9.3		
Partner Contribution	*Rank #1*	*Rank #1*		
Technology	48	29		
Sales	36	30		
Channel & Distribution	14	16		
Marketing	12	22		
Development	12	23		
Research	11	16		
Other	8	3		
Supply	5	5		
Manufacturing	2	4		
N	148	148		
CrossIndustryAlliance				
No	59	32.4		
Yes	123	67.6		
Alliance Age			6.0	6.1
International Alliance				
Yes	46	25.3		
No	132	72.5		
Missing	4	2.2		

[a] Respondents could indicate more than one response, % based on total number of cases

1. Representativeness of Sample

Before proceeding with data analysis, several tests were conducted to identify potential non-response biases. Armstrong and Overton (1977) suggest that compared to early responders, late responders are more similar to non-responders. Thus, the first step was to compare key firm characteristics of early and late respondents for potential significant statistical differences. No significant differences were revealed *for number of employees, company age, company revenue, industry or number of strategic alliances,* suggesting non-response bias is not likely to be a problem. As a second step, survey results were compared to known population parameters provided to us by the ASAP Member / Non-Member Survey. Some of these demographics were for the total population; others were specific to either the member or non-member population. These demographics were compared using one sample t-tests and chi-square goodness of fit tests. At the .05 level of significance, there is not enough evidence to conclude proportions in the sample differ from the general ASAP population. Results of this comparison can be found in TABLE VIII.

TABLE VIII: SAMPLE REPRESENTATIVENESS

	ASAP Population		ASAP Members		ASAP Nonmembers	
	Sample	ASAP Data	Sample	ASAP Data	Sample	ASAP Data
Firm Demographics						
Industry						
Telecom	1%	4%				
IT	36%	29%				
ITServ	8%	9%				
FinServ	6%	6%				
OtherServ	14%	12%				
Pharm_Bio	23%	23%				
OtherMan	5%	4%				
PubSect	2%	3%				
Other	5%	10%				
Employees						
0-10			11%	5%	15%	16%
11-99			4%	4%	12%	13%
100-249			6%	1%	8%	6%
250-999			7%	13%	11%	12%
1,000-4,999			9%	6%	13%	9%
5,000+			64%	70%	42%	44%
Alliance Experience						
Under 5 alliances	30	32				
5 - 15 alliances	34.4	30				
16 - 25 alliances	8.9	9				
26 - 40 alliances	4.4	7				
Over 40 alliances	22.2	21				
Individual Demographics						
# Direct Reports			2.8	3.40	2.18	2.90
# Alliances Managed			6.49	8.8	8.23	12.4

C. Measurement Model

Following the Anderson and Gerbing two-step approach, the measurement model was validated prior to the analysis of the structural model to provide a confirmatory assessment of convergent validity and discriminant validity (Anderson & Gerbing, 1988). The measurement model revealed a good fit (x2 = 531.628, df = 299, p = .000, CFI = .904, NFI = .810, RMSEA = .066, ecvi = 4.429), however the review of standardized residual and modification indices suggested the removal of several additional items. Modifications were made to the initial measurement model in order to improve fit (see discussion within Absorptive Capacity scale below) and the final measurement model was revealed to be a better fit (x2 = 387.887, df = 234, p = .000, CFI = .924, NFI = .833, RMSEA = .060, ecvi = 3.425).

1. Analysis of the Absorptive Capacity Scale

For this study we have hypothesized absorptive capacity to consist of two components: potential absorptive capacity (PACAP) and realized absorptive capacity (RACAP). Previous research has utilized a variety of different factor structures for the construct and thus it was necessary to compare multiple models in order to determine the best fit and optimal solution for the measure. The first step in the process involved a confirmatory factor analysis of the 21-item, four dimension absorptive capacity scale. The confirmatory factor analysis highlighted several issues. First, high cross-loadings and modification indices greater than 10.0 were observed. Second, the majority of the reverse-worded items introduced a statistically significant amount of error in the ACAP measurement model. These results are consistent with research indicating that reverse worded items can distort results of factor analysis and reduce reliability and/or validity of measures (Schriesheim & Eisenbach, 1995). And finally, several items exhibited low loadings. In order to resolve these issues, problematic items were dropped from the final measure. The study does not include some items from the initial scale of PACAP (acquire1,

acquire3, acquire4) and some items from the initial scale of RACAP (transform2, transform4, transform5, apply2, apply3, apply6), leaving a scale of 6 indicators for PACAP and 6 indicators for RACAP.

After dropping items that displayed issues, a second CFA was conducted. While we conceptualized ACAP as a second-order construct with two first-order dimensions, we also recognized there can be a variety of alternative specifications for the relationships between a high-level construct and its dimensions (Law, Wong, & Mobley, 1998). For this reason, various alternative measurement models at the first-order and second-order levels were assessed. The cross-loadings highly suggested the best fit model would not include four distinct dimensions and this was confirmed when the four component model yielded a not positive definite covariance matrix. With ACAP as a second-order construct comprised of four complementary first-order dimensions (acquisition, assimilation, transformation, application), the result was negative error variances on both the transformation and application dimensions. We then considered potential absorptive capacity (PACAP) as a second-order latent factor shown by two dimensions (knowledge acquisition and assimilation) and realized absorptive capacity (RACAP) as a second-order latent factor (reflected by knowledge transformation and application). Again this model was found to have a not positive definite covariance matrix. There are a variety of reasons why we might find negative error variances and/or non positive definite covariance matrices, but they fall into three general areas: input/data error, identification issues or and model misspecification (Bagozzi & Yi, 1988; Wothke, 1993). Review of the data suggested it was not the cause of non-positive definiteness, suggesting an issue with the model. The findings on the three models suggested it was necessary to aggregate the measures by creating two composite constructs: potential absorptive capacity (acquisition and assimilation combine into one factor) and realized absorptive capacity (transformation and application combine into one factor). The confirmatory factor model

indicates and adequate fit of the potential and realized factor structure (x2 = 103.473, df = 52, p = .000, CFI = .940, NFI = .887, RMSEA = .074). In addition to the overall model fit, the internal structure of the model must also be assessed. Item reliabilities, standardized residuals and modification indices were also reviewed to identify potential areas of model misspecification (Bagozzi & Yi, 1988) and this revision resulted in the elimination of two additional items (acquire6 and assimilate3) in order to achieve a better model fit for the ACAP construct. The adjusted model revealed a better fit for the (x2 = 41.33, df = 33, p = .150, CFI = .986, NFI = .937, RMSEA = .037, ecvi = .582, AIC = 105.399). To confirm this factor structure, two dimension first-order model was given one second-order absorptive capacity variable, which resulted in negative error variance for the RACAP dimension. Finally, a single-factor model with all items as one measure of ACAP suggested an equally good fit (x2 = 43.14, df = 34, p = .129, CFI = .985, NFI = .934, RMSEA = .039. ecvi=.582, AIC=105.414). A chi-square difference test between the one-factor and two-factor models was insignificant (df=4, p>.10). The two-factor RACAP and PACAP model was selected as it has been validated in a variety of other studies (e.g. Ben-Oz & Greve, forthcoming; Camisón & Forés, 2010) and conforms to theory. The final measure is displayed in Figure 6.

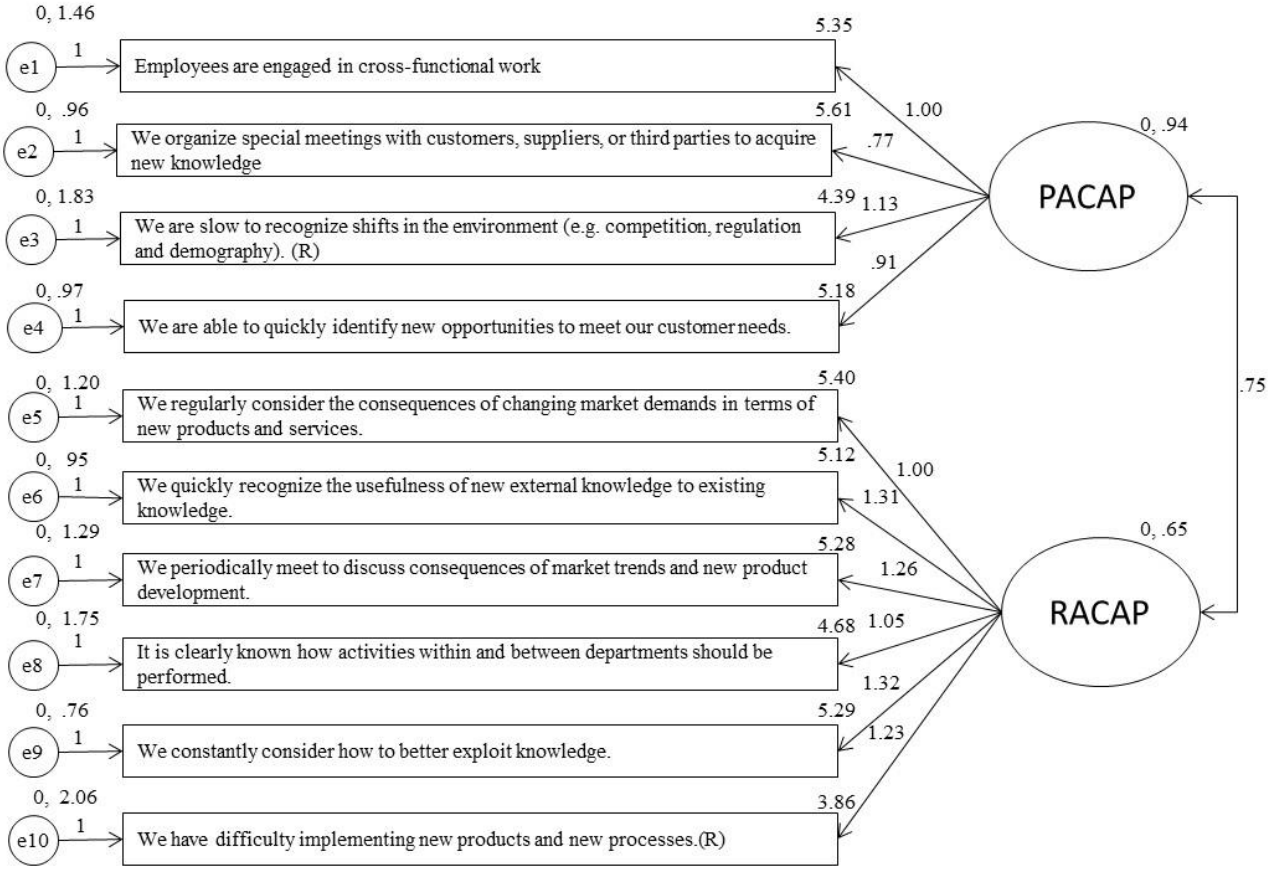


Figure 6. Confirmatory analysis of the absorptive capacity construct

The large overlap in the original item set ensures that the scale still measures the desired areas. Acquisition, the ability to identify and acquire external knowledge (Zahra & George, 2002) is measured by items pertaining to cross-functional teamwork and gathering and acquiring information both within and without the industry. Assimilation, the processes for analyzing and interpreting external information, is measured by items focusing on the ability to understand new knowledge. Transformation, the ability to combine old and new knowledge, is measured by items intended to capture the processes involved in recognizing the opportunities afforded by new knowledge. And finally, application, includes items that

captures a firms' ability to incorporate acquired and transformed knowledge into operations. TABLE IX indicates the original items and those that were dropped.

TABLE IX: ABSORPTIVE CAPACITY MEASURE

PACAP	
Acquire1	*We have frequent interactions with others in the industry to acquire new knowledge.*
Acquire2	Employees are engaged in cross-functional work
Acquire3	*We collect information through informal means (e.g. lunch or social gatherings with customers and suppliers, trade partners and other stakeholders).*
Acquire4	*We are hardly in touch with other firms and stakeholders in the industry.(R)*
Acquire5	We organize special meetings with customers, suppliers, or third parties to acquire new knowledge
Acquire6	*We regularly approach third parties outside the industry (such as professional organizations) to gather information*
Assimiliate1	We are slow to recognize shifts in the environment (e.g. competition, regulation and demography). (R)
Assimiliate2	We are able to quickly identify new opportunities to meet our customer needs.
Assimiliate3	*We quickly analyze and interpret changing market demands.*
RACAP	
Transform1	We regularly consider the consequences of changing market demands in terms of new products and services.
Transform2	*Employees record and store newly acquired knowledge for future reference.*
Transform3	We quickly recognize the usefulness of new external knowledge to existing knowledge.
Transform4	*Employees hardly share practical experiences with one another.(R)*
Transform5	*Grasping the opportunities from new external knowledge is a laborious undertaking. (R)*
Transform6	We periodically meet to discuss consequences of market trends and new product development.
Apply1	It is clearly known how activities within and between departments should be performed.
Apply2	*Client complaints often fall on deaf ears.(R)*
Apply3	*We have a clear division of roles and responsibilities.*
Apply4	We constantly consider how to better exploit knowledge.
Apply5	We have difficulty implementing new products and new processes.(R)
Apply6	*Our employees have a common language regarding our products and services.*

Items in intalics have been dropped

2. Analysis of Knowledge Network Capability Scale

Knowledge network capability (KNC) was hypothesized to have a singular component. To verify this structure, a PCA was conducted in which all eigenvalues greater than 1 were to be extracted. To maximize the variance between factors, Varimiax rotation solution was selected. As predicted, only one component was extracted. One factor (EXPRET3) clearly loaded below recommended levels and was dropped from further analysis. However, a second factor (EXPRET2), while meeting required minimums, was also quite low. The full component matrix is available below in Table X. A scale analysis was conducted in SPSS to determine whether or not the specific item should be excluded from analysis and did not demonstrate improvement when the item was removed. However, in validity testing the inclusion of EXPRET2 yielded an AVE slightly below .50 and it was eventually removed to ensure convergent validity.

TABLE X: KNOWLEDGE NETWORK CAPABILITY ROTATED COMPONENT MATRIX

In my organization…		Component 1
EXPLOC1	We possess a good map of individual, group and partners' talents and skills.	.719
EXPLOC2	We assign tasks to commensurate with task-relevant knowledge and skill.	.811
EXPLOC3	Individuals know what task-related skills and knowledge they each possess.	.743
EXPLOC4	When facing a task or obstacle outside of our expertise, we easily determine who would have the necessary information or skills to solve the task or surmount the obstacle.	.743
EXPRET1	When confronted with a task or problem in which we do not possess all the necessary expertise, we coordinate the retrieval of information from known "experts."	.689
EXPRET2	*Knowing what other people know allows us to retrieve information beyond personal networks, group boundaries, and even organizational boundaries.*	*.619*
EXPRET3	*We often rely on external partners for required knowledge that we do not specifically possess.*	*.428*
EXPRET4	We consciously build ties with known "experts" in order gain actual access to that expert knowledge should a need arise.	.686

Rotation Method: Varimax with Kaiser Normalization.
Items in italics have been dropped

3. Analysis of Alliance Portfolio Success Scale

The majority of performance measures in the study utilized single-item measures, except for the case of firm-level alliance success which consisted of four items with one (hypothesized) component solution. Item loadings ranged from .79-.84 and the Cronbach alpha was .83, which corresponded to the 0.842 Cronbach's alpha obtained in the original Hurmelinna-Laukkanen et al (2012) study.

D. Validity and Reliability of the Instrument

Before results are interpreted, best practices suggest the psychometric properties (e.g., factor structure, reliability) of the survey instrument and the relationship between various factors are evaluated. All conceptually relevant constructs are significantly correlated at the .05 level, indicating strong convergent validity. Small and insignificant correlations between individual-alliance incremental innovation and portfolio-level radical innovation and individual-alliance incremental innovation and KNC were not unexpected as neither of these relationships was hypothesized to be directly relevant to this study. Certain correlations among dimensions were higher than .70, suggesting the possibility of multicollinearity. Multicollinearity diagnostics were examined and it was determined high correlations do not create a multicollinearity problem as the variance inflation factors (VIF) fall below the suggested threshold (Hair et al., 2011).

TABLE XI: CORRELATION MATRIX OF THE CONSTRUCTS

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1 PACAP	5.13	1.48	1.00									
2 RACAP	4.85	1.54	0.75**	1.00								
3 KNC	5.23	1.41	0.66**	0.75**	1.00							
4 PORTPERF	5.55	1.21	0.48**	0.48**	0.41**	1.00						
Single Item Indicators												
5 PORTRADICAL	4.55	1.14	0.34**	0.33**	0.36**	0.49**	1.00					
6 PORTINCREMENTAL	3.72	0.99	0.28**	0.29**	0.25**	0.38**	0.29**	1.00				
7 TRUST	5.54	1.26	0.33**	0.37**	0.28**	0.73**	0.26**	0.30**	1.00			
8 SAPERF	5.56	1.00	0.19*	0.23**	0.20**	0.54**	0.33**	0.36**	0.42**	1.00		
9 SARADICAL	4.95	1.70	0.26**	0.24**	0.30**	0.35**	0.60**	0.29**	0.17*	0.37**	1.00	
10 SAINCREMENTAL	5.28	1.53	0.17*	0.15*	0.10	0.22**	0.14	0.62**	0.19*	0.40**	0.26**	1.00
Controls												
11 COAGE	4.25	1.29	-0.25**	-0.26**	-0.17*	-0.11	0.11	-0.13	-0.08	0.02	-0.01	-0.11
12 COEMP	4.72	1.79	-0.24**	-0.24**	-0.23**	-0.11	0.06	-0.07	-0.13	0.00	-0.05	-0.16*
13 ITIndustry	0.36	0.48	0.03	0.00	-0.02	-0.08	-0.03	0.01	0.00	-0.03	-0.01	0.04
14 ITServIndustry	0.08	0.28	0.06	0.03	-0.04	0.06	0.06	0.12	0.04	0.01	0.09	0.08
15 PharmBioIndustry	0.23	0.42	-0.06	0.07	0.06	0.05	0.11	-0.14	-0.03	-0.04	0.10	-0.19**
16 FinsvcIndustry	0.06	0.24	-0.13	-0.03	-0.02	-0.13	-0.19**	-0.19**	-0.05	-0.09	-0.16*	-0.14
17 OtherManIndustry	0.05	0.23	-0.14	-0.16*	-0.17*	-0.02	-0.04	0.02	0.07	0.05	-0.12	0.00
18 OtherServIndustry	0.14	0.35	0.14	0.07	0.13	0.08	-0.03	0.12	0.01	0.06	-0.06	0.16*
19 AllianceExperience	4.06	1.30	-0.07	-0.05	0.01	-0.01	0.18*	-0.02	0.00	0.07	0.07	-0.04
20 Competitor	0.23	0.42	-0.02	0.10	0.05	-0.02	0.04	-0.09	-0.01	-0.02	0.02	-0.05
21 RepeatAlliance	0.84	0.37	0.15*	0.13	0.02	0.02	0.16*	0.08	0.10	0.05	0.10	0.15*
22 DevPartner	0.76	0.43	0.06	0.05	0.07	0.02	-0.13	-0.08	0.03	-0.03	-0.17*	-0.04
23 DistPartner	0.64	0.48	0.04	0.07	0.06	0.12	0.15*	0.12	0.09	0.01	0.17*	0.01
24 ManufPartner	0.28	0.45	0.00	0.02	0.04	0.05	-0.05	0.02	0.15*	-0.05	-0.04	0.10
25 MktgPartner	0.88	0.33	0.09	0.06	0.03	0.03	-0.01	-0.06	0.05	-0.06	0.03	-0.09
26 RsrchPartner	0.60	0.49	-0.16*	-0.16*	-0.19**	-0.14	-0.22**	-0.13	-0.06	0.00	-0.26**	-0.04
27 SalesPartner	0.76	0.43	0.09	0.04	0.04	0.11	0.03	0.00	0.10	-0.07	0.09	-0.03
28 SupplyPartner	0.43	0.50	0.04	-0.01	-0.06	0.09	-0.07	0.00	0.17*	0.05	-0.11	0.01
29 TechPartner	0.76	0.43	0.07	0.06	0.04	0.01	-0.15*	-0.10	0.10	-0.07	-0.23**	-0.11

Note: this was a two-tailed test; *correlations significant at level of p<.05; **corelations are significant at the level of p<.01

TABLE XI: CORRELATION MATRIX OF THE CONSTRUCTS (CONTINUED)

Variables	M	SD	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1 PACAP	5.13	1.48																			
2 RACAP	4.85	1.54																			
3 KNC	5.23	1.41																			
4 PORTPERF	5.55	1.21																			
Single Item Indicators																					
5 PORTRADICAL	4.55	1.14																			
6 PORTINCREMENTAL	3.72	0.99																			
7 TRUST	5.54	1.26																			
8 SAPERF	5.56	1.00																			
9 SARADICAL	4.95	1.70																			
10 SAINCREMENTAL	5.28	1.53																			
Controls																					
11 COAGE	4.25	1.29	1.00																		
12 COEMP	4.72	1.79	0.73**	1.00																	
13 ITIndustry	0.36	0.48	0.10	0.20**	1.00																
14 ITServIndustry	0.08	0.28	-0.06	0.00	-0.22**	1.00															
15 PharmBioIndustry	0.23	0.42	0.02	0.02	-0.40**	-0.16*	1.00														
16 FinsvcIndustry	0.06	0.24	0.11	0.09	-0.19*	-0.08	-0.14	1.00													
17 OtherManIndustry	0.05	0.23	0.14	0.16*	-0.18*	-0.07	-0.13	-0.06	1.00												
18 OtherServIndustry	0.14	0.35	-0.19*	-0.32**	-0.30**	-0.12	-0.22**	-0.10	-0.10	1.00											
19 AllianceExperience	4.06	1.30	0.62**	0.54**	0.07	0.03	0.13	-0.08	0.06	-0.14	1.00										
20 Competitor	0.23	0.42	0.06	0.13	-0.05	-0.07	0.27**	-0.03	-0.13	-0.07	0.15	1.00									
21 RepeatAlliance	0.84	0.37	0.10	0.08	0.24**	0.13	-0.22	-0.20**	-0.09	-0.04	0.08	0.00	1.00								
22 DevPartner	0.76	0.43	-0.13	-0.10	-0.05	0.06	-0.22**	0.14	-0.03	0.13	-0.23**	-0.09	-0.03	1.00							
23 DistPartner	0.64	0.48	-0.06	-0.04	-0.23**	0.01	0.13	-0.07	0.09	0.10	-0.06	0.01	-0.20**	0.02	1.00						
24 ManufPartner	0.28	0.45	-0.18*	-0.18*	0.14	0.05	-0.33**	0.07	-0.12	0.12	-0.22**	-0.06	-0.03	0.26**	0.04	1.00					
25 MktgPartner	0.88	0.33	0.07	-0.03	-0.24**	-0.11	0.31**	-0.03	0.04	-0.02	0.06	0.05	-0.22**	-0.06	0.40**	-0.16*	1.00				
26 RsrchPartner	0.60	0.49	-0.05	0.02	0.07	0.10	-0.26**	0.16*	0.00	0.04	-0.12	-0.11	0.00	0.37**	-0.07	0.23**	-0.20**	1.00			
27 SalesPartner	0.76	0.43	0.03	-0.06	-0.25**	-0.08	0.24**	-0.03	0.09	-0.07	-0.04	0.01	-0.10	0.01	0.30**	-0.07	0.58**	-0.28**	1.00		
28 SupplyPartner	0.43	0.50	-0.07	-0.01	0.07	-0.10	-0.07	0.02	0.00	-0.01	-0.09	-0.03	-0.07	0.19*	0.11	0.51**	-0.04	0.17*	-0.02	1.00	
29 TechPartner	0.76	0.43	-0.25**	-0.29**	-0.12	-0.20**	0.12	0.08	-0.11	0.15*	-0.27**	0.00	-0.12	0.28**	-0.11	0.12	0.01	0.14	0.05	0.08	1.00

Note: this was a two-tailed test; *correlations significant at level of p<.05; **corelations are significant at the level of p<.01

1. Common Method Bias

To examine reliability issues associated with single-informant data, we next looked for evidence of a common method variance (CMV) that can result when the measurement technique introduces systematic variance into a measure. Before testing the hypotheses, we used a CFA approach to Harman's one-factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) to assess whether CMV constituted a problem in the testing. One single factor did emerge as accounting for 40% of the variance among the measures, suggesting the existence of common method variance. It is important to note that Harman's test has been deemed to be generally insensitive, and while the text extracts covariance it does not identify the reason for that covariance. One factor may account for the covariance in the variables if are highly correlated due to valid functional relationships between them (Podsakoff & Organ, 1986) – which is likely the case here. However, the possibility of a CMV effect was raised and thus additional steps were taken. CMV implies that the variance in observed scores is partially attributable to a methods effect, and common method bias refers to magnitude of the discrepancies between observed and true relationships that are created altered due to that effect (Doty & Glick, 1998). Thus CMV may not necessarily be problematic if the bias is trivial in magnitude. The important issue is not the significance of CMV, but what the level of common method bias is.

The correlations observed may be due, in part, to CMV related to the mode of report for the KNC, PACAP and RACAP variables. If the correlations were due to CMV, one would expect the correlations among the self-report variables to maintain consistent regardless of sample segmentation (Ferris & Aranya, 1983). The sample was segmented on the basis of a non-attitudinal variable: whether or not the alliance was intra- or inter-industry. If the relationship between the variables is, in fact, due to CMV, then we would expect the correlation between these variables to be the same regardless of this non-attitudinal variable. The result of the correlation analysis, however, revealed that the correlation between the latent variables varied based on whether the alliance was intra- or inter-industry. To confirm this result, a second

non-attitudinal variable was selected: company age. The result was the same. The correlation between the latent variables varied based on both firm and alliance demographics. Additionally, analysis of discriminant and convergent validity (to follow) further indicate that CMV was unlikely to be a serious problem (Podsakoff & Organ, 1986; Podsakoff et al., 2003). Hence, common method variance is not a concern in this study.

2. Construct Validity

The internal consistency of measures was assessed in terms of both Cronbach's alpha and composite reliability. Both Cronbach's alpha (Nunnally, 1978), and composite reliability (Hair et al., 2011) have a recommended threshold of .70. While Cronbach's alpha is the most widely used measure, composite reliability is actually preferred in the case of PLS models (Henseler, Ringle, & Sinkovics, 2009). In this case, all constructs met (or exceeded) .70 for both Cronbach's alpha and composite reliability, suggesting the measures possess a strong internal consistency (see TABLE XII.)

For the assessment of validity, two broad criteria are generally examined: the convergent validity and the discriminant validity. Convergent validity is shown when each measurement item correlates strongly with its assumed theoretical construct. Discriminant validity demonstrates the degree to which a measurement scale reflects only characteristics from that particular construct, demonstrated when each measurement item correlates weakly with all other constructs except for the one to which it is theoretically associated.

C*onvergent validity* is demonstrated through PLS in a two-stage analysis. First, each of the measurement items was verified to load with a significant *t-value* on its latent construct (Gefen & Straub, 2005). Significant t-values are confirmed when the Outer Model Loadings are above 1.96 ($t \geq 1.96$; $\alpha = 0.5$). Second, the standardized factor loadings were reviewed. Values of individual item loadings should ideally meet or exceed 0.70 (Chin, 1998a; Hair et al., 2011), however 0.6 has been deemed acceptable if deleting the indicator does not provide improvement to composite reliability. The majority of items did exceed 0.7,

with the exception of three items within PACAP: apply1, apply5, transform1. However, each of these items did exceed 0.6, and are thus considered acceptable, verifying convergent validity of all the items. Additionally, it has been suggested that an Average Variance Extracted (AVE) value of at least.50 (the latent variable thus explains half, or more, of the indicators variance) indicates convergent validity (Hair et al., 2011). All latent variables AVE exceeded 0.5, further confirming convergent validity.

TABLE XII: CONSTRUCT RELIABILITY AND CONVERGENT VALIDITY

Constructs and items	Loading [a]	t-value [b]	Cronbach Alpha	Composite Reliability	Variance Extracted
PACAP			0.73	0.83	0.55
ACQUIRE2	0.72	13.37			
ACQUIRE5	0.74	16.61			
ASSIMILATE1	0.74	18.99			
ASSIMILATE2	0.76	17.97			
RACAP			0.81	0.86	0.52
APPLY1	0.66	12.97			
APPLY4	0.80	28.21			
APPLY5	0.66	13.73			
TRANSFORM1	0.64	7.80			
TRANSFORM3	0.79	18.81			
TRANSFORM6	0.74	17.81			
Knowledge Network			0.84	0.88	0.56
EXPLOC1	0.72	16.54			
EXPLOC2	0.82	25.20			
EXPLOC3	0.73	16.11			
EXPLOC4	0.77	19.05			
EXPRET1	0.71	12.54			
EXPRET4	0.72	17.48			
Firm Alliance Perf			0.83	0.89	0.66
PORTPERF1	0.84	30.60			
PORTPERF2	0.79	22.30			
PORTPERF3	0.83	20.20			
PORTPERF4	0.79	18.21			

[a] Standardized factor loadings.

[b] All *t* -values are highly significant at $p<0.001$ (requires *t* -values above 3.291).

Discriminant validity is demonstrated through two methods. First, the correlation of the latent variable scores with all measurement items was reviewed for an appropriate pattern of loadings. As defined by discriminant validity, the measurement items must load highly on their theoretically assigned factor and not highly on other factors. As seen in TABLE XIII, there is no serious cross-factor loading of items.

TABLE XIII: LOADINGS AND CROSS-LOADINGS,
RELEVANT STUDY FACTORS

	PACAP	RACAP	KNC	PORTPERF
ACQUIRE2	0.72	0.53	0.46	0.43
ACQUIRE5	0.74	0.49	0.51	0.35
ASSIMILATE1	0.74	0.58	0.43	0.27
ASSIMILATE2	0.76	0.60	0.52	0.36
TRANSFORM1	0.48	0.64	0.45	0.16
TRANSFORM3	0.58	0.79	0.56	0.38
TRANSFORM6	0.56	0.74	0.56	0.34
APPLY1	0.38	0.66	0.56	0.36
APPLY4	0.65	0.80	0.64	0.45
APPLY5	0.54	0.66	0.42	0.34
EXPLOC1	0.44	0.57	0.72	0.32
EXPLOC2	0.48	0.58	0.82	0.25
EXPLOC3	0.43	0.51	0.73	0.26
EXPLOC4	0.49	0.56	0.77	0.32
EXPRET1	0.48	0.49	0.71	0.23
EXPRET4	0.56	0.60	0.72	0.43
PORTPERF1	0.40	0.40	0.38	0.84
PORTPERF2	0.35	0.35	0.27	0.79
PORTPERF3	0.35	0.42	0.31	0.83
PORTPERF4	0.45	0.41	0.38	0.79

Because the correlations between the some of the latent constructs were relatively high, we used a complimentary test advocated by Anderson and Gerbing (1988) to further investigate discriminant validity. In this test, we calculated confidence intervals of plus or minus two standard errors around the correlation for the factors. If the interval does not include 1.0, discriminant validity is demonstrated. None of the confidence intervals included 1.0, and thus, the constructs may be interpreted as independent.

TABLE XIV: TEST FOR DISCRIMINANT VALIDITY

Variables	Correlation	95% CI	99% CI
PACAP, RACAP	0.74	.663-.797	.636-.813
PACAP, KNC	0.65	.555-.725	.523-.746
PACAP, PORTPERF	0.47	.353-.579	.312-.609
RACAP, KNC	0.74	.667-.800	.641-.816
RACAP, PORTPERF	0.51	.390-.607	.350-.635
KNC, PORTPERF	0.41	.281-.524	.238-.557

E. Structural Model

In order to assess the structural model, a bootstrapping technique was applied in which the number of bootstrap samples was 1,000, and the number of cases (182) was equal to the number of observations in the original sample (Chin, 2010). After examination of the theoretical model, additional paths were added to conduct a mediation analysis. In total, three models were analyzed: one base model, and two mediation models. Additionally, to account for the differences among organizations, we analyzed the full model with and without control variables that characterize the organizations and their alliances. In this case we looked for the weight and significance of the path in addition the contribution the variable made to the R-square value of endogenous values. The control variables yielded statistically insignificant paths

with low weights, and their presence did not affect path weights among the major constructs in the model. Thus, following precedent with PLS modeling (Hair, Ringle, & Sarstedt, 2013) control variables are not included in the final model or part of analysis and interpretation.

In particular, the outcomes of the structural model in terms of direct effects, bootstrapping and t-statistics confirmed the majority of hypotheses, at various significance levels (Figure 8). Specifically, KNC has both with a very strong significant relationship with PACAP (H1a at $p<0.001$ level) and RACAP (H1b at $p<.001$ level). In addition, the model demonstrates PACAP is positively related to RACAP (H2). We can also see from the model that TRUST mediates the relationship between RACAP and both alliance and firm-level performance (H6a,b; H7a,b; H8a,b). Further discussion and detailed mediation analysis will follow, in addition to the testing and analysis for the relationship between the knowledge sourcing strategies and innovative outcomes. Results are presented in Figure 8. Dotted lines highlight the insignificant paths.

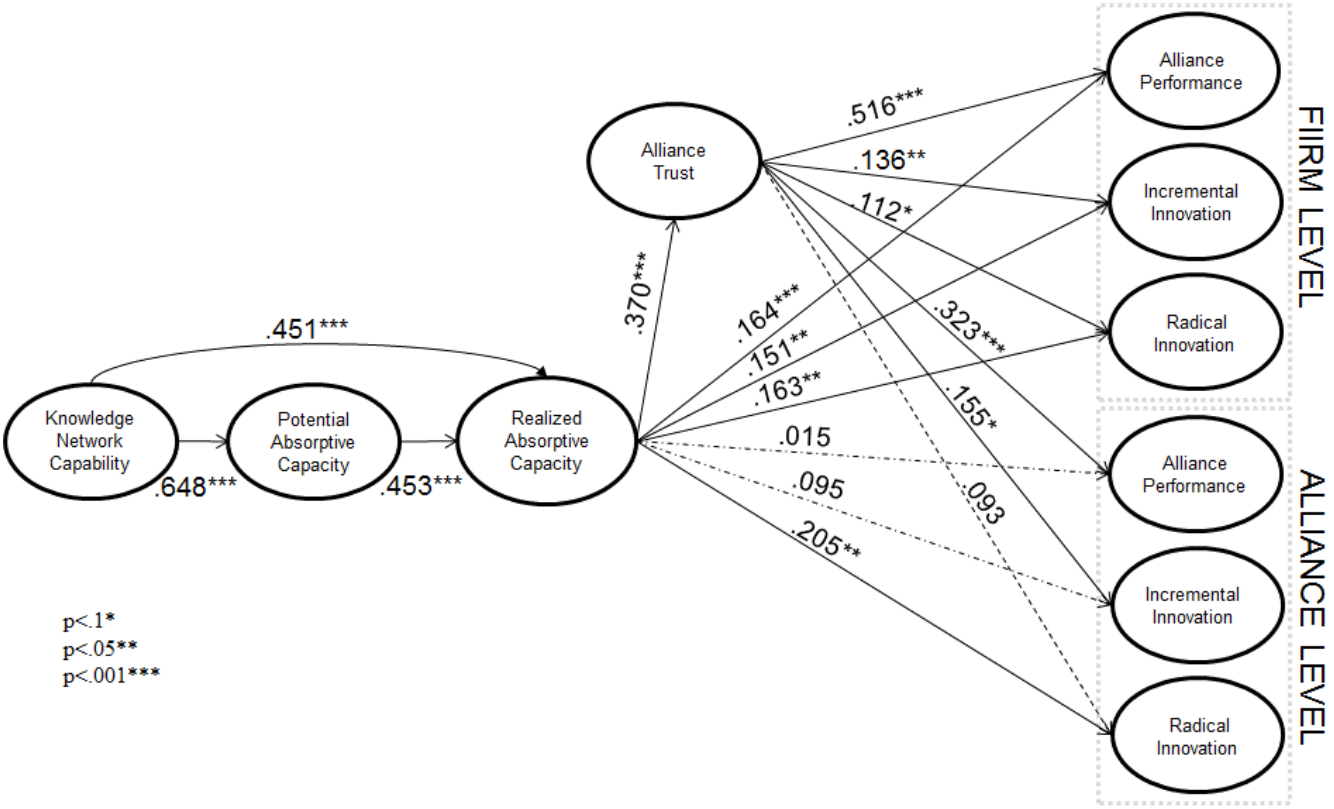


Figure 7. Structural model

1. Hypothesis Testing

A major emphasis in PLS analysis is on variance explained (R^2 measures) as well as establishing the significance of all path estimates (Chin, 2010; Hair et al., 2011). We begin by looking at the R-squares for each dependent LV in the structural model provided by PLS. R^2 values of 0.67, 0.33, or 0.19 for endogenous latent variables in the structural model can be described as substantial, moderate, or weak, respectively (Chin, 1998a). Second, the path coefficients were evaluated through examination of the t-values was based on a two-tail test with statistically significant levels of 1.65 (significance level =

10 percent), 1.96 (significance level = 5 percent), and 2.58 (significance level = 1 percent) (Hair et al., 2011). TABLE XV provides the model results.

TABLE XV: FULL MODEL RESULTS

	Trust, All Performance
KNC --> PACAP	0.6483*** *0.0498*
KNC --> RACAP	0.4509*** *0.0636*
PACAP --> RACAP	0.4527*** *0.0654*
RACAP --> PORTFPERF	0.1643*** *0.0469*
RACAP --> PORTINCREMENTAL	0.1513** *0.061*
RACAP --> PORTRADICAL	0.1626** *0.0682*
RACAP --> SAPERF	0.0145 *0.0607*
RACAP --> SAINCREMENTAL	0.095 *0.0674*
RACAP --> SARADICAL	0.2051** *0.0757*
PORTINCREMENTAL --> PORTPERF	0.0403 *0.0554*
PORTRADICAL --> PORTPERF	0.2174*** *0.0569*
SAINCREMENTAL --> PORTINCREMENTAL	0.5669*** *0.0678*
SAINCREMENTAL --> SAPERF	0.2713*** *0.075*
SARADICAL --> PORTRADICAL	0.5376*** *0.0634*
SARADICAL --> PORTFPERF	0.2457** *0.0752*
SAPERF --> PORTFPERF	0.1950** *0.0620*
RACAP --> TRUST	0.3702*** *0.0639*

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; standard error terms are shown in italics.

TABLE XV: FULL MODEL RESULTS (CONTINUED)

	Trust, All Performance
TRUST --> PORTFPERF	0.5158***
	0.0608
TRUST --> PORTINCREMENTAL	0.1361**
	0.0619
TRUST --> PORTRADICAL	0.1115*
	0.0655
TRUST --> SAINCREMEMENTAL	0.155*
	0.0823
TRUST --> SAOVERALL	0.3234***
	0.0789
TRUST --> SARADICAL	0.0933
	0.0769
Explained Variance: R^2	
PORTFPERF	.681
PORTINCREMENTAL	.434
PORTRADICAL	.403
SAPERF	.340
SAINCREMENTAL	.044
SARADICAL	.065

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; standard error terms are shown in italics.

a. Knowledge Network on Absorptive Capacity

The first research question addressed in this study sought to understand the relationship between the knowledge network capability and absorptive capacity. The associated hypothesis [H1a, H1b] sought to confirm that the KNC is an antecedent to both PACAP [H1a] and RACAP [H1b]. Figure 8 clearly details that the KNC significantly influences both PACAP (.65, p<.001) and RACAP (.75 p<.001), supporting the hypothesis. Higher levels of knowledge network capability are positively associated with higher levels of absorptive capacity.

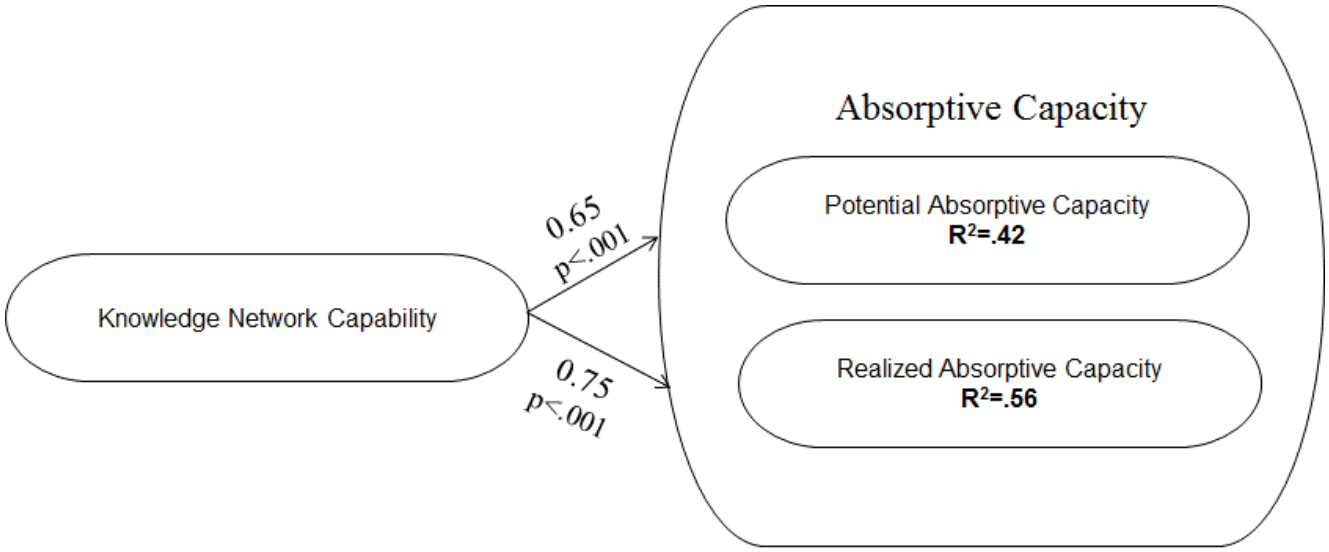


Figure 8. Knowledge network on absorptive capacity results

b. Potential and Realized Absorptive Capacity

The second research question sought to confirm the relationship between potential and realized absorptive capacity. It was hypothesized that PACAP is positively associated with RACAP [H2]. A positive relationship between PACAP and RACAP is confirmed (.45 $p<.001$), supporting the hypothesis. To elaborate on the PACAP-RACAP relationship, we further investigated the three-way relationship between KNC, PACAP and RACAP. Confirming the positive relationship between KNC and the dimensions of ACAP in addition to the positive relationship between PACAP and RACAP would suggest that PACAP partially mediates the relationship between the KNC and RACAP. We can verify this by looking at Figure 9. When we include PACAP into the model with KNC and RACAP the direct effect from KNC to RACAP becomes smaller, yet remains statistically significant (Chin, 2010).

Figure 9. PACAP – RACAP Relationship Results

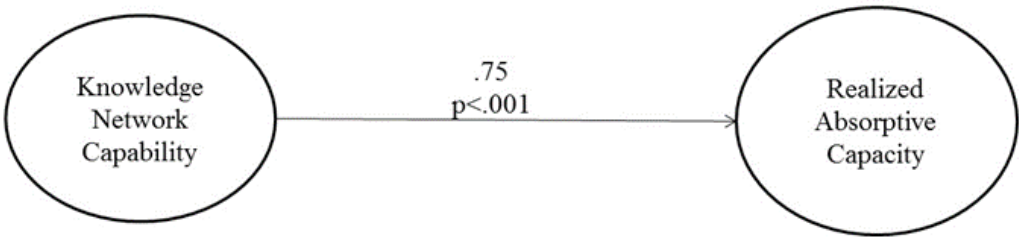


Figure 9B. KNC direct to RACAP

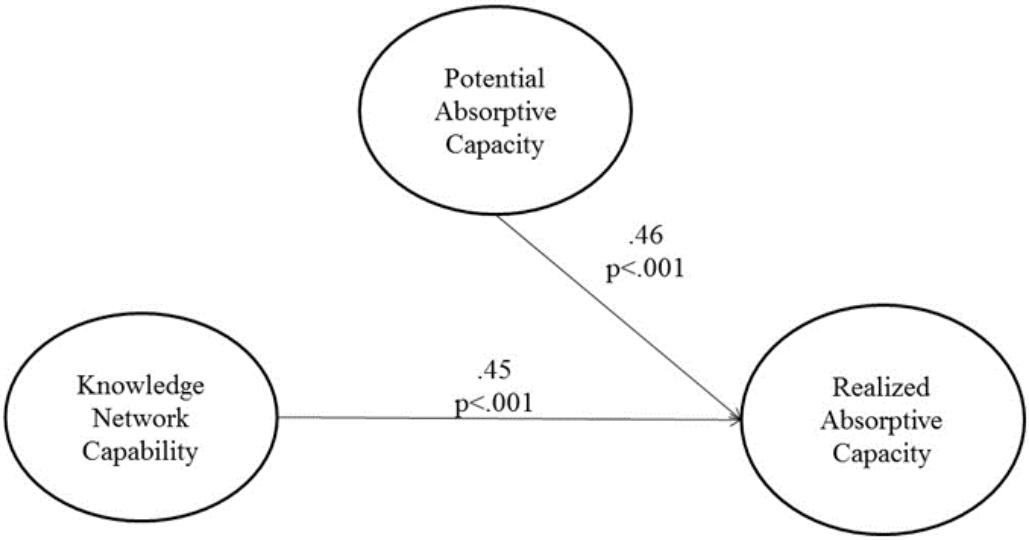
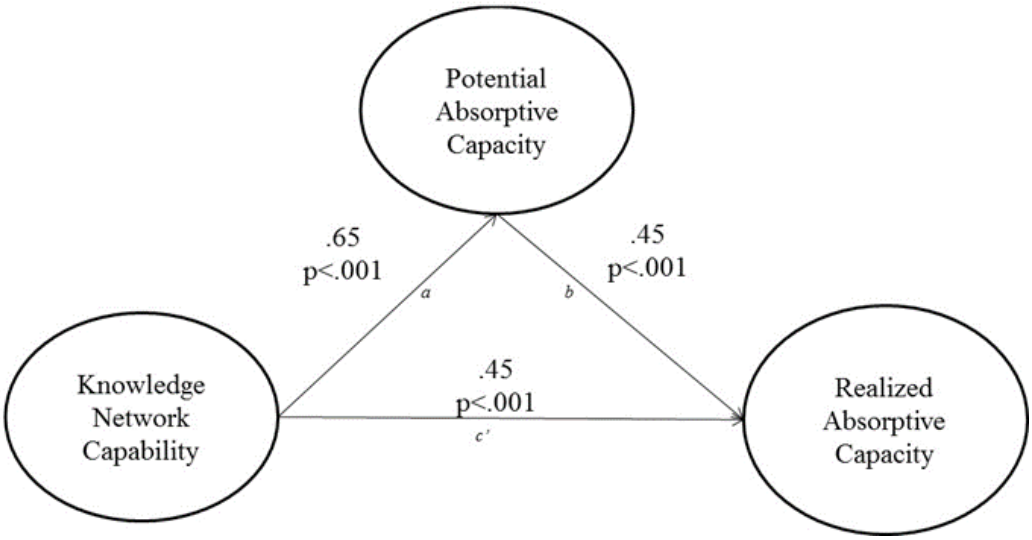


Figure 9C. KNC, PACAP direct to RACAP



c. Absorptive Capacity on Performance

Hypotheses 3-5 suggest that ACAP has a positive influence on alliance performance and innovative performance at both the portfolio and the individual alliance level. Testing these hypothesis involved an analysis of the baseline model. Each of the hypothesis was fully supported. I confirmed a positive relationship between RACAP and portfolio performance (.32 $p<.001$), portfolio incremental innovation (.20 $p<.01$) and portfolio radical innovation (.20 $p<.001$) supporting hypotheses H3a, H4a and H5a, respectively. Hypothesis H3b, H4b and H5b were also supported when the positive relationship between RACAP and individual alliance performance (.12 $p<.05$), alliance incremental innovation (.15 $p<.01$) and alliance radical innovation (.24 $p<.001$) were confirmed. The full baseline model can be seen in TABLE XVI.

TABLE XVI: BASELINE MODEL RESULTS

	Path Estimate
KNC --> PACAP	0.6483***
	0.0486
KNC --> RACAP	0.4504***
	0.064
PACAP --> RACAP	0.4533***
	0.0639
RACAP --> PORTPERF	0.32***
	0.0589
RACAP --> PORTINCREMENTAL	0.1986**
	0.0631
RACAP --> PORTRADICAL	0.2019**
	0.0656
RACAP --> SAPERF	0.1234*
	0.0657
RACAP --> SAINCREMENTAL	0.1521**
	0.0613
RACAP --> SARADICAL	0.239***
	0.0721
PORTINCREMENTAL --> PORTPERF	0.1926**
	0.0657
PORTRADICAL --> PORTPERF	0.3311***
	0.0697
SAINCREMENTAL --> PORTRADICAL	0.5857***
	0.0717
SAINCREMENTAL --> PORTPERF	0.3115***
	0.0726
SARADICAL --> PORTRADICAL	0.5472***
	0.0579
SARADICAL --> PORTPERF	0.264***
	0.0738
Explained Variance: R^2	
PORTPERF	.393
PORTINCREMENTAL	.418
PORTRADICAL	.393
SAPERF	.252
SAINCREMENTAL	.023
SARADICAL	.057

*Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$;*
standard error terms are shown in italics.

d. Mediator: Alliance Trust

Our last hypotheses states that trust partially mediates the relationship between RACAP and performance at the portfolio and individual alliance level. To test this hypothesis I compared three different models: a baseline model (in which alliance trust was not included), a second model in which alliance trust was related only to performance at the portfolio level, and a third model in which alliance trust was proposed to mediate the relationship between RACAP and all levels/types of performance. These models can be found in TABLE XVII. The hypothesis received partial support, in that trust was a mediator between RACAP and both portfolio and individual alliance performance, but the relationship varied for the performance type. In the case of portfolio-level performance, alliance trust partially mediated the relationship between RACAP, alliance performance (H6a), incremental innovation (H7a), and radical innovation (H8a). The paths between alliance trust and each of the portfolio-level performance variables are significant. Additionally, when we compare the baseline model to the second model, including alliance trust causes the direct effect from RACAP to alliance portfolio performance, portfolio incremental innovation and portfolio radical innovation each to become smaller, yet remain statistically significant. Thus, H6a, H7a and H8a are confirmed. In the case of individual alliance performance we find a slightly different outcome. In this case, alliance trust *fully mediates* the relationship between RACAP and both individual alliance performance (H6b) and incremental innovation for the alliance (H7b). This is demonstrated as the addition of alliance trust changes the paths between RACAP to individual alliance performance and RACAP to individual alliance incremental innovation from *significant to non-significant*, establishing full mediation for the new construct (Chin, 2010). Thus, we find partial support for H6b and H7b. In regards to radical innovation, the relationship between alliance trust and individual alliance radical innovation is insignificant, suggesting only a direct effect between RACAP and individual alliance radical innovation, therefore rejecting H8b.

TABLE XVII: THREE MODEL COMPARISON

	Base Model	Trust, Firm Performance	Trust, All Performance
KNC --> PACAP	0.6483***	0.6483***	0.6483***
	0.0486	*0.0518*	*0.0498*
KNC --> RACAP	0.4504***	0.4509***	0.4509***
	0.064	*0.0614*	*0.0636*
PACAP --> RACAP	0.4533***	0.4527***	0.4527***
	0.0639	*0.0617*	*0.0654*
RACAP --> PORTPERF	0.32***	0.1643**	0.1643***
	0.0589	*0.0494*	*0.0469*
RACAP --> PORTINCREMENTAL	0.1986**	0.1513**	0.1513**
	0.0631	*0.0597*	*0.061*
RACAP --> PORTRADICAL	0.2019**	0.1626**	0.1626**
	0.0656	*0.0688*	*0.0682*
RACAP --> SAPERF	0.1234*	0.1238*	0.0145
	0.0657	*0.068*	*0.0607*
RACAP --> SAINCREMENTAL	0.1521**	0.1523**	0.095
	0.0613	*0.061*	*0.0674*
RACAP --> SARADICAL	0.239***	0.2396**	0.2051**
	0.0721	*0.0726*	*0.0757*
PORTINCREMENTAL --> PORTPERF	0.1926**	0.0403	0.0403
	0.0657	*0.0538*	*0.0554*
PORTRADICAL --> PORTPERF	0.3311***	0.2174***	0.2174***
	0.0697	*0.0576*	*0.0569*
SAINCREMENTAL --> PORTINCREMENTAL	0.5857***	0.5669***	0.5669***
	0.0717	*0.068*	*0.0678*
SAINCREMENTAL --> SAPERF	0.3115***	0.3114***	0.2713***
	0.0726	*0.0712*	*0.075*
SARADICAL --> PORTRADICAL	0.5472***	0.5376***	0.5376***
	0.0579	*0.0583*	*0.0634*
SARADICAL --> PORTPERF	0.264***	0.2638***	0.2457**
	0.0738	*0.0725*	*0.0752*
SAPERF --> PORTPERF		0.1950**	0.1950**
		0.0642	*0.0620*
RACAP --> TRUST		0.3702***	0.3702***
		.0644	*0.0639*

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; standard error terms are shown in italics.

TABLE XVII: THREE MODEL COMPARISON (CONTINUED)

	Base Model	Trust, Firm Performance	Trust, All Performance
TRUST --> PORTPERF		0.5158***	0.5158***
		0.0600	*0.0608*
TRUST --> PORTINCREMENTAL		0.1361**	0.1361**
		0.0593	*0.0619*
TRUST --> PORTRADICAL		0.1115*	0.1115*
		0.067	*0.0655*
TRUST --> SAINCREMEMENTAL			0.155*
			0.0823
TRUST --> SAOVERALL			0.3234***
			0.0789
TRUST --> SARADICAL			0.0933
			0.0769
Explained Variance: R^2			
PORTPERF	.393	.681	.681
PORTINCREMENTAL	.418	.434	.434
PORTRADICAL	.393	.403	.403
SAPERF	.252	.252	.340
SAINCREMENTAL	.023	.023	.044
SARADICAL	.057	.057	.065

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; standard error terms are shown in italics.

2. Post Hoc Analysis

There are several areas within the data that inspired some additional testing beyond our formal hypothesis. First, to better examine the relationship between micro and macro performance measures, two models were compared to interpret possible mediation effects. Second, the impact of two separate demographic variables, firm revenue and partner contribution, on the model was warranted.

a. Mediation Test: Micro-Level Performance

This research included both micro and macro level measures of performance in order to adhere to relationships as prescribed by theory in addition to addressing a specific need in the literature. The model supports the belief that micro-level performance mediates macro-level performance (Abell, Felin, & Foss, 2008; Foss et al., 2010), and thus relationships between individual-level and portfolio-level performance measures were assumed. To confirm the accuracy of these assumptions, I compared a model in which the micro-macro relationship was not included to the research model used as the basis for our hypothesis testing. Results indicate that micro measures of performance partially mediate macro measures of performance. Most interestingly, alliance-level incremental innovation was found to partially mediate the relationship between RACAP and portfolio-level incremental innovation, and alliance-level radical innovation was found to partially mediate the relationship between RACAP and portfolio-level radical innovation. The two models also indicate alliance-level performance partially mediates the relationship between trust and portfolio-level performance, alliance-level incremental innovation partially mediates the relationship between trust and portfolio-level incremental innovation and that alliance-level radical innovation partially mediates the relationship between trust and portfolio-level radical innovation. Model details can be found in TABLE XXIII, APPENDIX F.

b. Multigroup Moderation Test: Partner Contribution

Analysis of the data indicated that R^2 values for both incremental and radical innovation at the alliance level were consistently weak (below 0.19). As the R^2, or coefficient of determination, measures the amount of variation accounted for by the endogenous variables in the structural model, these low R^2 values suggest that the constructs are not very well explained by RACAP and TRUST. This finding was an interesting one, and inspired some additional analysis.

At the alliance level, each alliance can be categorized by the type of activities provided by the partner. We asked whether or not the partner contributed a specific type of activity, and then later asked respondents to rank those activities based on strategic importance. TABLE VII, earlier in this chapter, provided the data on the activities that were most often ranked at high levels of importance (#1 or #2). In our sample, technology and sales activities dominated the partner contributions, although a variety of activities were well represented. It seems logical to assume that different partner relationships would yield different outcomes, in addition to the obvious fact that not all alliances exist for the purpose of innovative outcomes. Thus, we further examined our data based on the contribution-type of the partner (see TABLE XXIV, APPENDIX F). Interestingly, we found a significant and substantial increase in R^2 for radical innovation at the alliance level (SARADICAL) when the partner was contributing either marketing or sales activities to the alliance. Thus, when a partner contributes marketing and/or sales activities to an alliance, RACAP and TRUST explain more variance in that alliances radical innovation. We do not see this same effect on incremental innovation. Additionally, in both these circumstances the path increase lies primarily between RACAP and SARADICAL, not in the relationship between TRUST and SARADICAL. This suggests that a firm's realized absorptive capacity has differential relationships on the radical innovation of an alliance, based on the type of role the partners play. In this specific case, when a firm relies on its partner for marketing and/or sales expertise, its own ability to transform and exploit knowledge becomes increasingly important. This interesting finding also suggests that despite the low R^2 found in this particular study, that the relationship between RACAP and innovation is an important one and deserves continued study.

F. Summary

In conclusion, the majority of our hypothesis in this study were supported. A complete recap of hypothesis and associated findings can be found in TABLE XVIII. In regards to the rejection of H8b, in which the relationship between alliance trust and alliance-level radical innovation is insignificant,

previous research might offer some insight. Bunduchi (2013) found that the reliance on trust led to an emphasis on incremental vs. radical innovation in collaborative relationships. This may be due to several factors. First, firms may choose to work with a trusted partner instead of exploring other relationships, losing out on the opportunity that a new partner may bring. Second, high levels of trust can indicate cohesion instead of out-of-the-box thinking. An overemphasis on trusted relationships can lead to inward-looking and a reduction in experimentation, both of which hamper in radical innovation.

TABLE XVIII: HYPOTHESIS FINDINGS SUMMARY

H1a	Knowledge network capability is an antecedent to potential absorptive capacity	*supported*
H1b	Knowledge network capability is an antecedent to realized absorptive capacity	*supported*
H2	Potential absorptive capacity is positively associated with realized absorptive capacity	*supported*
H3a	Realized absorptive capacity is positively associated with alliance portfolio performance	*supported*
H3b	Realized absorptive capacity is positively associated with individual alliance performance	*supported*
H4a	Realized absorptive capacity is positively associated with alliance portfolio incremental innovation	*supported*
H4b	Realized absorptive capacity is positively associated with individual alliance incremental innovation	*supported*
H5a	Realized absorptive capacity is positively associated with alliance portfolio radical innovation	*supported*
H5b	Realized absorptive capacity is positvely associated with individual alliance radical innovation	*supported*
H6a	Alliance trust partially mediates the relationship between realized absorptive capacity and alliance portfolio performance	*supported*
H6b	Alliance trust partially mediates the relationship between realized absorptive capacity and individual alliance performance	*partially supported*
H7a	Alliance trust partially mediates the relationship between realized absorptive capacity and alliance portfolio incremental innovation	*supported*
H7b	Alliance trust partially mediates the relationship between realized absorptive capacity and individual alliance incremental innovation	*partially supported*
H8a	Alliance trust partially mediates the relationship between realized absorptive capacity and alliance portfolio radical innovation	*supported*
H8b	Alliance trust partially mediates the relationship between realized absorptive capacity and individual alliance radical innovation	*unsuported*

V. SUMMARY

A. Introduction

The purpose of this study was to better understand the role of knowledge-based capabilities in the performance of interorganizational collaborations. This chapter presents the implications of this study in addition to limitations and future research directions. First, general contributions will be presented and then implications for both management and theory will be discussed. The chapter will conclude with discussion of study limitations and future research directions.

B. Findings and Core Contributions

This study contributes to the literature linking knowledge capabilities, inter-organizational collaboration and innovation provides a framework for understanding several different knowledge capabilities, how these capabilities relate to one another, and how they may be harnessed for competitive advantage. A focal contribution of this dissertation is the integration of different streams of theories from past research. I offer new insight into capability based inter-organizational collaboration firm by linking the independent yet complementary perspectives of the knowledge-based view of the firm (KBV) and dynamic capabilities theory (DC) together with transactive memory theory (TM).

The extant literature that relates knowledge capabilities to alliance outcomes is relatively inadequate. Early streams of research into knowledge capabilities were limited in scope and demonstrated measurement issues. As the field grew, much of the research focused narrowly on learning outcomes as the result of the collaboration process. This research complements, and extends, prior studies by examining a wider scope of capabilities in addition to associating these knowledge capabilities with higher-level performance outcomes. Approaching knowledge management as a capability from the perspective of the organization, this research has demonstrated the applicability of a capabilities framework in explaining the performance of interorganizational collaborations.

Of eight key hypothesis, seven received full or partial support. A synopsis of these hypotheses and their results is provided in TABLE XIX, APPENDIX B.

This research extends prior research on knowledge-based capabilities through the addition of an additional capability, which I term 'knowledge network capability' and extends prior research on value creation in strategic alliance research by looking at alliance satisfaction and innovative outcomes at both the level of the portfolio and the individual alliance. By analyzing the value creation of alliances in view of the firm's capability to manage its knowledge network, the importance of the human and social element in knowledge processes is stressed. Findings indicate that the two dimensions of absorptive capacity, PACAP and RACAP are closely related to the new construct. I provide evidence that alliance trust mediates the relationship between RACAP and various performance outcomes of interorganizational relationships. The results suggest that a firm's knowledge capabilities (specifically, knowledge network, potential and realized absorptive capacity) positively influence the success of interorganizational relationships. RACAP has a strong positive impact on the perceived success and innovative outcomes of both the individual alliance and the firm's portfolio of alliances. KNC and PACAP have a positive impact on collaborative success through their impact on the mediator, RACAP. Results reported that RACAP promotes alliance performance directly, and mediates the relationship between knowledge acquisition capability (PACAP) and knowledge networking capability (KNC). In other words, knowledge acquisition capability and knowledge networking capability are important preconditions of realized absorptive capacity and contribute to alliance performance indirectly.

In addition to testing the hypothesis, additional post-hoc testing provides some important insight. First, the analysis of an additional model confirmed the assumption that individual alliance performance mediates the performance of the firm's entire alliance portfolio. This supports the belief that micro-level performance mediates macro-level performance (Abell, Felin, & Foss, 2008; Foss et al., 2010), suggesting the importance of multi-level perspectives in alliance research. Second, I found that the relationship(s)

between knowledge capabilities and alliance performance differed by what role a firm's alliance partner played in the collaboration. This suggests that while knowledge capabilities are firm-level dynamic capabilities, these capabilities are implemented differently based on the alliance relationship. While a firm must possess all knowledge capabilities, it cannot simply maximize each capability in order to assure desired performance outcomes. As different relationships and scenarios require different combinations and level of capability, research in the knowledge capability – performance area becomes key in understanding and eliciting value creation.

In conclusion, at a high-level the study findings suggest that the combined effect of the internal knowledge based capabilities and relational trust have differential effects on radical and incremental innovation and perceived alliance success. These findings provide several important and interesting implications for both theory and practice.

C. Theoretical Implications

This study attempts to expand extant literature in strategic alliances, knowledge management and innovation by making several contributions. First, a focal contribution of this dissertation is to offer new insight into capability based inter-organizational collaboration by linking the independent yet complementary perspectives of the knowledge-based view (KBV) of the firm and dynamic capabilities (DC) theory together with transactive memory (TM) theory. This research represents one of the first to apply TM theory to investigate knowledge-based capabilities and their impacts on alliance performance. This study confirms that knowledge networking capability, potential absorptive capacity and realized absorptive capacity are three distinct but related components that form the overall KM capability of the firm. The research model stresses the importance of these three KM processes as dynamic capabilities, and investigates their interrelationships in addition to the role of relational factors, as they pertain to alliance performance.

The findings are consistent with the knowledge-based view of the firm (Grant, 1996a) which emphasizes the role of knowledge in innovation development and organizational performance. Specifically, this research provided empirical support to the notion that internal knowledge-based capabilities serve as key inputs for generating innovations through interorganizational collaborations. In addition, this study enriches the KBV through the examination of the differential effects of realized absorptive capacity on radical and incremental innovation development, and extends prior work by integrating both absorptive capacity and transactive memory concepts into the same framework.

The conceptualization of three specific knowledge-based capabilities and theorization of the relationship between these knowledge capabilities and the performance of interorganizational collaborations serves to extend previous research on dynamic capabilities. The proposed set of knowledge-based dynamic capabilities is linked to collaborative outcomes including innovation and alliance performance. This study validates the role of knowledge-based dynamic capabilities on innovation generation and the overall success of a firm's alliances, enhancing our understanding of dynamic capabilities and its link with innovation performance in collaborative environments. The empirical evidence supporting dynamic capabilities lies at the very core of the framework. The benefits of a dynamic knowledge capability stem from the interdependencies between the capabilities, as the imitation of a single capacity often fails to adequately capture its true value.

This dissertation also extends the role that social and network relationships play in the current alliance and marketing strategy literature. Currently, while some theoretical discussion exists, these areas are rarely empirically tested. This research is the first to address transactive memory as a knowledge based capability and aims to shift the predominant focus from acquisition-oriented knowledge capabilities to a more comprehensive outlook that involves the capability to recognize, allocate and retrieve knowledge within a network, acquire needed knowledge, and apply that knowledge to create value. By extending the way transactive memory is currently conceptualized, I provide empirical support for the theory in addition

to opening up other possible applications of the construct. Offering a new perspective, I apply TM theory in considering knowledge networking capability as an antecedent of absorptive capacity, ultimately influencing the successful acquisition and application of knowledge. Understanding the relationship between these capabilities is important in organizational contexts as it allows for opportunities to improve the management of knowledge both within and between organizations to take advantage of value creating opportunities.

D. Managerial Implications

Managing and utilizing knowledge within and across organizational boundaries is a major challenge for today's executives. This study demonstrates the importance of developing sufficient internal knowledge capabilities in order to achieve the desired outcomes from interorganizational collaborations. To remain competitive today, firms must implement dynamic capabilities that facilitate a variety of KM activities. An important concern of management is how to develop, maintain and exploit such capabilities in order to improve organizational competitiveness. This research can be summarized into three key criteria alliance managers should be aware of as they pursue a capability driven approach to interorganizational innovation.

1. *Managers should seek to foster a culture that stresses the exchange, transfer and creation of knowledge both within and across organizational boundaries*. Organizational culture has been deemed one of the most significant facilitators (and inhibitors) of effective KM. Kayworth and Leidner (2004) suggest that "the fundamental managerial role in knowledge management initiatives is to foster the underlying cultures to support these initiatives." Culture must create the right conditions for the development of knowledge, guiding the creation and maintenance of the capabilities discussed in this study.

A culture of continuous learning that stresses the role of knowledge in corporate success, rewards the creation and use of knowledge, offers a flexible KM infrastructure and a continuous critical assessment of knowledge stock, processes and capabilities would promote the flow of information and facilitate knowledge creation. This culture should include a collaborative mindset among employees which facilitates a positive attitude towards partnering and external knowledge.

Additionally, the analysis of the model developed in this study found support for the proposition that relational factors (specifically trust) have a significant impact on the capability-performance relationship. The existence of relational trust facilitates knowledge sharing and learning processes (Dyer & Singh, 1998). Managers can begin to build relational trust through a foundation of organizational trust, as an organizational culture that promotes and rewards trustworthiness and in which individuals work in an environment where they trust one another establishes a higher propensity to trust alliance partners (Bierly III & Gallagher, 2007). Thus, in order to enhance value creation from their collaborations, managers should seek to create organizational cultures that stress the role of knowledge, promote trust and trustworthiness, and embrace a partnering mindset and openness to external knowledge.

2. *Managers should also implement a holistic approach towards KM capabilities composed of the three areas of this study: knowledge networking (KNC), knowledge acquisition (PACAP) and knowledge application (RACAP).* This research demonstrates that the capabilities are complementary and should not be considered in isolation. An overemphasis (or neglect) on one factor can lead to inefficiency and other negative consequences. The development knowledge-based dynamic capabilities a strategic decision that is not without cost (Cui et al., 2005; Teece et al., 1997). Thus, managers should not seek to maximize all capabilities, but rather to maximize their complementary nature. This suggests two distinct steps. First, a firm must develop the appropriate capabilities to facilitate their knowledge

management processes. Second, the firm must build the dynamic capability to continually reconfigure and realign those knowledge management capabilities in order to adapt to the environment.

While managers cannot directly intervene on the level of capabilities, they can *influence* capabilities. This may require a changes in both organizational structure and culture. Managers play a crucial role in the development and reconfiguration of the resources, skills and processes needed for a firm to operate in the given environment (Teece, Pisano, & Shuen, 1997). This may be done, for example, by hiring employees with desired characteristics or by creating conditions that favor the accumulation of certain kinds of human capital (Foss, 2011). Organizational and project staffing are key aspects of capability development. For example, a manager may try to influence KNC by seeking employees with human skills that equate to transactive memory, such as an understanding of their own and others expertise and proficiency in communicating both within and outside of the organization. When staffing a collaborative project, managers should not only seek individuals with the right disciplinary skills for the project, but also those who possess complementary soft skills such as interpersonal communication, critical thinking ability and persistence. The right mix of all of these skills should also be balanced across the project.

3. *A firm and its managers must adopt a long-term strategy to build and maintain network ties in order to assemble resources, acquire new knowledge and realize opportunities*. A knowledge network capability is developed over time, as it requires familiarity with people and their specific knowledge resources and expertise. A firm must focus on the entire network – interfirm and intrafirm – as different configurations of the two networks yield different outcomes (Walter, Lechner, & Kellermanns, 2007).

Cultivating these networks can be challenging due to their organic nature. However, managers can take steps to facilitate and strengthen the knowledge network. For example, Wenger, McDermott, and Snyder (2002) offer seven suggestions to help foster a knowledge network. These steps include:

designing for evolution, opening internal and external dialogue, allowing different levels of participation, orchestrating public and private activities, focusing on value, providing both routine and novel events and experiences, and finding/creating the right rhythm. As the firm develops and builds its knowledge networking capability, it then has the potential to create more new knowledge as an outgrowth of the interconnection between existing and new knowledge (Seufert, Von Krogh, & Bach, 1999).

The firm's network strategy also returns us to our first point, organizational culture. The culture that fosters the creation, growth and maintenance of knowledge-based capabilities is one that fosters collaboration and the openness to external knowledge. This same culture simultaneously embraces the value of collaborative learning and the importance of the network that connects people both inside and outside the organization. To build this culture, organizations cannot ignore fact that collaboration simply cannot work without trust. Firms must do more than acknowledge the importance of trust; managers need to address trust as a long-term organizational philosophy. While a manager cannot be solely responsible for creating an environment of trust within the organization or its' collaborative relationships, their words and actions set the tone and contribute to the necessary foundation in building desired cultural elements.

E. Limitations and Future Research

1. Limitations of the Present Study

Although this research presents strong evidence regarding the impact of KM capabilities on alliance performance, the results should be interpreted in light of the study's limitations. First, the study design used a single informant to collect cross-sectional data. There are several possible consequences to the utilization of this method. I adopted the 'key informant' approach to collect the data as the key informants are expected to have knowledge about alliance level capabilities and structure (Campbell,

1955). It was assumed that respondent's judgments regarding KM capabilities, relational factors and performance were objective. However, the single informant method can suffer from potential response bias, including the over-reporting or under-reporting of certain phenomena (Bagozzi, Yi, & Phillips, 1991). This study was cross-sectional, with all variables measured at one point in time. This method creates a limitation due to the inherent nature of many of the constructs. Absorptive capacity, knowledge network capability and relational capital (trust) all require time to develop. A longitudinal research design is deemed a more powerful tool for further exploring the dynamic nature of these processes and factors. However, many alliances are often temporal in nature suggesting a longitudinal study to be difficult to conduct. Additionally, although the model was founded on previous research and existing theory and the structural equation method was employed, the cross-sectional nature of the data requires the interpretation of the causality between the constructs be treated with caution (Rindfleisch, Malter, Ganesan, & Moorman, 2008).

The main focus of the research has been studying the impact of knowledge capabilities and relational factors on alliance performance. The adjusted R^2 of the tested model (see TABLE XV) indicates that only part of the variation present in the data was explained here. Post hoc analyses were conducted to further investigate unexplained variance, however, it is clear that important variables that explain alliance performance are absent from the model. It is acknowledged that this could represent a limitation, but at one of the first studies to study both an extended set of knowledge capabilities in addition to multiple levels of performance, the narrow focus was deemed appropriate.

2. Directions for Future Research

Future research should seek to address the limitations outlined above: the use of key-informants and cross-sectional data and the exclusion of important variables.

The key informant approach is consistent with previous research into interorganizational relationships and is considered suitable when the respondents own unique insights and are deemed knowledgeable about the topic(s) at hand (Kumar, Stern, & Anderson, 1993). Although the use of single informants remains the primary research design in most studies, multiple informants would enhance the validity of the research findings. In order to examine the dynamic nature of constructs and the causality of the relationships, future research should use longitudinal studies. Thus, a longitudinal, multiple-respondent study would provide a stronger basis to investigate the hypothesized effects.

In regards to the model, this framework does not leave room for many of the possible external moderating factors. This research focused on organizational-level factors that influenced various collaborative factors, yet organizational factors are not the only influencers of dynamic processes. At an individual level, factors such as personal traits of employees may make them more or less willing to collaborate. Foss (2009) specifically suggested the importance of researching how the actions and interactions of individual mediates the effects of capabilities on firm level outcomes. This study captures data at the alliance and portfolio level; adding the individual level to the framework could capture interesting insight. At the level of the alliance, outcomes are likely influenced by factors that support or hinder the ability of a firm to gain access to external knowledge (Walter et al., 2007) such as the network position (Gulati, 1998) or alliance governance (Zollo et al., 2002). Environmental factors, such as technology and market uncertainty, may also effect knowledge management practices and is another promising area of future research (Meier, 2011). Future studies should also look at the variance in performance, levels and configurations of the capabilities (Cui & Kumar, 2013) and the feedback mechanisms that exist between these mircro and macro levels of analysis.

Apart from overcoming these limitations, for future research to advance the literature it is suggested that: the link between strategy and exploration be explored, knowledge capabilities receive more in-depth research both individually and collectively and that the role of technology in facilitating the capabilities should be taken into account.

Strategy is one of, if not the, most important contexts for guiding knowledge management (Zack, 2002). A firm allocates resources to particular capabilities as directed by its own strategic goals. Better performance and competitive advantage can be the byproduct of the effective alignment between firm strategy and capability development (Chesbrough, 2007; Teece, 2007; Wang & Ahmed, 2007). Casselman & Samson (2007) note that together the perspectives of knowledge strategy and knowledge capability provide a "reasonably complete model of the knowledge-based view of the firm." The link between strategy, capability and performance is well grounded in the traditional strategy literature but has been slightly less explored using the knowledge-based view of the firm. Research has specifically addressed a need to better understand how knowledge strategies affect how (and to what degree) partners in an alliance collaborate (Meier, 2011; Wang & Ahmed, 2007) and investigate the possibility of a link between firm performance and certain combinations of knowledge strategy and knowledge capabilities (Casselman & Samson, 2007).

Future research should also investigate each of the individual knowledge capabilities included in this model in more detail. The construct of knowledge networking capability specifically calls for more examination and verification. While the conceptualization and operationalization in this paper provides a starting point for future empirical studies, much work needs to be done to yield a mature construct. In addition to in-depth understandings of the individual capabilities, it would be interesting to further study the relationships between the capabilities. For example, determining if there are optimal combinations of different knowledge capabilities and what external factors effect that optimization would enable managers

to develop a proactive approach for designing their KM. The application of the ambidexterity hypothesis (Gibson & Birkinshaw, 2004; Rothaermel & Alexandre, 2009; Tushman, Reilly, & Charles III, 1996).

Many organizations use a wide variety of information technologies to support their knowledge management practices (Alavi & Leidner, 2001). The topics of knowledge stock, knowledge process and knowledge management are often complemented by the discussion of information technology. However, the study of information technology and KM initiatives is fragmented (Adamides & Karacapilidis, 2006; Cepeda-Carrion et al., 2012). More research is needed to better understand how different technology tools can be used to complement the development and application of various different knowledge processes and capabilities. Specifically, what role does information technology play in the process-based view in which the management of knowledge is viewed as a capability? How does IT facilitate the interactive and spontaneous knowledge flows driven by social relationships and human interaction that we find dominate collaborative innovation? An interesting area of research may be that of recent innovations in the area of social computing (i.e. tagging or "social bookmarking"). In contrast to the application of IT in regards to mechanistic memory, social applications of technology can be used to map the location of knowledge, provide a platform for communication between people in multiple locations, and facilitate decision making and negotiation. Investigating the role of IT as it relates to each knowledge capability, in addition to how IT functions under the dynamic nature of the capabilities, is an important area of inquiry for both theory and practice.

APPENDICIES

APPENDIX A: FULL MODEL

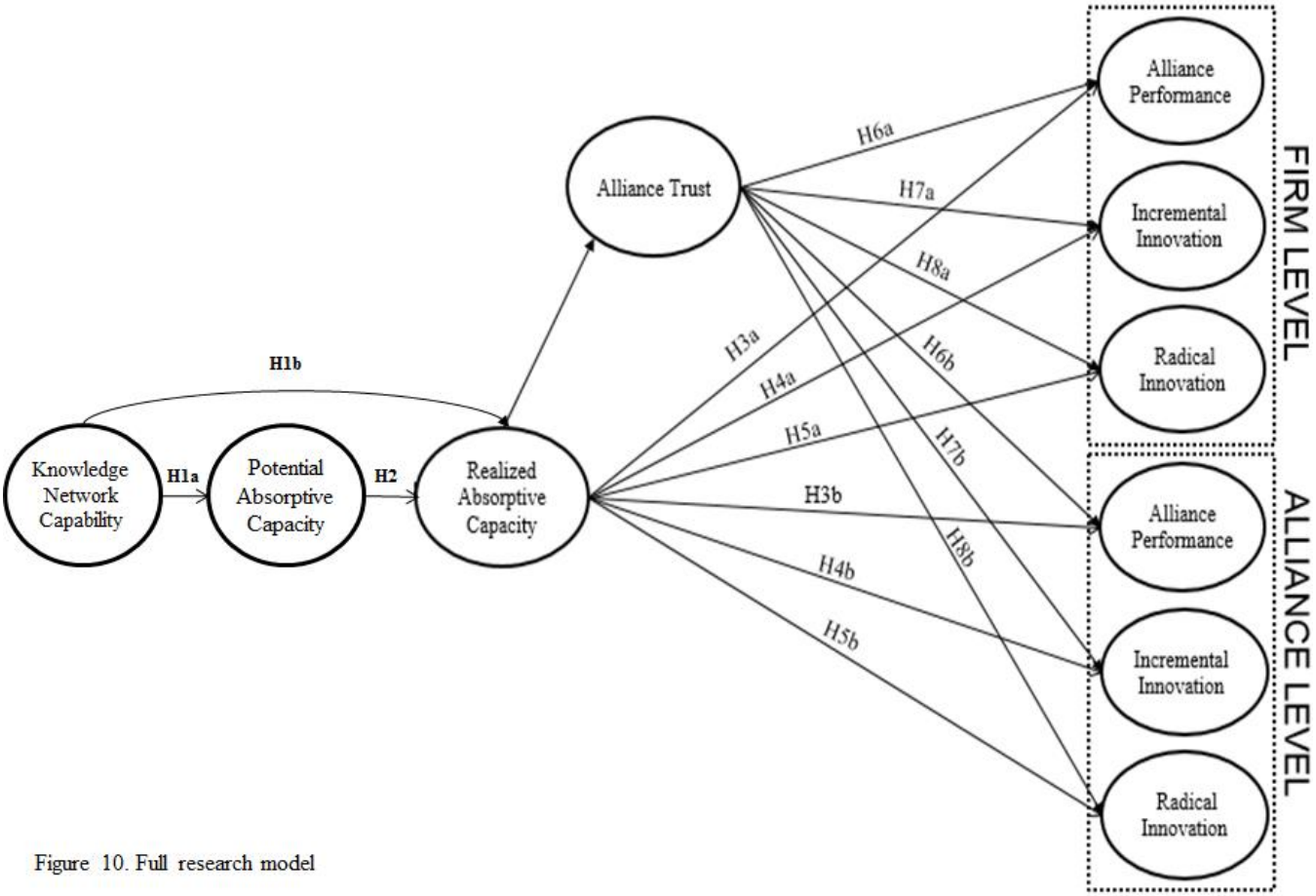


Figure 10. Full research model

APPENDIX B: HYPOTHESIS SUMMARY

TABLE XIX: SUMMARY RESULTS OF STUDY

Hypothesis	Paths	Estimates	Result
H1a: Knowledge network capability antecedes potential absorptive capacity	KNC-->PACAP	0.65***	Supported
H1b: Knowledge network capability antecedes realized absorptive capacity	KNC-->RACAP	0.45***	Supported
H2: Potential absorptive capacity antecedes realized absorptive capacity	PACAP-->RACAP	0.45***	Supported
H3a: Positive relationship between realized absorptive capacity and portfolio performance	RACAP-->PORTPERF	0.49***	Supported
H3b: Positive relationship between realized absorptive capacity and alliance perormance	RABCAP-->SAPERF	0.23**	Supported
H4a: Positive relationship between realized absorptive capacity and portfolio incremental innovation	RACAP-->PORTINCREMENTAL	0.29***	Supported
H4b: Positive relationship between realized absorptive capacity and alliance incremental innovation	RACAP-->SAINCREMENTAL	0.15**	Supported
H5a: Positive relationship between realized absorptive capacity and portfolio radical innovation	RACAP-->PORTRADICAL	0.33***	Supported
H5b: Positive relationship between realized absorptive capacity and alliance radical innovation	RACAP-->SARADICAL	0.24***	Supported
H6a: Alliance trust partially mediates realized absorptive capacity and portfolio performance	RACAP-->PORTPERF TRUST-->PORTPERF	.16*** .052***	Supported
H6b: Alliance trust partially mediates realized absorptive capacity and alliance performance	RABCAP --> SAPERF TRUST-->SAPERF	0.01 0.32***	Partial Support
H7a: Alliance trust partially mediates realized absorptive capacity and portfolio incremental innovation	RACAP-->PORTINCREMENTAL TRUST-->PORTINCREMENTAL	0.15** .14**	Supported
H7b: Alliance trust partially mediates realized absorptive capacity and alliance incremental innovation	RACAP-->SAINCREMENTAL TRUST-->SAINCREMENTAL	0.10 0.16*	Partial Support
H8a: Alliance trust partially mediates realized absorptive capacity and portfolio radical innovation	RACAP-->PORTRADICAL TRUST-->PORTRADICAL	0.16** 0.11*	Supported
H8b: Alliance trust partially mediates realized absorptive capacity and alliance radical innovation	RABCAP-->SARADICAL TRUST-->SARADICAL	0.21** 0.09	No Support

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

APPENDIX C: OVERVIEW OF EXPLORATORY INTERVIEWS

TABLE XX: LIST OF EXPLORATORY INTERVIEWS

Title	Industry*	Interview Date	Interview Duration
Specialist Leader	Professional/Scientific/Tech Services	1/30/13	64:12
Global Alliance Director	Information	1/31/13	38:36
Director, Partnership Management and Bus Dev	Manufacturing	2/4/13	51:40
Sr. Director, Strategic Account & Partner Mgmt	Manufacturing	2/7/13	20:00
Alliance Director	Information	2/7/13	58:57
Vice President of Product Management	Professional/Scientific/Tech Services	2/6/13	41:48
Senior Director, Alliances & Partnerships	Information	2/11/13	60:00
VP, Strategic Alliances	Manufacturing	2/13/13	60:00
Strategic Alliance Director	Manufacturing	2/14/13	78:09
Global Alliance Manager, Strategic Alliances	Information	2/19/13	64:00
Vice President of Product Development	Information	2/20/13	67:20
Director, Partner Alliances	Manufacturing	3/1/13	84:09
Director of Business Development	Professional/Scientific/Tech Services	3/13/13	44:13

** by 2 digit NAICS*

APPENDIX C: OVERVIEW OF EXPLORATORY INTERVIEWS (continued)

The script for the interviews was primarily intended to better understand the role of knowledge and knowledge capabilities in interorganizational collaborations, and was guided by the following questions:

TABLE XXI: INTERVIEW SCRIPT

1	What is your primary function in the organization
2	Describe your specific involvement in alliances & the projects your firms manages with alliance partners
3	What are the primary reasons your firm engages in alliances?
4	From your perspective as (INSERT ROLE), what challenges of working in a collaborative environment has your organizations struggled with most? How would you address these if you could?
5	How do alliances improve your firms competitive advantage? Technology? Resources? Skills? Market clout? Market positioning? Other?
6	Is your firm satisfied with the performance of your alliances?
7	Can you describe your strategy creation process?
8	What is the goal of KM in your organization? How does that pertain to alliances?
9	How to the knowledge needs of the firm influence the creation of knowledge management processes and systems?
10	How do the knowledge needs/assets of the firm influence the creation of business strategy? (vice versa?)
11	What factors influence the decision on whether to produce new knowledge in-house (training, hiring new employees) or source knowledge externally?
12	Please tell me whether your or agree or disagree with the following statement: "In our organization we view alliances as a means to learn about a particular technology/process held by the partner, rather than as a way to simply use or rent this know-how."
13	From the definition above, how familiar are you with the concepts and practices of "Alliance Strategy"?
14	Can you describe your role in your organizations alliance strategy? / Describe your strategy creation process

APPENDIX D: OPHRS APPROVAL

UNIVERSITY OF ILLINOIS
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 672)
203 Administrative Office Building
1737 West Polk Street
Chicago, Illinois 60612-7227

Exemption Granted

December 10, 2012

Dawn Schneider, MBA
Managerial Studies
3521 N Hoyne
M/C 243
Chicago, IL 60618
Phone: (773) 339-0102

RE: Research Protocol # 2012-1028
"A Capability View of Interorganizational Collaboration"

Sponsors: None

Dear Dawn Schneider:

Your Claim of Exemption was reviewed on December 6, 2012 and it was determined that your research protocol meets the criteria for exemption as defined in the U. S. Department of Health and Human Services Regulations for the Protection of Human Subjects [(45 CFR 46.101(b)]. You may now begin your research.

Exemption Period:	**December 6, 2012 – December 6, 2015**
Performance Site(s):	UIC
Subject Population:	Adult (18+ years) subjects only
Number of Subjects:	400

The specific exemption category under 45 CFR 46.101(b) is:
(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

You are reminded that investigators whose research involving human subjects is determined to be exempt from the federal regulations for the protection of human subjects still have responsibilities for the ethical conduct of the research under state law and UIC policy. Please be aware of the following UIC policies and responsibilities for investigators:

1. Amendments You are responsible for reporting any amendments to your research protocol that may affect the determination of the exemption and may result in your research no longer being eligible for the exemption that has been granted.

2. Record Keeping You are responsible for maintaining a copy all research related records in a secure location in the event future verification is necessary, at a minimum these documents include: the research protocol, the claim of exemption application, all questionnaires, survey instruments, interview questions and/or data collection instruments associated with this research protocol, recruiting or advertising materials, any consent forms or information sheets given to subjects, or any other pertinent documents.

3. Final Report When you have completed work on your research protocol, you should submit a final report to the Office for Protection of Research Subjects (OPRS).

4. Information for Human Subjects UIC Policy requires investigators to provide information about the research protocol to subjects and to obtain their permission prior to their participating in the research. The information about the research protocol should be presented to subjects in writing or orally from a written script. When appropriate, the following information must be provided to all research subjects participating in exempt studies:
   a. The researchers affiliation; UIC, JBVMAC or other institutions,
   b. The purpose of the research,
   c. The extent of the subject's involvement and an explanation of the procedures to be followed,
   d. Whether the information being collected will be used for any purposes other than the proposed research,
   e. A description of the procedures to protect the privacy of subjects and the confidentiality of the research information and data,
   f. Description of any reasonable foreseeable risks,
   g. Description of anticipated benefit,
   h. A statement that participation is voluntary and subjects can refuse to participate or can stop at any time,
   i. A statement that the researcher is available to answer any questions that the subject may have and which includes the name and phone number of the investigator(s).
   j. A statement that the UIC IRB/OPRS or JBVMAC Patient Advocate Office is available if there are questions about subject's rights, which includes the appropriate phone numbers.

Please be sure to:
→Use your research protocol number (listed above) on any documents or correspondence with the IRB concerning your research protocol.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact me at (312) 355-2908 or the OPRS office at (312) 996-1711. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

Charles W. Hoehne, B.S., C.I.P.
Assistant Director
Office for the Protection of Research Subjects

cc: Mark Shanley, Managerial Studies, M/C 243
Anna Shaojie Cui, Managerial Studies, M/C 243

APPENDIX E: SURVEY MEASURES

TABLE XXII: ABSORPTIVE CAPACITY SCALE MODIFICATIONS

	Jansen, van den Bosch and Volberda (2002) Original Items	Final Survey Items
Potential Absorptive Capacity		
Acquire1	Our unit has frequent interactions with corporate headquarters to acquire new knowledge.	We have frequent interactions with others in the industry to acquire new knowledge.
Acquire2	Employees of our unit regularly visit other branches.	Employees are engaged in cross-functional work.
Acquire3	We collect industry information through informal means (e.g. lunch with industry friends, talks with trade partners).	We collect information through informal means (e.g. lunch or social gatherings with customers and suppliers, trade partners and other stakeholders).
Acquire4	Other divisions of our company are hardly visited. ®	We are hardly in touch with other firms and stakeholders in the industry. ®
Acquire5	Our unit periodically organizes special meetings with customers or third parties to acquire new knowledge.	We organize special meetings with customers, suppliers, or third parties to acquire new knowledge.
Acquire6	Employees regularly approach third parties such as accountants, consultants, or tax consultants.	We regularly approach third parties outside the industry (such as professional organizations) to gather information
Assimiliate1	We are slow to recognize shifts in our market (e.g. competition, regulation, demography). ®	We are slow to recognize shifts in the environment (e.g. competition, regulation and demography) ®
Assimiliate2	New opportunities to serve our clients are quickly understood.	We are able to quickly identify new opportunities to meet our customer needs.
Assimiliate3	We quickly analyze and interpret changing market demands.	We quickly analyze and interpret changing market demands.

APPENDIX E: SURVEY MEASURES (continued)

TABLE XXII: ABSORPTIVE CAPACITY SCALE MODIFICATIONS (continued)

	Jansen, van den Bosch and Volberda (2002) Original Items	Final Survey Items
Realized Absorptive Capacity		
Transform1	Our unit regularly considers the consequences of changing market demands in terms of new products and services.	We regularly consider the consequences of changing market demands in terms of new products and services.
Transform2	Employees record and store newly acquired knowledge for future reference.	Employees record and store newly acquired knowledge for future reference.
Transform3	Our unit quickly recognizes the usefulness of new external knowledge to existing knowledge.	We quickly recognize the usefulness of new external knowledge to existing knowledge.
Transform4	Employees hardly share practical experiences. ®	Employees hardly share practical experiences with one another. ®
Transform5	We laboriously grasp the opportunities for our unit from new external knowledge. ®	Grasping the opportunities from new external knowledge is a laborious undertaking. ®
Transform6	Our unit periodically meets to discuss consequences of market trends and new product development.	We periodically meet to discuss consequences of market trends and new product development.
Apply1	It is clearly known how activities within our unit should be performed.	It is clearly known how activities within and between departments should be performed.
Apply2	Client complaints fall on deaf ears in our unit.®	Client complaints often fall on deaf ears. ®
Apply3	Our unit has a clear division of roles and responsibilities.	We have a clear division of roles and responsibilities.
Apply4	We constantly consider how to better exploit knowledge.	We constantly consider how to better exploit knowledge.
Apply5	Our unit has difficulty implementing new products and services. ®	We have difficulty implementing new products and new processes. ®
Apply6	Employees have a common language regarding our products and services.	Our employees have a common language regarding our products and services.

APPENDIX E: SURVEY MEASURES (continued)

Absorptive Capacity

Potential Absorptive Capacity (α = .73)

1 Employees are engaged in cross-functional work
2 We organize special meetings with customers, suppliers, or third parties to acquire new knowledge
3 We are slow to recognize shifts in the environment (e.g. competition, regulation and demography).
4 We are able to quickly identify new opportunities to meet our customer needs.

Realized Absorptive Capacity (α = .81)

1 We regularly consider the consequences of changing market demands in terms of new products and services.
2 We quickly recognize the usefulness of new external knowledge to existing knowledge.
3 We periodically meet to discuss consequences of market trends and new product development.
4 It is clearly known how activities within and between departments should be performed.
5 We constantly consider how to better exploit knowledge.
6 We have difficulty implementing new products and new processes.(R)

Knowledge Network Capability (α = .84)

1 We possess a good map of individual, group and partners' talents and skills.
2 We assign tasks to commensurate with task-relevant knowledge and skill.
3 Individuals know what task-related skills and knowledge they each possess.
4 When facing a task or obstacle outside of our expertise, we easily determine who would have the necessary information or skills to solve the task or surmount the obstacle.
5 When confronted with a task or problem in which we do not possess all the necessary expertise, we coordinate the retrieval of information from known "experts."
6 We consciously build ties with known "experts" in order gain actual access to that expert knowledge should a need arise.

Alliance Portfolio Performance (α = .83)

1 Our alliances are characterized by strong and harmonious relationships between partners.
2 The company has been successful in learning some critical skills and capabilities from its alliance partners.
3 Our company has achieved its primary objectives in forming alliances.
4 The company's competitive position has been greatly enhanced by alliances.

Individual Alliance Performance

1 Please evaluate the alliance along the following criteria: Overall Results

Radical Innovative Performance - Portfolio

1 When considering your entire portfolio of alliances, which of the following benefits did your cooperation with external partners bring to your company over the last five years: Creating completely new products and/or services

Incremental Innovative Performance - Portfolio

1 When considering your entire portfolio of alliances, which of the following benefits did your cooperation with external partners bring to your company over the last five years: Improving current products and/or services

Radical Innovative Performance - Individual

1 In terms of the alliance in question, which of the following benefits did your cooperation with this particular partner bring: Creating completely new products and/or services

Incremental Innovative Performance - Individual

1 In terms of the alliance in question, which of the following benefits did your cooperation with this particular partner bring: Improving current products and/or services

APPENDIX F: POST HOC ANALYSIS

TABLE XXIII: MICRO-MACRO MODEL RESULTS

	Micro Model	Micro-Macro Model
KNC --> PACAP	.6483***	0.6483***
	.0488	*0.0482*
KNC --> RACAP	.4509***	0.4509***
	.0642	*0.0630*
PACAP --> RACAP	.4527***	0.4527***
	.0658	*0.0614*
RACAP --> PORTPERF	.1622***	0.1643***
	.0480	*0.0486*
RACAP --> PORTINCREMENTAL	.2052**	0.1513**
	.0750	*0.0643*
RACAP --> PORTRADICAL	.2729***	0.1626**
	.0773	*0.0706*
RACAP --> SAPERF	.0145	0.0145
	.0634	*0.0636*
RACAP --> SAINCREMENTAL	.0950	0.0950
	.0636	*0.0658*
RACAP --> SARADICAL	.2051**	0.2051**
	.0756	*0.0769*
PORTINCREMENTAL --> PORTPERF	.0819	0.0403
	.0555	*0.0539*
PORTRADICAL --> PORTPERF	.2529***	0.2174***
	.0620	*0.0586*
SAINCREMENTAL --> SAPERF	.2713***	0.2713***
	.0745	*0.0751*
SARADICAL --> SAPERF	.2457***	0.2457**
	.0740	.0777
RACAP --> TRUST	.3702***	0.3702***
	.0641	*0.0638*

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; standard error terms are shown in italics.

APPENDIX F: POST HOC ANALYSIS (continued)

TABLE XXIII: MICRO-MACRO MODEL RESULTS (CONTINUED)

	Micro Model	Micro-Macro Model
TRUST --> PORTFPERF	.5793***	0.5158***
	.0559	.0607
TRUST --> PORTINCREMENTAL	.2240**	0.1361**
	.0832	.0614
TRUST --> PORTRADICAL	.1617**	0.1115*
	.0768	.0669
TRUST --> SAINCREMEMENTAL	.1550*	0.1550*
	.0863	.0835
TRUST --> SAOVERALL	.3234***	0.3234***
	.0801	.0757
TRUST --> SARADICAL	.0933	.0933
	.0760	.0758
SAPERF-->PORTPERF		.1950**
		.0635
SAINCREMENTAL --> PORTINCREMENTAL		0.5466***
		0.0770
SARADICAL --> PORTRADICAL		0.5176***
		0.0656
Explained Variance: R^2		
PORTPERF	.655	.681
PORTINCREMENTAL	.126	.434
PORTRADICAL	.133	.403
SAPERF	.340	.340
SAINCREMENTAL	.044	.044
SARADICAL	.065	.065

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; standard error terms are shown in italics.

APPENDIX F: POST HOC ANALYSIS (continued)

TABLE XXIV: MODEL RESULTS BY PARTNER CONTRIBUTION TYPE

	All Partners	Manufacturing	Marketing	Sales	Supply	Tech
KNC --> PACAP	0.6483***	0.6751***	0.6124***	0.6588***	0.6896***	0.6134***
KNC --> RACAP	0.4509***	0.3876***	0.6267***	0.5840***	0.4377***	0.4172***
PACAP --> RACAP	0.4527***	0.5286***	0.2942**	0.3847***	0.4825***	0.5173***
RACAP --> PORTPERF	0.1643***	0.1891***	0.1009	0.2025**	0.1430**	0.3671***
RACAP --> PORTINCREMENTAL	0.1513**	0.1285*	0.0996	0.0648	0.1401*	0.1983
RACAP --> PORTRADICAL	0.1626**	0.2196**	0.0608	0.1041	0.1939**	0.0941
RACAP --> SAPERF	0.0145	-0.0478	-0.0568	-0.0873	-0.0264	'-0.0460
RACAP --> SAINCREMENTAL	0.0950	0.1413*	-0.0048	-0.0393	0.0786	0.1017
RACAP --> SARADICAL	0.2051**	0.1568*	0.5416***	0.3960**	0.1636*	0.2844**
PORTINCREMENTAL --> PORTPERF	0.0403	0.0976	0.0299	0.0428	0.0564	'-0.0217
PORTRADICAL --> PORTPERF	0.2174***	0.1657**	0.3498**	0.2722**	0.2109**	0.1680**
SAPERF--> PORTPERF	0.1950**	0.2262**	0.2002	0.2020	0.2143**	0.3306**
SAINCREMENTAL --> PORTINCREMENTAL	0.5669***	0.5359***	0.6091***	0.7057***	0.4965***	0.4266**
SAINCREMENTAL --> SAPERF	0.2713***	0.3137***	0.1975*	0.2044*	0.3846***	0.4205**
SARADICAL --> PORTRADICAL	0.5376***	0.5482***	0.6067***	0.5689***	0.5064***	0.5524***
SARADICAL --> SAPERF	0.2457**	0.1856**	0.5591***	0.3689**	0.2198**	-0.0413
RACAP --> TRUST	0.3702***	0.4005***	0.4446***	0.3780***	0.3203***	0.3530**
TRUST --> PORTFPERF	0.5158***	0.4754***	0.4685***	0.4232**	0.4973***	0.3854***
TRUST --> PORTINCREMENTAL	0.1361**	0.1571**	0.0177	0.0965	0.1575**	0.1171
TRUST --> PORTRADICAL	0.1115*	0.0659	0.1195	0.1440	0.0352	0.1471
TRUST --> SAINCREMEMENTAL	0.1550*	0.1639*	0.1716	0.2656*	0.1612*	0.2047
TRUST --> SAOVERALL	0.3234***	0.4094***	0.2542**	0.3296**	0.3404***	0.3256**
TRUST --> SARADICAL	0.0933	0.1218	0.1067	0.1703	0.1315	0.0724
Explained Variance: R^2						
PORTFPERF	.681	.705	.739	.686	.634	.752
PORTINCREMENTAL	.434	.410	.395	.556	.352	.305
PORTRADICAL	.403	.427	.483	.474	.347	.406
SAPERF	.340	.407	.525	.404	.430	.315
SAINCREMENTAL	.044	.065	.029	.064	.040	.067
SARADICAL	.065	.055	.325	.237	.058	.101

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; standard error terms are shown in italics.

APPENDIX G: SURVEY INSTRUMENT

Intro

Dear Participant,

This survey is part of an ongoing research project to better understand how firms manage strategic alliances. Specifically, the objective here is to gain an in-depth understanding of the roles strategy and several distinct knowledge and communication processes have for alliance performance - both at the individual and portfolio level.

Benefits for You
In the final section you will have the opportunity to request a copy of the aggregate results of the survey. At this time, you will also have the opportunity to enter into a drawing for an Apple iPad *(note: iPad will be the most recent version available)*. The survey is designed to keep respondents strictly anonymous; the software does not assign your answers to your company or to you individually. Any contact information you provide is stored separate from your survey answers.

Procedure
Please answer the questions on this survey as completely as possible as each section of the survey is customized to your previous answers. Filling out this questionnaire should take about 20 minutes of your time. However, as the survey questions are based on your particular knowledge and expertise, it is possible some participants who indicate a large range of knowledge/expertise may find the survey to take a bit longer. Additionally, based on your responses, you may be asked to refer another member of your organization for some follow-up questions.

You may exit the survey at any time by simply closing your browser. Your input for each page will be saved automatically when you hit "next", and you can continue at any time by returning to the survey. (If you plan to exit the survey to return at a later time, you can use the link in your email or bookmark the page in your browser. When you return to the survey, you will resume where you left off.)

To continue to the next page, please press the "next" button below.

Yours sincerely,
Dawn Schneider, Ph.D. Candidate
University of Illinois at Chicago

The data collected in this survey will be strictly confidential. Your participation is voluntary and neither your name nor identifying information will be associated with any of your responses. You are free to not answer any questions you may find objectionable, and may withdraw from my study at any time, just by letting the researcher (Dawn Schneider: 773-339-0102 or dschne5@uic.edu) know you would not like to continue any further. If you feel you have not been treated according to these descriptions, or you have any questions about your rights as a research subject, you may call the University of Illinois at Chicago Office for the Protection of Research Subjects (OPRS) at 312-996-1711 (local) or 1-866-789-6215 (toll-free) or e-mail OPRS at uicirb@uic.edu.

Company Demo

To begin, we would like some background information on your company. The following questions include general demographic information in addition to more specific questions regarding your company's strategic alliance relationships.

In which country does your company primarily operate?

United States of America

How many total employees does your company have?

How long has your company been in business?

Number of Years

In which industry does your company primarily operate?

IT

Please indicate your primary NAICs code *(if available)*

What is your company's annual revenue

Please read the following definition:

Strategic alliances are voluntary inter-firm cooperative arrangements aimed at achieving the strategic objectives of the partners. For the questions in this survey, "strategic alliances" include a variety of arrangements, including (but not limited to) strategic supplier relationships, minority stakes, joint ventures, cross-licensing arrangements, joint marketing agreements and research consortia. However, the term "strategic alliance" excludes mergers, acquisitions, internal arrangements (i.e. between business units of one company), franchising, simple licensing and non-strategic supplier relationships.

Based on the definition provided, does your company currently have any strategic alliances?

○ Yes ○ No

How long has your company been active in agreements such as these?

○ 0-1 years
○ 2-4 years
○ 5-7 years
○ 8-10 years
○ Over 10 years

In total, how many strategic alliances has your company formed over the last 5 years?

- Under 5 alliances
- 5 - 15 alliances
- 16 - 25 alliances
- 26 - 40 alliances
- Over 40 alliances

Does your organization have a formal, dedicated program responsible for overseeing the company's alliances?

- Yes
- No

Company Mismatch - No Alliances

According to your previous answers, your company unfortunately does not meet the requirements for participating in this research. Please press 'next' to continue.

Org Culture & Environment

The following questions seek to better understand some aspects of your company's culture and the market your company operates in.

Please state whether you agree or disagree with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
There is a commonality of purpose in our organization.	○	○	○	○	○	○	○
We are not afraid to reflect critically on the shared assumptions we have made about our customers.	○	○	○	○	○	○	○
Learning in our organization is seen as a key commodity necessary to guarantee organizational survival.	○	○	○	○	○	○	○
The business practices in our industry are constantly changing.	○	○	○	○	○	○	○
We rarely collectively question our own bias about the way we interpret customer information.	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
The environmental demands on our company are constantly changing.	○	○	○	○	○	○	○
There is total agreement on our organizational vision across all levels, functions, and divisions.	○	○	○	○	○	○	○
The sense around here is that employee learning is an investment, not an expense.	○	○	○	○	○	○	○
Personnel in this company realize that the very way they perceive the marketplace must be continually questioned.	○	○	○	○	○	○	○
Employees view themselves as partners in charting the direction of the organization.	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
All employees are committed to the goals of this organization.	○	○	○	○	○	○	○
Managers basically agree that our organization's ability to learn is the key to our competitive advantage.	○	○	○	○	○	○	○
The basic values of our organization include learning as key to improvement.	○	○	○	○	○	○	○
We continually judge the quality of our decisions and activities taken over time.	○	○	○	○	○	○	○

Individual Role Questions

For the following questions, we would like to know more about your specific role in the organization, and how your role pertains to strategic alliances. ***(Please be sure to answer each question! Future questions within this survey are customized to your role and personal experience.)***

How long have you been working for this company?

Years

Months

How exactly would you describe your position within your company? (*Multiple answers are possible)*

- ☐ Company (Co-)Owner
- ☐ Company President / Director
- ☐ Chief Executive Officer
- ☐ Chief Financial Officer
- ☐ Vice President, Strategic Alliances
- ☐ Director, Strategic Alliances
- ☐ Manager, Strategic Alliance(s)
- ☐ Vice President, Business Development
- ☐ Director, Business Development
- ☐ Manager, Business Development
- ☐ Project Manager
- ☐ Other

How long have you been in this particular role?

Years

Months

How many direct reports do you currently have?

Do you play a role in overseeing and coordinating your company's overall alliance activity?
(E.g. aligning business and alliance strategy, coordinating relationships and interactions among and between various alliances, managing performance of entire alliance portfolio)

○ Yes ○ No

Do you bear direct responsibility in managing one or more specific strategic alliances within your organization?

○ Yes ○ No

Please identify the total number of alliances you currently manage.

Were you responsible for managing or leading a recently completed initiative (within the past 3 years) that involved key contributions from an alliance partner?
(Specific initiatives may include, but are not limited to: joint marketing, co-development, R&D collaboration, distribution pacts, sales agreements, or technology exchanges)

○ Yes ○ No

Are you currently member of the Association of Strategic Alliance Professionals (ASAP)?

○ Yes ○ No ○ Not Sure of Member Status

Block 5

According to your previous answers, your company fulfills the requirements for participating in the survey. However, as you yourself do not bear the responsibility for managing alliances or an alliance-based project within your company, you are kindly asked to forward this invitation to the person(s) within your company who act in this capacity.

Please forward this invitation to the individual(s) within your firm responsible for partner strategy and implementation and/or identifying, securing and managing partnerships. Your assistance is greatly appreciated!

Alliance Manager Role

The following questions are to obtain more information about your specific role in your company's strategic alliance activity.

An alliance strategy represents much more than one strategic alliance. Alliance strategy has four basic elements: 1) it shapes the logic and design of an alliance 2) it guides the management of an alliance 3) it enables coordination among and between a portfolio of alliances, and 4) it facilitates the organizational infrastructure that strives to maximize the value of external collaboration.

From the definition above, how familiar are you with the concepts and practices of "Alliance Strategy"?

Extremely Unfamiliar 1	Very Unfamiliar 2	Slightly Unfamiliar 3	Neither Familiar or Unfamiliar 4	Slightly Familiar 5	Very Familiar 6	Extremely Familiar 7
○	○	○	○	○	○	○

Please agree or disagree with the following statements:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
I play a principal role in partner strategy and implementation.	○	○	○	○	○	○	○
As part of my role, I cultivate, advance and leverage partner relationships across the organization.	○	○	○	○	○	○	○
I ensure that the strategic objectives of my company are being served by our alliances.	○	○	○	○	○	○	○
I am responsible for annual financial goals and/or other partnership objectives as defined by my organization.	○	○	○	○	○	○	○
We have a process for managing knowledge in inter-organizational relationships, but I am not specifically familiar with it.	○	○	○	○	○	○	○
I can speak to the specific processes and interactions that take place between my company and the alliance partner during the course of a project.	○	○	○	○	○	○	○

Project Manager Demos

You have indicated that, within the past three years, you managed or lead a project or initiative in which a strategic alliance partner offered key contributions.

Please describe this specific initiative to us in a few words:
(If you managed several key initiatives, please describe the one that was considered to be the most strategically important to your organization)

In order to help identify this initiative, without naming your company, please provide a brief title:

Alliance Demos

The following questions ask for details regarding the specific alliance you manage.

The following questions ask for details regarding a specific alliance and partner. As you manage multiple alliances, please select one specific alliance that is considered to be the most strategically important to your company. The alliance in question need not be currently active, but must have been active within the past *three years*. Keep the alliance you have selected in mind when answering the questions to follow.

For the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* initiative, please identify the completion date. If the initiative is still ongoing, please identify the most recent performance review date.

For the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* alliance, please identify the most recent date in which performance was reviewed.

Year
Month
Date

What was the duration of this initiative? *(number of months)*

For the following section, please think about the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* alliance. If multiple alliance partners were involved, please consider the partner that your organization views as the most strategically important.

For the following section, please think about the alliance and partner involved in the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* initiative. If multiple alliance partners were involved, please consider the partner that was the most strategically important to this particular initiative.

Which of the following best describes the partner? *(check all that apply)*

- ☐ Supplier
- ☐ Competitor
- ☐ Customer
- ☐ University
- ☐ Consultant
- ☐ Research Institute
- ☐ Non-Forprofit or Nongovernmental Organization
- ☐ Other

In which country does the partner primarily operate?

United States of America

In which industry does your partner primarily operate?

IT

Please indicate your partner's primary NAICs code *(if available)*

Which of the following best describes the strategic alliance agreement between your company and the partner in question?

○ Equity ○ Non-Equity

When did your company join this particular strategic alliance?

Is this particular alliance still active?

○ Yes ○ No

When was the alliance terminated?

Year
Month
Date

What specific activities did the partner contribute to the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* initiative? *(select all)*

In regards to the alliance in question, which of the following specific activities did the partner contribute?

	Did partner contribute the specified activity?	
	Yes	No
Technology	○	○
Sales	○	○
Marketing	○	○
Research	○	○
Development	○	○
Manufacturing	○	○
Supply	○	○
Channel and Distribution	○	○
Other	○	○

For the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* initiative, please rank the identified partner contributions according to strategic importance. Please rank each of the contributions, with a "1" being the contribution deemed most strategically important to the initiative. (Drag and drop the selections to rank)

Please rank the identified partner contributions according to strategic importance. Rank each of the contributions, with a "1" being the contribution deemed most strategically important to your company. (Drag and drop the selections to rank)

- Technology
- Sales
- Marketing
- Research
- Development
- Manufacturing
- Supply
- Channel and Distribution
- ${q://QID169%231/ChoiceTextEntryValue/8}

How many total unique initiatives has your company conducted with this partner? Please include both current and past initiatives, regardless of the content or purpose of the agreement or the perceived success or failure. *(Specific initiatives may include, but are not limited to: joint marketing, co-development, R&D collaboration, distribution pacts, sales agreements, or technology exchange)*

Alliance partner - project manager

Please indicate whether you agree or disagree with the following statements.

In involving this alliance partner in the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* initiative, our objectives were to:

Please indicate whether you agree or disagree with the following statements.

In forming an alliance with this particular partner, our objectives were to:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
Build or enhance our internal knowledge base.	○	○	○	○	○	○	○
Acquire skills or know-how from the partner.	○	○	○	○	○	○	○
Maximize the utilization of complementary assets between our firm and the partner firm.	○	○	○	○	○	○	○
Combine our existing specialized knowledge with that of our partner in order to create synergies.	○	○	○	○	○	○	○
Maintain our own resources and capabilities while relying on our partner to fill resource and/or capability gaps.	○	○	○	○	○	○	○
Learn about a particular technology/process held by the partner, rather than as a way to simply use or rent this know-how.	○	○	○	○	○	○	○

Each of the following statements seeks to better understand the overall health and performance of the alliance.

Please indicate whether you agree or disagree with each of the following:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
The alliance was characterized by strong and harmonious relationships between partners.	○	○	○	○	○	○	○
My company was successful in learning some critical skills and capabilities from the alliance partner.	○	○	○	○	○	○	○
There was a high level of trust in the working relationship with the partner.	○	○	○	○	○	○	○
My company achieved its primary objectives in forming this alliance.	○	○	○	○	○	○	○
My company's competitive position has been greatly enhanced by this alliance.	○	○	○	○	○	○	○

Please evaluate the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* initiative along the following criteria:

Please evaluate the alliance along the following criteria:

	Extremely Unsuccessful	Very Unsuccessful	Unsuccessful	Neither Unsuccessful or Successful	Successful	Very Successful	Extremely Successful	N/A
Meeting Schedule	○	○	○	○	○	○	○	○
Technical Performance	○	○	○	○	○	○	○	○
Controlling Costs	○	○	○	○	○	○	○	○
Fulfilling Customer Needs	○	○	○	○	○	○	○	○
Avoiding Litigation	○	○	○	○	○	○	○	○
Commercial Success	○	○	○	○	○	○	○	○
Overall Results	○	○	○	○	○	○	○	○

In terms of the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* initiative, which of the following benefits did your cooperation with this particular partner bring?

In terms of the alliance in question, which of the following benefits did your cooperation with this particular partner bring?

	No Such Benefit	Very Little Benefit	Little Benefit	Moderate Benefit	Some Benefit	High Benefit	Very High Benefit
Improving current products and/or services	○	○	○	○	○	○	○
Creating completely new products and/or services	○	○	○	○	○	○	○

Knowledge Processes

In the following two sections you will be asked to indicate your level of agreement with a variety of statements regarding the communication and knowledge processes that take place within your organization. Your answers will help us better understand how alliance strategy is implemented. As you review each statement, please keep the *${q://QID92 /ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* initiative at the top of mind.

Please indicate whether you agree or disagree with each of the following:

In the following two sections you will be asked to indicate your level of agreement with a variety of statements regarding the communication and knowledge processes that take place within your organization. Your answers will help us better understand how alliance strategy is implemented.

Please indicate whether you agree or disagree with the following statements.

In the following two sections you will be asked to indicate your level of agreement with a variety of statements regarding the communication and knowledge processes that take place within your organization. Your answers will help us better understand how alliance strategy is implemented. As you review each statement, please keep the alliance in question at the top of mind.

Please indicate whether you agree or disagree with each of the following:

In my organization...

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
Client complaints often fall on deaf ears.	○	○	○	○	○	○	○
We have frequent interactions with others in the industry to acquire new knowledge.	○	○	○	○	○	○	○
Employees record and store newly acquired knowledge for future reference.	○	○	○	○	○	○	○
We are slow to recognize shifts in the environment (e.g. competition, regulation and demography).	○	○	○	○	○	○	○
We have difficulty implementing new products and new processes.	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
We constantly consider how to better exploit knowledge.	○	○	○	○	○	○	○
We have a clear division of roles and responsibilities.	○	○	○	○	○	○	○
We quickly recognize the usefulness of new external knowledge to existing knowledge.	○	○	○	○	○	○	○
Grasping the opportunities from new external knowledge is a laborious undertaking.	○	○	○	○	○	○	○
We regularly consider the consequences of changing market demands in terms of new products and services.	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
It is clearly known how activities within and between departments should be performed.	○	○	○	○	○	○	○
Employees are engaged in cross-functional work.	○	○	○	○	○	○	○
We are able to quickly identify new opportunities to meet our customer needs.	○	○	○	○	○	○	○
We quickly analyze and interpret changing market demands.	○	○	○	○	○	○	○

Knowledge Processes 2.1

For the following questions, please continue to keep in mind the specific initiative you have specified.

Continuing the previous section, the following statements describe specific communication and knowledge processes.

Please indicate whether you agree or disagree with each of the statements to follow.

In my organization...

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
Our employees have a common language regarding our products and services.	○	○	○	○	○	○	○
We often rely on external partners for required knowledge that we do not specifically possess.	○	○	○	○	○	○	○
When facing a task or obstacle outside of our expertise, we easily determine who would have the necessary information or skills to solve the task or surmount the obstacle.	○	○	○	○	○	○	○
Employees hardly share practical experiences with one another.	○	○	○	○	○	○	○
We consciously build ties with known "experts" in order gain actual access to that expert knowledge should a need arise.	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
We periodically meet to discuss consequences of market trends and new product development.	○	○	○	○	○	○	○
We regularly approach third parties outside the industry (such as professional organizations) to gather information.	○	○	○	○	○	○	○
Individuals know what task-related skills and knowledge they each possess.	○	○	○	○	○	○	○
We assign tasks to commensurate with task-relevant knowledge and skill.	○	○	○	○	○	○	○
We organize special meetings with customers, suppliers, or third parties to acquire new knowledge.	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
We possess a good map of individual, group and partners' talents and skills.	○	○	○	○	○	○	○
We are hardly in touch with other firms and stakeholders in the industry.	○	○	○	○	○	○	○
When confronted with a task or problem in which we do not possess all the necessary expertise, we coordinate the retrieval of information from known "experts."	○	○	○	○	○	○	○
We collect information through informal means (e.g. lunch or social gatherings with customers and suppliers, trade partners and other stakeholders).	○	○	○	○	○	○	○
Knowing what other people know allows us to retrieve information beyond personal networks, group boundaries, and even organizational boundaries.	○	○	○	○	○	○	○

Alliance Data - Executive

The sections to follow seek to better understand your organization's current and past usage of strategic alliances. For each question, please think about the entire portfolio of your organization's strategic alliances. ***(If you have already responded to questions about an individual alliance, these questions may appear repetitive. Please be sure to consider the entire portfolio of alliances when answering.)***

In reviewing the last 5 years, please indicate how successful your company was in achieving the the goals and objectives of its strategic alliances.

	Not A Goal	Very Unsuccessful	Unsuccessful	Neutral	Successful	Very Successful
Developing products, technologies, resources	○	○	○	○	○	○
Achieving competitive advantage	○	○	○	○	○	○
Overcoming legal / regulatory barriers	○	○	○	○	○	○
Developing technical standards	○	○	○	○	○	○
Risk reduction & risk diversification	○	○	○	○	○	○
Cost sharing, pooling of resources	○	○	○	○	○	○
Achieving vertical integration, recreating and extending supply links in order to adjust to environmental changes	○	○	○	○	○	○

	Not A Goal	Very Unsuccessful	Unsuccessful	Neutral	Successful	Very Successful
Gaining access to new technology and/or converging technologies	○	○	○	○	○	○
Restructuring, improving performance	○	○	○	○	○	○
Cooperation with potential rivals, or pre-empting competitors	○	○	○	○	○	○
Obtaining economics of scale	○	○	○	○	○	○
Complementarity of goods and services to markets	○	○	○	○	○	○
Co-specialization	○	○	○	○	○	○
Diversifying into new businesses	○	○	○	○	○	○

	Not A Goal	Very Unsuccessful	Unsuccessful	Neutral	Successful	Very Successful
Acquiring means of distribution	○	○	○	○	○	○
Legitimation, bandwagon effect, following industry trends	○	○	○	○	○	○
Market seeking	○	○	○	○	○	○
Learning & internalization of tacit, collective and embedded skills	○	○	○	○	○	○
Other	○	○	○	○	○	○

What specific types of agreements has your organization formed with partners? *(check all that apply)*

- ☐ Technology
- ☐ Sales
- ☐ Marketing
- ☐ Research
- ☐ Development
- ☐ Manufacturing
- ☐ Supply
- ☐ Channel and Distribution
- ☐ Outsourcing
- ☐ Cross Border
- ☐ Other

Please indicate whether you agree or disagree with the following statements.

In forming alliances, my organization's objective is to:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
Build or enhance our internal knowledge base.	○	○	○	○	○	○	○
Acquire skills or know-how from partners.	○	○	○	○	○	○	○
Learn about a particular technology/process held by the partner, rather than as a way to simply use or rent this know-how.	○	○	○	○	○	○	○
Maintain our own resources and capabilities while relying on our partner(s) to fill in resource and/or capability gaps.	○	○	○	○	○	○	○
Combine our existing specialized knowledge with that of our partner(s) to create synergies.	○	○	○	○	○	○	○
Maximize the utilization of complementary assets between our firm and partner firm(s).	○	○	○	○	○	○	○

Alliance Strategy - Exec

The following questions are to understand the role alliances have played in your company's performance. Please continue to consider the company's entire alliance portfolio (versus one ore more specific alliances) when answering.

Please indicate whether you agree or disagree with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
There is a high level of trust in the working relationships with our partners.	○	○	○	○	○	○	○
The company's competitive position has been greatly enhanced by alliances.	○	○	○	○	○	○	○
Our company has achieved its primary objectives in forming alliances.	○	○	○	○	○	○	○
Our alliances are characterized by strong and harmonious relationships between partners.	○	○	○	○	○	○	○
The company has been successful in learning some critical skills and capabilities from its alliance partners.	○	○	○	○	○	○	○

When considering your entire portfolio of alliances, which of the following benefits did your cooperation with external partners bring to your company over the last five years:

	No Such Benefit	Low Benefit	Some Benefit	High Benefit	Very High Benefit
Improving current products and/or services	○	○	○	○	○
Creating completely new products and/or services	○	○	○	○	○

What is your company's overall alliance success rate (*% of alliances where the initial goals were realized*) over the last five years?

Project Identification

Finally, please recall a specific alliance that you feel is representative of your company's alliance portfolio. While the alliance need not be active today, it should have been active within the last three years. Additionally, the alliance must have passed a comprehensive performance review period during those three years.

Please describe the overarching objective(s) of this alliance in a few words:

In order to help identify this alliance, without providing any company names, please provide a brief title:

Were you personally responsible for managing and/or familiar with the detailed workings and performance of the alliance?

○ Yes ○ No

Would you be able to answer some questions about the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* alliance?

○ Yes ○ No

We would like to ask some additional questions from the individual(s) responsible for managing the *${q://QID92/ChoiceTextEntryValue} ${q://QID51/ChoiceTextEntryValue}* alliance. We would appreciate if you could provide the name and contact information of that individual (or individuals) for us.

Please note: we can assure complete confidentiality for you and any individual(s) you may identify. Contact information you provide will be used to distribute a follow-up survey, but will not be associated with either survey or any responses. Additionally, both you and any individual(s) you may identify will be eligible to enter into a random drawing for an iPad upon survey completion. You will have the ability to enter this drawing in the next section.

We would appreciate if you could provide the name and contact information of another individual (or individuals) who could answer some detailed questions regarding the *${q://QID92/ChoiceTextEntryValue} ${q://QID51*

/ChoiceTextEntryValue} alliance. The individual specified should be familiar with the alliance, processes that occurred during the alliance, and details about the alliance performance.

Please note: we can assure complete confidentiality for you and any individual(s) you may identify. Contact information you provide will be used to distribute a follow-up survey, but will not be associated with either survey or any responses. Additionally, both you and any individual(s) you may identify will be eligible to enter into a random drawing for an iPad upon survey completion. You will have the ability to enter this drawing in the next section.

	Name	Title	Email
Contact Person 1			
Contact Person 2 (if needed)			

Project Manager: Identify Exec

Finally, we would like to ask some additional questions from the individual(s) in your organization responsible for managing and implementing alliance partner strategy. For example, the Vice President of Strategic Alliances or Vice President of Corporate Development. We would appreciate if you could provide the name and contact information of that individual for us.

Please note: we can assure complete confidentiality for you and any individual(s) you may identify. Contact information you provide will be used to distribute a follow-up survey, but will not be associated with either survey or any responses. Additionally, both you and any individual(s) you may identify will be eligible to enter into a random drawing for an iPad upon survey completion. You will have the ability to enter this drawing in the next section.

Name

Title

Email

Is the individual you have identified also responsible for directly managing the particular alliance detailed in your responses?

○ Yes ○ No

We have some additional questions to ask of the individual responsible for managing the alliance in question and would appreciate if you could provide the contact information for that individual.

Name

Title

Email

ipad entry

You have reached the end of the survey!

Please leave your name and e-mail address if you are interested in receiving the aggregate results of the survey at the end of this research project. If you do not want to receive the results, then directly press the 'next' button.

Name

Email Address

Retype Email Address

Would you like to be entered into the drawing for an iPad?

○ Yes ○ No

Is there anything you would like to add? If you would like to add any comments regarding the topic of alliances, knowledge management, or this survey in general, then please feel free to use the following textbox to leave a message:

End of Survey

END OF SURVEY

Thank you very much for your participation.

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Schneider, D.R., "The Role of Absorptive Capacity in Knowledge Accessing Alliances," Midwest Academy of Management Conference, October 2011, Omaha, NE.

Schneider, D.R., and Weidner, K., "The Role of New Media in Marketing: A Study of Women Entrepreneurs," UIC Research Symposium on Marketing and Entrepreneurship, August 2007, Washington, D.C.

Lumpkin, G.T., Cogliser, Claudia C., Schneider, D.R., "Understanding and Measuring Autonomy: An Entrepreneurial Orientation Perspective", presented at the Max Planck Ringberg Conference on Entrepreneurship, Tegernsee, Germany, June 2007

Areas of Research Interest

- Marketing and Innovation strategy
- Marketing partnerships and relationships
- Team dynamics and processes
- Organizational use of social media

Ad Hoc Reviewing

Midwest Academy of Management Conference, 2011
Track: Strategy and Organization
UIC Symposium on Marketing and Entrepreneurship, 2007, 2008
AMA Winter Marketing Educators' Conference, 2007
Track: "Value Creation and Appropriation Through Products and Services"

Teaching Experience

Marketing 360: Introduction to Marketing (undergraduate), University of Illinois at Chicago
Rating: 4.25/5.0, 4.77/5.0
Marketing 310: Hospitality Marketing (undergraduate), Saint Xavier University (Fall 2014)
Marketing 340: Consumer Behavior (undergraduate), Saint Xavier University (Fall 2014)
Marketing 380: Marketing Strategy (undergraduate), Saint Xavier University (Fall 2014)

Teaching Interests

New Product Development
Marketing Strategy
Digital Marketing
Marketing Communications
Consumer Behavior

Doctoral Coursework

MARKETING
International Marketing with Cheryl Nakata
Marketing Theory with Joseph Cherian
Consumer Research with José Rosa
New Product Development with Albert L. Page
Marketing and Entrepreneurship with Gerald E. Hills
Services Marketing with Albert L. Page
Independent Study in Information and Decision Sciences with Mary Beth Watson-Manheim

METHODS
Quantitative Models in Marketing with Jun Yu (Marketing)
Data Analysis I with Seung-Whan Choi (Political Science)
Data Analysis II with Seung-Whan Choi (Political Science)
Advanced Analysis of Variance with Laura Szalacha (Educational Psychology)
Hierarchical Linear Modeling with George Karabatsos (Educational Psychology)

Professional Employment

Smithbucklin Corporation, Chicago, IL
Influence Program Coordinator, Americas' SAP Users' Group, 2004-2005

Make-A-Wish Foundation, Chicago, IL
Development Associate, 2003-2004

HotJobs.com, Chicago, IL
Sales Administration Manager, 2000-2003