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Understanding Collaborative Dynamics: A Critical Review and Inductive Investigation

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UNDERSTANDING COLLABORATIVE DYNAMICS:
A CRITICAL REVIEW AND INDUCTIVE INVESTIGATION

UNDERSTANDING COLLABORATIVE DYNAMICS:
A CRITICAL REVIEW AND INDUCTIVE INVESTIGATION

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Business Administration

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ABSTRACT

Collaboration has been a topic of discussion for over 20 years. Managers are consistently calling for better collaboration and researchers have argued that managing tightly coupled relationships creates a co-mingling of complementary competencies that establishes distinctive advantages for firms. Even though there have been a few exemplar companies that have been capable of truly developing these complementary competencies, few companies truly understand the dynamics of a collaborative capability. This dissertation reviews the theoretical conceptualization and operationalization of tightly coupled relationships and through an interpretive analysis, begins to provide clarity to the following questions:

- Under what conditions are tightly coupled relationship strategies justified?
- What are the elements that constitute effective relationship strategies?
- How can these elements be dynamically configured to deliver superior value and firm performance?

Essay 1 sets up the theoretical foundation for the dissertation through an in-depth review of the current collaboration/integration literature and delineates and summarizes contrasting dimensions in supply chain relational strategies. An orienting conceptual framework is developed to provide clear insights for the analysis that is conducted in essay 3. Essay 2 focuses on the ontological and epistemological aspects of hermeneutics and promotes the use of this methodology for future research in the supply chain field. Because this methodology is new to the supply chain field a full methodological guideline is described and explained. Through a hermeneutical analysis, Essay 3 evaluates the operationalization of tightly coupled relationships using interview data from a combination of 11 manufacturers and retailers who practice collaborative behavior. The literature review and the orienting conceptual framework from Essay 1 are used to set the stage for the hermeneutical analysis. From the analysis, a framework is developed for use in future research.

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DEDICATION

Although I have not been an academician for very long, I have been involved in higher education for the last twenty-six years. My first real exposure was when I supported my husband, Stan Fawcett, through his doctoral and dissertation work when we were first married. While raising our family, I continued to be involved in Stan's research as it evolved through the years. It was this involvement that set me on the path that I am currently following.

Six years ago when I came to Stan and told him that I needed to go back to school, he was totally supportive of my endeavors. I don't think he realized at the time what his support was going to cost him. He has sacrificed so much to allow me to pursue my doctorate. There is no way that I can begin to thank him enough or repay him for his devotion over the last several years.

Not only has Stan been supportive, but my six children, Carisa, Tannen, Kjanela, Dallin, Keana and Taft have. Pursuing my doctorate changed their lives completely. For the four youngest, it meant they had to leave their friends and home and move to Arkansas for three years. For my oldest daughter it meant that I couldn't be there as much as I wanted to be as she began her family and started to have children. I cannot thank them enough for their sacrifice and support, for picking up the slack, cleaning and cooking when they were asked and especially when they were not asked.

This dissertation is dedicated to my family, for their unconditional love, patience, fortitude, understanding and humor. They have made it possible for my desire to become a Doctor of Philosophy a reality. You all are my heroes! I love you "all the way around!"

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I. INTRODUCTION

A. DISSERTATION TOPIC AND RATIONALE

“We need better collaboration.” This was the tag line for a Forbes article just a few years ago (Ross, 2011). However, this phrase is more than just a buzzword. It cannot be ignored. For both managers in the corporate setting and researchers alike, the ability to collaborate in today’s marketplace is more important than it ever was before. Supply chain networks are becoming increasing longer and getting the product or service into the market is more difficult. This is due to a much larger scale of people, companies, employees, and practices throughout the supply chain and within organizations than ever before (Ross, 2011). Communication is increasingly requiring insider knowledge, and technological advances have changed the way we do business.

Teams have become global and the workforce is now virtual. Large, multinational organizations are finding it harder to achieve a transfer of knowledge and to make timely decisions. Telephone, email, and instant messaging have diffused the workplace and created a more global workforce. The separate functions within an organization and across the entire supply chain are no longer viable. While the use of today’s information technologies has shown to promote organizational coordination (Sanders, 2008), the solutions have not (Thun 2010). A relational capability of a more cooperative nature is needed to allow firms to achieve greater firm performance and link their complementary competencies (Fawcett et al., 2012).

In the early 70’s, collaboration research began to appear, it was based in the Transaction Cost Economics (Williamson, 1979) mindset and promoted collaborative efforts via arms-length relationships. Decision makers often focused on internal operations and efficiencies (Porter, 1980; Richey et al., 2010). In the early 80’s Just-in-Time philosophies came to fruition with the market success of Japanese manufacturers (Hayes and Wheelwright, 1984; Schonberger, 1982). Companies like Honda, Sharp, and Toyota used longer-term relationships to structure their lean

manufacturing strategies (Schonberger, 1986; Womack, Jones, and Roo, 1990). This led theorists to view supply chain relationships as a source of competitive advantage (Dyer and Singh, 1998; Gulati and Singh, 1998). Dyer and Singh (1998) suggested that a firm's competitiveness relies on its ability to collaborate with supply chain partners to create and deliver unique customer value demand.

*See Figure 1:
Evolution of Supply Chain Relationships*

Dyer's and Singh's research promoting the Relational View focused heavily on the automobile industry, comparing and contrasting relational capabilities among Japanese and U.S. automakers and the resulting differences in firm performance (e.g., Dyer, Cho, and Chu, 1998; Dyer, 1996; Dyer, 2006; Hatch and Dyer, 2004) Honda and Toyota emerged as relational exemplars. Honda's business model, for example, relied on high-quality buyer/supplier relationships through which Honda sources 85% of the value of its cars (Nelson, Mayo, and Moody, 1998; Nelson, Moody, and Stegner, 2001; Liker and Choi, 2004). Similarly, Toyota leveraged strong buyer/supplier relationships to enhance knowledge sharing and achieve a faster rate of learning. Specifically, buying from the exact same automotive suppliers as its U.S. competitors, Toyota was able to reduce supplier defects by 50%. The largest U.S. automaker achieved only a 26% defect reduction (Dyer and Hatch, 2006).

Further, past research indicates that improved collaborative capabilities enable companies beyond the automobile industry to achieve competitive advantage via faster new product development cycles, improved quality, lower product and supply chain costs, shorter fulfillment times, and enhanced customer service (Cachon and Fisher 2000; Frohlich 2002; Ketchen, Hult, and Slater 2007; Rinehart, Lee and Page 2008). A growing body of empirical research shows that the effective co-mingling of supply chain relationships has improved firm performance (Allred,

Fawcett, and Wallin, 2011; Dyer and Hatch, 2006; Gulati, Nohria, and Zaheer, 2000). Research indicates that organizational interdependence in terms of shared knowledge and skills coupled with a deep understanding of an organization's supply chain lead to a competitive advantage (Zacharia, Nix, and Lusch, 2009).

However, despite decades of observing and seeking to imitate Honda and Toyota's relational advantage, only a few additional collaborative exemplars have been identified and discussed in the literature. Unfortunately, decision makers still know relatively little about the process through which companies develop the collaborative capabilities needed to achieve differential performance (Madhok, 2002; Lavie, 2006; Newbert 2007; Barreto, 2010). Although managers recognize that the resources and routines requisite to creating distinctive competencies often reside outside their organizational boundaries (Dyer and Singh, 1998; Lavie, 2006; Barreto, 2010), few firms fully understand the nature of an appropriate relational capability (Jacobides, 2006). Further, they don't understand the managerial complexity and inter-firm rivalry that prevent companies from collaborating together (Fawcett, Magnan and McCarter, 2008; Park and Ungson, 2001). Many studies have shown that companies struggle in collaborative efforts (Park and Ungson, 2001; Nyaga, Whipple, and Lynch, 2010; Fawcett, Ellram, and Ogden, 2007; Park and Russo, 1996). For example, Park and Ungson (2001) reviewed the literature related to alliance failure and found that strategic alliances are a specific and popular organizational structure designed to achieve relational advantage, evaluating alliance success or failure informs our ability to work together collaboratively. Fawcett et al. (2007) found that fewer than 10% of companies are sufficiently satisfied with collaborative relationships to achieve high levels of commitment to relational strategies. In addition, Hendricks and Singhal in their study on SC

disruptions, (2008) noted that collaboration challenges cost companies a 10.28% decrease in shareholder profits.

Interestingly, over the last few years empirical consensus has yet to emerge with respect to the advantages to collaboration. Some findings have demonstrated either non-significant or negative relationships between tightly coupled relationships and firm performance. In 2012, Koufteros, Vickery, and Droge found that supplier development and partnerships do not always provide the expected benefits desired. Thun (2010) suggests that some companies' IT implementation is impeding integration and performance because they have been unable to align their IT solutions with their supply chain strategy.

Although the foundational principles of relational strategies have been explicated, it is apparent that decision makers need to better understand the motivations for, the impediments to, and the enablers of a relational capability. Therefore, the purpose of this dissertation is to enrich theory related to understanding the collaborative dynamics that occur between organizations, identify the conditions under which tightly coupled relationship strategies are justified, and to explain more fully the elements that constitute an effective relationship strategy.

Discrepancies in the research findings clearly illustrate that despite the intuitive appeal and intense interest in tightly coupled supply chain relationships, our understanding of how to effectively conceptualize and operationalize such relationships is still developing. Current research shows more complex and nuanced relationships exist between close supply chain relationships and improved performance. For example, Terjesen, Patel, and Sanders, (2012) show that the relationship between supply chain integration and operational performance is an inverse U, suggesting that there are costs to a high degree of internal and external integration. Das, Narasimhan, and Talluri (2006) found that there is an optimal level of integration. Efforts

that fall below or above this optimum diminish performance. Further, effective internal integration antecedes external integration and improved performance. This reality suggests that a more nuanced exploration into the dynamics of tightly coupled supply chain relationships is needed.

Goldsby et al., (2013) suggest that the exclusion of important moderator variables in current research has led to overgeneralizations that fail to illuminate the boundary conditions under which supposed relationships exist. Therefore, they suggest that in order to leverage moderation effectively, it is critical to understand the connection between moderation and measurement of the theoretical constructs (Goldsby et al., 2013). Because these connections are complex and nuanced researchers may need to be creative in finding the proper moderators for multifaceted situations. Inductive/qualitative research is one possible approach. Inductive research is used to build understanding and permit alternative explanations to phenomenological events. More specifically, interpretive research based on hermeneutic principles can create better understanding between subjects and their social and cultural context and develop a better awareness and understanding of nuanced relationships (Thompson, 1997). Therefore, hermeneutics was chosen as the primary methodology for this dissertation.

B. DISSERTATION STRUCTURE

The dissertation follows the following structure. The first essay reviews the theoretical conceptualization and operationalization of tightly coupled supply chain relationships. It focuses on 15 leading supply chain journals, 43 theory-driven articles are identified and evaluated from the supply chain collaboration and integration literatures. Although the co-mingling of competencies is a central theme within supply chain research, it is found that major

methodological and measurement issues blur our understanding of the nature of the link between tightly coupled relationships and performance.

Essay 2 focuses on the ontological and epistemological aspects of hermeneutics—a leading interpretive research genre making a presence in the management fields. While qualitative/interpretive research is not completely new to the supply chain field, the methodologies used have been limited. This article gives a brief overview of the current state of qualitative/interpretive research and introduces the need for a hermeneutic approach. Further, the historical evolution of contemporary hermeneutics is discussed, clarifying the hermeneutic ‘Circle of Understanding.’ Finally, some methodological guidelines and examples for employing hermeneutics in supply chain research are clarified.

Essay 3 is a culmination of Essay 1 and Essay 2. Based off of the literature review and orienting conceptual framework from Essay 1, Essay 3 uses a hermeneutical analysis described in Essay 2 to evaluate the operationalization of relational strategies suggested in Essay 1. Interview data from a combination of 11 manufacturers and retailers who practice collaborative behavior is used. Through an iterative approach based on the value-appropriation vs. distinctive value co-creation orienting conceptual framework, we identify the conditions under which tightly coupled relationship strategies are justified and the elements that constitute an effective relationship strategy. From these findings the cognizance, commitment, capability framework is introduced. Essay 3 is followed by a concluding discussion and future research section.

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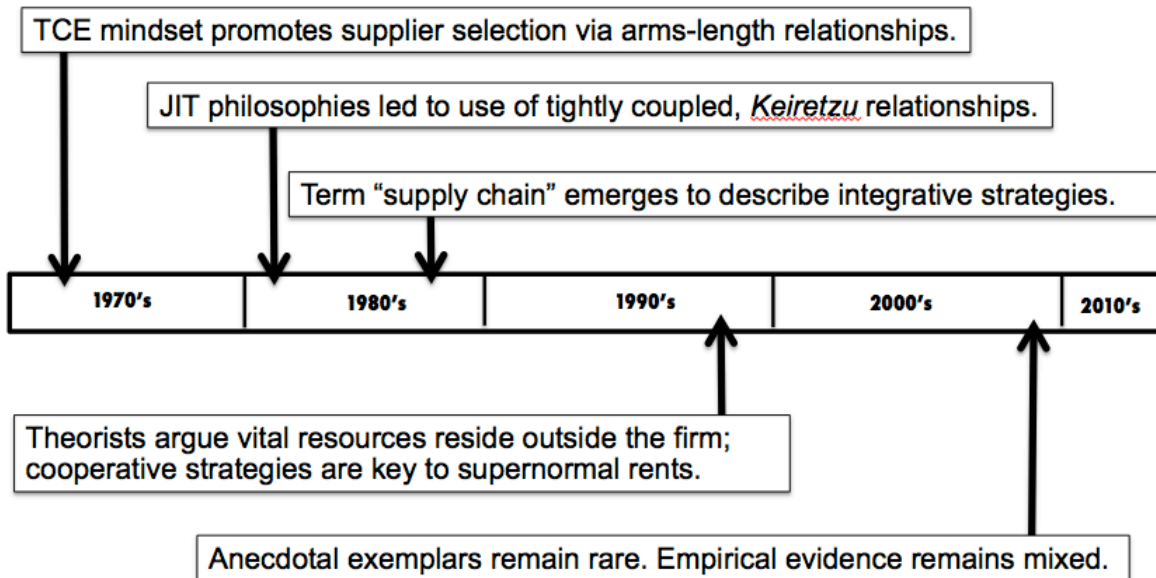
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D. FIGURES

Figure 1: Evolution of Supply Chain Relationships



II. ESSAY 1: RELATIONAL STRATEGIES IN SUPPLY CHAINS: A CRITICAL REVIEW OF THE EMPIRICAL RESEARCH

A. ABSTRACT

Since the 1990s, researchers have argued that appropriate management of supply chain relationships is a determinant of firm performance. The literature argues that managing relationships to enable the co-mingling of complementary competencies across a supply chain network can help a firm establish a distinctive advantage. We therefore review the theoretical conceptualization and operationalization of these tightly coupled supply chain relationships. Focusing on 15 leading supply chain journals, we identified and evaluated 43 theory-driven articles from the supply chain collaboration and integration literatures. We find that although the co-mingling of competencies is a central theme within supply chain research, major methodological and measurement issues blur our understanding of the nature of the link between tightly coupled relationships and performance. Clarity is needed regarding 1) the conditions under which tightly coupled relationship strategies are justified, 2) the elements that constitute an effective relationship strategy, and 3) how these elements can be dynamically configured to deliver superior value and firm performance.

B. INTRODUCTION

Decision makers widely acknowledge that supply chain relationships can help or hinder a firm's quest to achieve a competitive advantage (Porter, 1991; Cooper et al., 1997; Frohlich and Westbrook, 2001; Koufteros et al., 2005; Richey et al., 2010; Sanders, 2008; Narasimhan et al., 2010; Fawcett et al., 2012). Over the past 20 years, the literature has increasingly argued that more tightly coupled relationships enable the exchange and co-mingling of complementary competencies among members of a supply chain to confer relational rents (Harrison et al., 2001;

Fawcett et al., 2012, Mentzer et al., 2008). However, empirical research demonstrates that relational strategies are challenging to design and difficult to implement (Richey, 2010). Despite the well-documented success of relational exemplars, many firms struggle to establish a strong relational capability and put in place the governance structures needed to balance the self-interest of decision makers with the interdependency that exists among firms within the supply chain (Senge, 2006; Richey et al., 2010). Given the centrality of tightly coupled relationships to supply chain strategy, a critical review of the literature to document our state of understanding and identify vital next steps is timely.

As Table 1 illustrates, a growing body of empirical research links the effective co-mingling of supply chain competencies to improved firm performance (Allred et al., 2011; Dyer and Hatch, 2006; Fawcett et al. 2011; Gulati et al. 2000). Frohlich and Westbrook (2001) along with other researchers indicate that close working relationships and shared resources are associated with productivity and market share performance (Narashimhan and Kim, 2002; Rosenzweig et al., 2003; Nyaga et al., 2010; Allred et al., 2011; Cao and Zhang, 2011; Huo, 2012; Schoenherr and Swink, 2012). Research further indicates that organizational interdependence in terms of shared knowledge and skills coupled with a deep understanding of an organization's supply chain lead to competitive advantage (Zacharia et al., 2009). Importantly, emerging research reveals that the ability to work closely with other members of a firm's supply chain network enables companies to achieve competitive advantage via faster new product development cycles, improved quality, lower product and supply chain costs, shorter fulfillment times, and enhanced customer service (Cachon and Fisher, 2000; Frohlich, 2002; Ketchen et al., 2007; Rinehart et al., 2008).

See Table 1:
Exploring the Empirical Link between Tightly Coupled SC Relationships and Performance

However, empirical consensus has yet to emerge. Some empirical research has demonstrated either non-significant or negative relationships between tightly coupled supply chain relationships and firm performance (see Table 1). For example, Koufteros et al, (2012) found that supplier development and partnership do not provide performance benefits. Thun (2010) suggests most companies are unable to align their IT implementation with their supply chain strategy, impeding integration and thus performance improvements. Villena et al. (2007) show that executive risk bearing reduces willingness to make risky decisions and thus 1) discourages close working relationships among supply chain partners and 2) hinders performance improvements. Further, additional research shows more complex and nuanced relationships exist between close supply chain relationships and improved performance. For example, Terjesen et al, (2012) show that the relationship between supply chain integration and operational performance is an inverse U, suggesting that there are costs to a high degree of internal and external integration. Das et al. (2006) found that there is an optimal level of integration. Efforts that fall below or above this optimum diminish performance. Further, effective internal integration antecedes external integration and improved performance.

Discrepancies in the research findings clearly illustrate that despite the intuitive appeal and intense interest in tightly coupled supply chain relationships, our understanding of how to effectively conceptualize and operationalize such relationships is still developing. This reality suggests that a more nuanced theoretical exploration into the dynamics of tightly coupled supply chain relationships is needed. Decision makers know relatively little about why some firms can leverage tightly coupled supply chain relationships for competitive advantage and others cannot (Madhok, 2002; Lavie, 2006; Newbert 2007; Barreto, 2010). Critical questions regarding when and how to co-mingle complementary competencies appear to merit further investigation.

MacInnis (2011) suggests that conceptualization plays an important role along the discovery-justification continuum critical in today's research. This paper makes a conceptual contribution to the literature through an in-depth investigation that delineates and summarizes contrasting dimensions and measures researchers have used to explore supply chain relational strategies. We integrate the literature to reveal novel insights and develop an organizing conceptual framework that provides clear insight into future research development.

C. THE EVOLUTION OF SUPPLY CHAIN RELATIONSHIPS

For most of the previous century, the scale-economy and efficiency-oriented goals expounded by the theory of the firm (Coase, 1937) and transaction-cost economics (Williamson, 1979) motivated the development of supply chain relationships. These transaction-focused theories identify the firm as the essential entity of competition as well as of modern economic systems. Decision makers often focused on internal operations and efficiencies (Porter, 1980; Richey et al., 2010). The goal was to minimize costs and risks. A natural tendency was to pit suppliers against each other via competitive bidding in order to obtain the lowest costs (Dyer and Singh, 1998). Therefore, buyer/supplier relationships tended to be short-term, contractual, loosely coupled, and often adversarial (Williamson, 1981).

“Arms-length” supply chain relationships remained standard practice in American industry until the 1980s when the market success of Japanese manufacturers—including firms like Honda, Kawasaki, Sharp, and Toyota—led analysts to reevaluate manufacturing practices (Hayes and Wheelwright, 1984; Schonberger, 1982). Longer-term, more tightly coupled buyer/supplier relationships promoted by Just-in-Time sourcing and the Japanese Keiretsu structure were identified as central features of lean manufacturing (Schonberger, 1986, Womack, Jones, and Roo, 1990). Over time, the recognition that firms can use close working relationships

among members of supply networks to gain access to complementary resources led theorists to view supply chain relationships as a source of competitive advantage (Dyer and Singh, 1998; Gulati and Singh, 1998). These tightly coupled, trust-based relationships focus on joint learning through knowledge sharing routines (Das and Teng, 1998; Hayes, Wheelwright and Clark, 1988; Olson and Olson, 2000). Further, firms focus on forming network structures, combining resources interacting in inter-organizational routines and joint projects (Hofmann, 2011).

Because of the positive impact on the firm's competitive position, researchers have begun to study these practices more in depth. From this research, several streams of literature have emerged. However, for this particular study we have chosen to look at the supply chain integration and supply chain collaboration literature. Researchers from both literature streams look at how tightly coupled supply chain relationships improve firm performance (Simatupang and Sridharma, 2002; Rosenzweig et al., 2003; Daugherty et al., 2006; Handfield et al., 2009; Nyaga et al., 2010; Cao and Zhang, 2011; Kotzab et al., 2011; Wiengarten et al., 2012). They study inter-organizational routines and processes that allow companies to access and combine complementary resources (Petersen et al., 2005; Devaraj et al., 2007; Sanders, 2008; Allred et al., 2011; Narayanan et al., 2011; Wong et al., 2011; Zacharia et al., 2011)

Although neither literature stream has generated a universally accepted definition of what it means to work closely with supply chain partners (Fawcett and Magnan, 2002; Pagell, 2004), researchers have begun to settle on some definite features regarding these relational strategies. The integration literature tends to focus on the conceptual clustering of three elements: 1) communication and information sharing, 2) participation in inter-organizational decision making and 3) proactive planning (Flynn et al., 2010; Jayaram et al., 2010). Similarly, the collaboration literature focuses on practices that promote open information sharing, managerial interaction,

and goal alignment, (Nyaga et al., 2010; Allred et al., 2011; Cao and Zhang, 2011; Wiengarten et al., 2012). In essence, both of these literature streams suggest that two or more independent companies working closely together can achieve greater success than can be attained in isolation (Simatupang and Sridharam, 2002; Daugherty et al., 2006). Because the conceptualization and operationalization of these two literature streams run so closely together, both literatures were used in conducting this research.

D. METHODOLOGY

To identify the relevant literature in developing an organizing conceptual framework, an adapted version of the approach developed by David and Han (2004) is used. This approach is an objective approach, which mitigates bias that results when samples are selected by purely subjective criteria (Newbert, 2007). A key word search was conducted to identify articles related to supply chain collaboration, integration, and CPFR between 1990 and 2012 (David and Han, 2004; Newbert, 2007). David and Han (2004) argue that by restricting their search to scholarly journal articles, they enhanced quality control. Therefore, the article search was conducted in international journal databases (GoogleScholar, ABI/inform, Emerald, Wiley, EbscoHost, Sage, and ScienceDirect). Articles from these databases produce quality articles due to the rigorous peer review processes.

The goal was to identify a representative sample of studies that empirically tested the core tenets of supply chain integration and collaboration by searching the words “supply chain collaboration,” “supply chain integration” and “collaboration, planning, forecasting and replenishment”. The search identified 130 articles. After carefully reviewing the article abstracts for supply chain integration and collaboration dimensions, we discerned that 106 articles merited further evaluation.

Next, since the present analysis concentrates on a theoretical/conceptual, organizing framework, studies that did not identify specific theory development had no relevance in this study and were therefore excluded from the sample. Further, since the selected focus was on “real” situations of collaboration and integration, experiments, simulations, and literature reviews were excluded. Given these restrictions, 43 empirical studies on supply chain collaboration, integration and CPFR were left for deeper analysis.

E. SYNTHESIZING EXTANT RESEARCH

Following is an analysis of the selected 43 articles in supply chain integration and collaboration. The studies varied in contextual background and relationship type. Although the majority of the studies were conducted in the United States, (some were conducted in Asia and Europe), they also differed in their contextual focus. Integration and collaboration were studied in both vertical and horizontal relationships as well as within the boundaries of the firm or with other firms in the supply chain. The analysis synthesizes the conceptualization and operationalization of the measures used as well. Table 2 gives an overview the conceptualization, theoretical approaches, dimensions and findings/outcomes of all 43 articles reviewed.

*See Table 2:
Supply Chain Integration and Collaboration Conceptualization,
Theoretical Approaches, and Dimensions*

Types of Integration/Collaboration

Following Frohlich and Westbrook’s (2001) “Arcs of Integration” paper, there have been numerous studies that have advanced the literature on supply chain integration and collaboration in terms of measurement and intensity. However, there have been a wide variety of dimensions used to characterize the phenomenon. Usually, the literature groups integration and collaboration

into two types: internal and external (see Table 3). Internal integration and collaboration comprises more tactically oriented practices within the organization that match both design requirements and process capabilities (Droge et al., 2004). External integration and collaboration reaches across firm boundaries to involve supplier and customers (Droge et al., 2004).

*See Table 3:
External Only vs. External and Internal Papers Reviewed*

Internal Integration/Collaboration. Out of the 43 articles that studied supply chain integration/collaboration only 18 of the articles studied internal integration/collaboration (See Table 3). Interestingly, there was only one collaboration article identifying internal collaboration as an important dimension to external collaboration. Several of the findings indicate that internal capabilities directly improve external capabilities (e.g. Flynn et al., 2010; Huo, 2012; Schoenherr and Swink, 2012) (refer back to Table 1). Zhao et al., (2011) suggest that internal integration refers to the degree to which a firm can structure its organizational procedures, behaviors and practices into collaborative, synchronized and manageable processes in order to fulfill customer requirements (Chen and Paulraj, 2004; Kahn and Mentzer, 1996) Das et al., (2006) stress the importance of studying internal integration, claiming that external integration cannot be pursued prior to internal integration. Wong et al., (2011) argue that internal integration removes functional barriers and enables cooperation across internal functions and is the basis of supply chain integration.

There were six significant dimensions used to identify internal integration/collaboration: Connectivity, teaming, frequent contacts/meetings, joint product development, information sharing (operational), and shared expertise (See Table 4). Connectivity or data integration among internal functions of the firm was used the most often to identify successful internal

integration/collaboration practices (e.g., Allred et al., 2011; Flynn et al., 2010; Huo, 2012; Kotzab et al., 2011; Terjesen et al., 2012; Wong et al., 2011; Zhao et al., 2011). Terjesen et al., (2012) argue that internal integration is characterized by the ability to integrate through information technology, data, products and processes throughout the organization.

*See Table 4:
Dimensions Used in External/Internal and Upstream and Downstream SC
Integration/Collaboration Literature*

Teaming or cross-functional meetings were used to identify internal integration/collaboration (e.g. Das et al., 2006; Fawcett et al., 2012; Terjesen et al., 2012). Interviews from Fawcett et al., (2012) identify that in order for collaboration to be more effective, management teams are needed to manage internal accounts in other divisions and that co-locating personnel at OandM facilities is necessary. Another dimension that facilitates teaming is frequent contact within the organization. This dimension was used to identify successful internal integration and collaboration (e.g. Narasimhan and Kim, 2002; Terjesen et al.; Zhao et al., 2011). Narasimhan and Kim (2002) argue that for successful diversification, firms should have a coordination capability within the firm for managing internal diversity and complexity.

Another dimension that was identified as critical to internal supply chain integration and collaboration is joint product development (e.g. Koufteros et al, 2005; 2010; Kotzab et al., 2011, Wong et al., 2011). Wong et al., (2011) argue that organizations that work closely in supporting concurrent engineering and design for manufacturing increase their delivery, production costs, quality and flexibility. Internal joint product development can help companies to understand the requirements of their external collaborators, to work with them in product development, design, and strategic alliances (Huo, 2012).

External Integration/Collaboration. External integration and collaboration were looked at in a variety of ways and through different dimensions throughout the literature (see Table 4). According to Zhao et al., (2011) external integration refers to the degree to which a firm can partner with its key supply chain members to structure their inter-organizational strategies, practices, procedures and behaviors into collaborative, manageable and synchronized processes in order to fulfill customer requirements (Stank et al., 2001; Chen and Paulraj, 2004). Many researchers separated external integration into upstream and downstream directions, where other research did not identify direction. Upstream and downstream will be discussed in the next section.

Integration/Collaboration Direction

Upstream Integration/Collaboration. Out of the 43 articles reviewed, 27 of the articles specifically looked at upstream integration and collaboration (see Table 4). The main dimensions used to measure upstream integration/collaboration were: information sharing geared toward operational goals, joint product development, connectivity, alliances/partnerships, process improvement, invest in partner capabilities, shared expertise, stability, and joint planning. In general these dimensions focus on working with the suppliers to jointly resolve problems and facilitate operation. Swink et al., (2007) explain that upstream integration is the process of obtaining and distributing pertinent information with respect to forecasts and related knowledge with the supplier and vice versa.

Out of the 27 articles that looked specifically at upstream integration/collaboration, 14 of them used information sharing (operational) and joint product development as measurement items. Because upstream integration is more focused on operations and production planning, information measurement items are directed toward sharing production plans (Frohlich and

Westbrook, 2001; Devaraj et al, 2007; Swink et al., 2007; Flynn et al., 2010; Wong et al., 2011; Zhao et al., 2011), direct communication between production schedulers at buyer and seller plants (Das et al., 2006;), cost information (Devaraj et al., 2007; Swink et al., 2007), and demand forecasts (Flynn et al., 2010).

Zhao et al., (2011) suggest that the measurement of supply chain integration is mainly governed by an information systems and process management perspective. Nine articles measure supply chain integration and collaboration by looking at the participation level of suppliers in the process of procurement production (Narasimhan and Kim, 2009; Handfield et al., 2009; Zhao et al., 2010) and fully integrated processes (Whipple and Russell, 2007). Further, the ability to connect with upstream is also used to measure integration and collaboration. Measurement items that refer to connectivity include the following: access to planning systems/joint networks (Frohlich and Westbrook, 2001; Flynn et al., 2010) information exchange through technology (Narasimhan and Kim, 2002; Handfield et al., 2009; Kim, 2009; Wong et al., 2011), and level of technology capability (Zhao et al., 2011).

Downstream Integration/Collaboration. Fewer researchers measured downstream integration and collaboration. Only 16 articles look at the dimensions to downstream integration. While downstream integration is also concerned with connectivity, downstream dimensions are geared more toward strategic information sharing rather than operational (see Table 4). Researchers also measure frequent contacts/meetings, and feedback. Swink et al., (2007) suggest that strategic downstream integration is the process of obtaining and integrating customer needs and related information.

Researchers measured organizations ability to connect with their downstream partners by looking at the level of organic linkage with customers through information networks (Narsimhan

and Kim, 2002; Zhao et al., 2008; Kim 2009; Flynn et al, 2010; Wong et al., 2011; Zhao et al., 2011) and the level of computerization for customer ordering (Kim, 2009; Flynn et al., 2010; Zhao et al., 2011). Strategic information sharing was measured by looking at the level of market information sharing from the customer (Narsimhan and Kim, 2002; Zhao et al., 2008; Kim 2009; Flynn et al, 2010; Wong et al., 2011; Zhao et al., 2011). Some activities that are often associated with measuring better strategic downstream integration include frequent customer contacts (Narsimhan and Kim, 2002; Zhao et al., 2008; Kim 2009; Flynn et al, 2010; Wong et al., 2011; Zhao et al., 2011), communication of satisfaction surveys (Swink et al., 2007), and both formal and informal direct employee-customer interactions (Swink et al., 2007).

Extent of Integration/Collaboration

Most of the literature reviewed studied first-tier collaboration, only looking at one level up or down the supply chain. However, there were a few articles that looked at multi-tier or both upward and downward integration and collaboration efforts. Frohlich and Westbrook (2001) were the first ones to take a look both directions. Specifically, they looked at the operationalizing arcs of integration. The five arcs of integration representing inward-, periphery-, supplier-, customer-, and outward-facing groups were evaluated. The greatest arcs of supplier and customer integration had the strongest association with performance improvement (Frohlich and Westbrook, 2001). Schoenherr and Ssink, (2012) extend the work of Frohlich and Westbrook and validate the findings in a different context and provides insight into the changing levels of integration in business firms. They reiterate the argument that firms should pursue both upstream and downstream integration (Schoenherr and Swink, 2012).

Several researchers analyze the depth and scope of various collaboration forms, examining companies' attitudes towards different collaboration areas. For example, Skjoett-Larsen et al.,

(2003) suggest that there are many different levels of collaboration. They identify them as basic, developed and advanced. Whipple and Russell, (2007) through exploratory interviews, introduce a typology of three types of collaborative relationships approaches: collaborative transaction management, collaborative event management, and collaborative process management. Fawcett et al., (2008) suggest that collaboration is a change process and that there are three stages to the process. As companies cross phases to promote change they achieve higher levels of SC collaboration. The higher the stage the more tiers up and downstream are integrated into the collaboration process (Fawcett et al., 2008).

Nature of Integration/Collaboration Research

The nature of supply chain integration and collaboration is defined by how it is measured through surveys and interviews. Figure 1 shows the top twenty dimensions used to define the nature of integration and collaboration research. Of these dimensions, the most common dimensions are connectivity, frequent contacts and meetings, information sharing both strategic and operational, joint product development, joint process management, shared expertise and teaming. There have been some scales developed for these items, however most of these scales are used by a certain group of researchers. It is interesting to see, that as we take a closer look at how researchers are measuring these scales they are truly measuring different things. There is not a consistent conceptualization or operationalization of terms and many dimensions are missing granularity.

Insert Figure 1 here
Dimensions of Supply Chain Integration and Collaboration

Information sharing. We first suggested this as we discussed upstream and downstream integration. For example upstream integration identifies more operational information sharing

whereas, downstream identifies information sharing as more strategic. As mentioned previously, operational information sharing is measured by sharing of production plans (Frohlich and Westbrook, 2001; Devaraj et al., 2007; Kotzab et al., 2011; Wong et al., 2011), cost information sharing, (Das et al., 2006; Swink et al., 2007), sales forecasts and inventory status (Devaraj et al., 2007; Flynn et al., 2010; Kotzab et al., 2011; Wiengarten et al., 2012), point of sales information (Zhao et al., 2008; Flynn et al., 2010;) new ideas (Saeed et al., 2011), exchange operational information (Schoenherr and Swink, 2012; Sanders, 2008). Strategic information sharing is measured more by looking at the level of sharing of market information (Narasimhan and Kim, 2002; Zhao et al., 2008; Kim, 2009; Wong et al., 2011) and planning (Sanders, 2008; Wiengarten et al., 2012).

Interestingly, there are many other researchers who measure information sharing differently. For example some researches identify information sharing as just having a formal agreement to share information with suppliers and customers (Jayaram et al., 2010; Thun, 2010) Other researchers look at the willingness to share information among supply chain members (Richey et al., 2010; Thun, 2010; Fawcett et al., 2011). Some just identify that there is some sort of information exchange taking place, but do not identify what type of information (Skjoett-Larsen, et al., 2003; Singh and Power, 2009; Zacharia et al., 2009, Zacharia et al 2011). While others measure it by suggesting the all information that is being shared will be frequent, relevant, timely, accurate, and complete and that it will be held confidential (Nyaga et al., 2010; Allred et al., 2011; Fawcett et al., 2011; Cao and Zhang, 2011, Fawcett et al., 2012)

Shared resources. Shared resources is another dimension that is defined differently between researchers. Some authors define shared resources as financial assistance to supplier (Das et al., 2006; Saeed et al., 2011; Cao and Zhang, 2011). While others define it as the sharing of

inventory and capacity with a major customer (Zhao et al., 2008; Flynn et al., 2010, Zhao et al., 2011) Allred et al., (2011) look at how aggressively companies share resources to help suppliers improve their capabilities. Cao and Zhang (2011) define shared resources the most intricately. Their resource sharing dimension includes dedicated personnel, equipment, technical supports as well as financial and non-financial resources (Cao and Zhang, 2011).

Measurement Outcomes

As noted early in Table 1, the findings are mixed for the outcomes in supply chain integration and collaboration. Likewise, the outcomes chosen to be studied are mixed (see Table 5). Due to the complexity and interdependences of supply chain integration and collaboration, selecting the appropriate performance measures is challenging (Flynn et al., 2010). Some argue that financial performance should be the main measure of supply chain performance (Chen and Paulraj, 2004). A total of 18 papers used firm or financial performance as their final outcome. Of those 18, 83% of those outcomes were supported.

Others have claimed that there are limitations to relying solely on financial measures (Dixon et al., 1990; Eccles, and Pyburn, 1992; Hall, 1983; Johnson and Kaplan, 1987; Skinner, 1971). Operational performance measures include cost, quality, delivery, and flexibility. Operational performance was used both as an intermediate outcome and a final outcome. Both of which were supported statistically 77% of the time. For example Koufteros et al., (2005) found a weak effect of customer integration on quality and a non-statistically significant effect of supplier integration on quality. Where Villena et al., (2009) found a positive association between supply chain integration and operational performance.

Relational outcomes such as trust, credibility and relationship effectiveness are frequently viewed as antecedents to successful collaboration. Zacharia et al., (2011) suggest that these

dimensions are not inherent to a relationship, and that they develop over time based on experience. These relational outcomes are enhanced or diminished based on the strength of a firm's contribution to the collaboration effort (Zacharia et al., 2011). Relational outcomes were used as both intermediate outcomes and as final outcomes. They were supported 83% and 71% of the time respectively. Zacharia et al., (2011) specifically found that operational outcomes significantly lead to relational outcomes. However, Zhao et al., (2008) found that different types of power had mixed effects on relationship commitment.

Customer satisfaction was also used as both an intermediate and final outcome. As an intermediate outcome it was strongly supported both times. Allred et al., 2011, suggest that by improving resource configuration and adaptability, collaboration enhances process efficiency and customer satisfaction (Frohlich and Westbrook, 2001). In both of their time period studies, it shows that customer orientation is significantly related to satisfaction. In some cases, customer satisfaction is used to define the dimension of firm performance (Kim, 2009; Frohlich and Westbrook, 2001; Rosenzweig et al., 2003). In two of these cases, the findings were mixed. Nyaga et al., (2010) define satisfaction as an overall positive measure of evaluation of the aspect of a firm's working relationship with another firm. They find that in both their buyer and their supplier model that commitment significantly and positively affects satisfaction.

Theoretical Approaches Used

The practice of supply chain integration and collaboration is still an emerging field and academic domain (Storey et al., 2006) Theory is necessary to further scientific understanding by creating a systemized structure capable of both predicting and explaining phenomena (Hunt 1991). In order for the supply chain integration and collaboration discipline to progress and to be considered a mature discipline it must use and develop theory (Kuhn, 1962). In 2010, Defee et al.

conducted a research project to identify what theory-driven empirical research has occurred as a result of these calls. They found that approximately 53% of the sampled articles explicitly used theory.

The first articles to identify theory in supply chain integration and collaboration first show up in the early 2000s (See Table 6 Panel C). They are sporadic until 2005, but they really don't become common until about 2009. Of the theoretical determinants of supply chain management, much attention has been directed to the buyer-supplier dyadic relationship. Therefore, it is no surprise that in the current literature the "resourced-based view" (RBV) is used quite extensively as the theoretical foundation for research (see Table 6 Panel A). The other most prevalent theory used is transaction cost economics (TCE). Not surprisingly, these two theories have also been the most prevalent theories used in supply chain research (Defee et al., 2010). Table 6 compares the theories used in supply chain research to the theories used in supply chain integration and collaboration literature. Of the 43 integration and collaboration articles that were analyzed 14.6% used RBV and 13.3% used TCE compared to 10.4% for TCE and 8.6% for RBV in the supply chain research (see Table 6 Panel A). Further, an additional four more of the main theories used in supply chain integration and collaboration literature: contingency theory (9.3%), knowledge-based view (2.6%), social network theory (2.6%) and social exchange theory (2.6%), have been used in supply chain research.

Insert Table 6 here:
Theoretical Approaches in Supply Chain Collaboration/Integration Literature

The two theories, TCE and RBV not only inform different decisions, but they explain the drivers of integration and collaboration as well. In RBV resource considerations arise when collaborators decide how to create value. Decision makers determine how organization's

valuable, rare, inimitable and non-substitutable resources can be configured throughout the supply chain to achieve greater firm performance (Barney, 1991). On the other hand, TCE considerations arise when economic agents are looking for cost minimization activities (Coase, 1937; Williamson, 1985). Organizations invest in transaction-specific assets with other organizations to enhance commitment, reduce opportunistic behaviors, and lower transaction costs (Zhao et al., 2011).

Although the two theories inform different decisions, they have been used side by side in some of the supply chain integration and collaboration literature (see Table 6 Panel B). (Narasimhan and Kim, 2002, Das et al., 2006, Cao and Zhang, 2011). Narasimhan and Kim (2002) note that effective and efficient communication and coordination among the different functions between organizations play a role in successful diversification of a firm, thus implying the need for multiple theoretical foundations. TCE is also used in conjunction with social exchange theory (Zhao et al., 2008; Nyaga et al., 2010). Nyaga et al. (2010) argue that supply chain collaboration research should both examine economic-driven and relational mechanisms.

Contingency theory is also used frequently in the supply chain integration literature (Koufteros et al., 2005; Flynn et al., 2010; Thun, 2010; Wong et al., 2011; Terjesen et al., 2012) and is touched on in the collaboration literature (Fawcett et al., 2008; Singh and Power, 2009). Contingency theory argues that no method or theory can be applied in all cases (Lawrence and Lorsch, 1967; Thompson, 1967). Therefore there is not an ideal way to organize a company or design a supply chain (Scott and Cole, 2000; Flynn et al., 2010).

The relational view is used equally between the integration literature and the collaboration literature (Petersen et al., 2005; Villena, 2009; Zacharia et al., 2011; Devaraj et al., 2007; Cao and Zhang, 2011; Zacharia et al., 2011). The relational view posits that firm benefit from

systematically sharing valuable knowledge with the supply chain (Dyer and Singh, 1998). However, there is risk of information being shared with competitors. Relational theory suggests that both buyers and suppliers must make investments in an effort to improve joint performance outcomes (Cohen and Levinthal, 1990; Dyer and Singh, 1998). But time commitments, resources, people and effort on both parties represent significant investment (Osborn and Hagedoorn, 1997; Petersen et al., 2005).

The information processing theory is used solely in the supply chain integration literature (Rosenzweig et al., 2003; Swink et al., 2007; Narayanan et al., 2011; Wong et al., 2011; Schoenherr and Swink, 2012). Information processing theory in the supply chain literature is defined as the gathering of data, the transformation of data into information and the communication and storage of information (Galbraith, 1973). Narayanan et al., (2011) suggest that information processing theory sheds light on the information processing mechanisms and capabilities furnished in inter-organizational design and relationships. Wong et al., (2011) argue that based on organizational information processing theory firms need external integration to improve information processing capability. Information sharing will be examined further in the section discussing of the nature of the dimensions of supply chain integration and collaboration.

F. ORIENTING CONCEPTUAL FRAMEWORK: TWO PERSPECTIVES ON RELATIONAL STRATEGIES

This last section presents an orienting conceptual framework for further analysis on relational strategies (Thompson et al., 1994; Thompson, 1997; Woodside et al., 2005; Murray, 2002). The principal objective is to develop a conceptual research tool for achieving deeper sense-making of what happened and why it happened. It gives a framework for researchers to interpret meaning of the phenomenon of relational strategies and the dynamics of the interplay between etic and emic.

Traditionally, management practices fall into categories or traditions, from those traditions theories are developed. For example, theories such as RBV, relational view, and social exchange theory fall under the tradition of relational strategies. From theories, concepts are defined then dimensions are investigated through the use of measures. Figure 2 figuratively shows the progression of traditions to measures. The orienting conceptual framework on relational strategies developed in this paper specifically focuses on traditions, theories, and concepts. From the orienting conceptual framework meaning can then be interpreted.

See Figure 2
Orienting Conceptual Framework Focus

From the relational strategies literature, two perspectives and traditions emerge. This framework looks specifically at two approaches: 1) value appropriation approaches and 2) distinctive value co-creation approaches. While both of these approaches may have some overlapping operationalization, they also have some very distinct qualities.

See Figure 3
Relational Strategies Orienting Conceptual Framework

Value Appropriation Approaches

The first perspective is a value appropriation approaches. Supply chain integration and collaboration is viewed as a business process where supply chain partners work together toward common goals to reduce costs. Theories such as transaction cost economics (Williamson, 1979; Barringer and Harrison, 2000; Cao and Zhang, 2011) and resource dependence theory (Emerson, 1962; Pfeffer and Salancik, 1978) are very influential. Through these theories, decisions to use either vertical integration or market mechanisms depends on the relative monitoring costs that arise from uncertainties due to opportunism and partners' self-interest (Kaufmen et al., 2000; Cao and Zhang et al, 2011). From the perspective of TCE, integration and collaboration can be

viewed as an investment in a transaction-specific asset because it cannot be redeployed to a different partner if the original relationship is terminated (Zhao et al., 2008). Resource dependence theory suggests that collaboration at times is asymmetrical in power; organizations form relationships because of dependence upon another organization in order to succeed (Pfeffer and Salancik, 1978).

The concepts behind value appropriation approaches are strategic in nature and focus on contracts. For example, information sharing strategies would focus more on market strategies and planning (Narasimhan and Kim, 2002; Zhao et al., 2008; Kim, 2009; Wong et al., 2011; Sanders, 2008; Wiengarten et al., 2012). Problems facing manufacturing, such as parts shortage, delivery and quality problems and cost increases, are rooted in the lack of effective integration and collaborative strategies and are usually solved via short term fixes (Flynn et al., 2010; Rosenzweig et al., 2003). The relationships are “arms-length” and usually do not last over time (Fawcett and Magnan, 2002; Richey et al., 2010), meaning that alliances and partnerships are not formed. Further, these relationships may be asymmetrical in power and are inherently unstable (Lawler, 1986; Rubin and Brown, 1975).

Drivers behind value appropriation approaches suggest that when resources and competencies are not readily or sufficiently viable, firms are likely to establish ties with other organizations (Child and Faulner, 1998). Zhao et al., (2008) suggest that information sharing, synchronized planning, and working together with customers and suppliers to jointly resolve problems and facilitate operations are important drivers for collaboration between organizations (Zhao et al, 2008). The determinants of most value appropriation approaches are frequency of the interaction, specificity, environmental uncertainty, limited rationality, and opportunistic behavior (Williamson, 1981).

Distinctive Value Co-Creation Approaches

The second perspective, distinctive value co-creation approaches, concentrates on building close, long-term partnerships to accomplish mutual objectives. Supply chain members work together and share information, resources, and risks. Through relational theories such as resource-based view of the firm, firm performance can be explained by implementing strategic resources such as core competence, dynamic capabilities, and absorptive capacity (Barney, 1991; Pahalad and Hamel, 1990; Teece et al., 2007; Cohen and Levinthal, 1990). RBV argues that firms that develop valuable, inimitable, rare, and non-substitutable capabilities will outperform their competitors (Dierickx and Cool, 1989; Barney, 1991). Through value co-creative efforts, firms become more dyadic, focusing on a buyer/supplier relationship (Fawcett and Magnan, 2002), and organizations are able to develop a competitive advantage from relationships that are collaborative with alliance partners.

When looking for distinctive value co-creation approaches, researchers would identify concepts more relational in nature. The relational view suggests that exchange relationships occur when the partners invest in relation-specific assets, develop inter-firm knowledge sharing routines, use effective governance mechanisms, and exploit complementary capabilities (Dyer and Singh, 1998). These strategies would include such behaviors as investing in partner capabilities and process development and developing long-term relationships (Saeed et al., 2011; Flynn et al., 2010; Koufteros et al., 2007). Close contact would be maintained with strategic partners and satisfaction would be measured (Swink et al., 2007). All forms of resource sharing strategies would take place along with shared expertise and training (Nyaga et al., 2010; Allred et al., 2011; Saeed et al., 2011).

Distinctive value co-creation approaches suggest that most firms cannot develop all capabilities needed internally, this need drives organizations to develop relationships between partners that allow organizations to obtain these resources (Golicic and Mentzer, 2005). Relationships enable firms to take advantage of complementary assets and to reduce redundancy (Dyer and Singh, 1998). The more capabilities an organization needs, the more likely they are to look at building a closer relationship with the organization that can provide those capabilities (Golicic and Mentzer, 2005). Some of the drivers and determinants behind value co-creation approaches include the desire for trust, commitment to the relationship, complementary resources and capability development, relation-specific assets, knowledge sharing routines, and effective governance (Dyer and Singh, 1998).

G. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

To summarize, this paper conceptually contributes to the literature through an in-depth investigation of relational strategies, specifically looking at and integrating the integration/collaboration literature. Both of these literature streams investigate how two or more independent companies working closely together achieve greater success than can be attained in isolation (Simatupang and Sridharam, 2002; Daugherty et al., 2006). After giving a brief history of relational strategies, we delineate and summarize contrasting dimensions, theories, and measures researchers have used to explore supply chain relational strategies.

We found that there have been a wide variety of dimensions used to characterize the phenomenon of relational strategies. Researchers have looked at both internal and external dimensions of collaboration and integration. Further, researchers have investigated the phenomenon both upstream and downstream. Most of the literature was studied by looking at just one level of collaboration. However, there were a few articles that investigated multi-tier

integration and collaboration efforts. The top twenty dimensions of integration/collaboration were defined. The most common dimensions used are connectivity, frequent contacts and meetings, information sharing both strategic and operational, joint product development, joint process management, shared expertise and teaming.

Outcomes to supply chain integration and collaboration were also investigated. We found both the types of outcomes used and the actual findings of these outcomes to be mixed, indicating the complex nature and interdependencies the phenomenon. Finally we investigated the theories behind relational strategies, identifying the top 14 theories used, the most prevalent of those being RBV, TCE, Contingency Theory, and Relational View. Delineating these dimensions, theories and measure should help provide a better roadmap for future research in relational strategies.

The summary of the literature revealed novel insights into integration and collaboration and helped to develop an organizing conceptual framework that provides clear insight into future research development of relational strategies. The principal objective of the framework was to develop a conceptual research tool for achieving deeper sense-making of relational strategies. Specifically, this framework focuses on value appropriation and value co-creation approaches.

This framework can be used to help guide inductive research efforts giving direction to interview guides and help direct the analysis focus. It may also be used to better define empirical research efforts.

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I. FIGURES

Figure 1: Dimensions of Supply Chain Integration and Collaboration

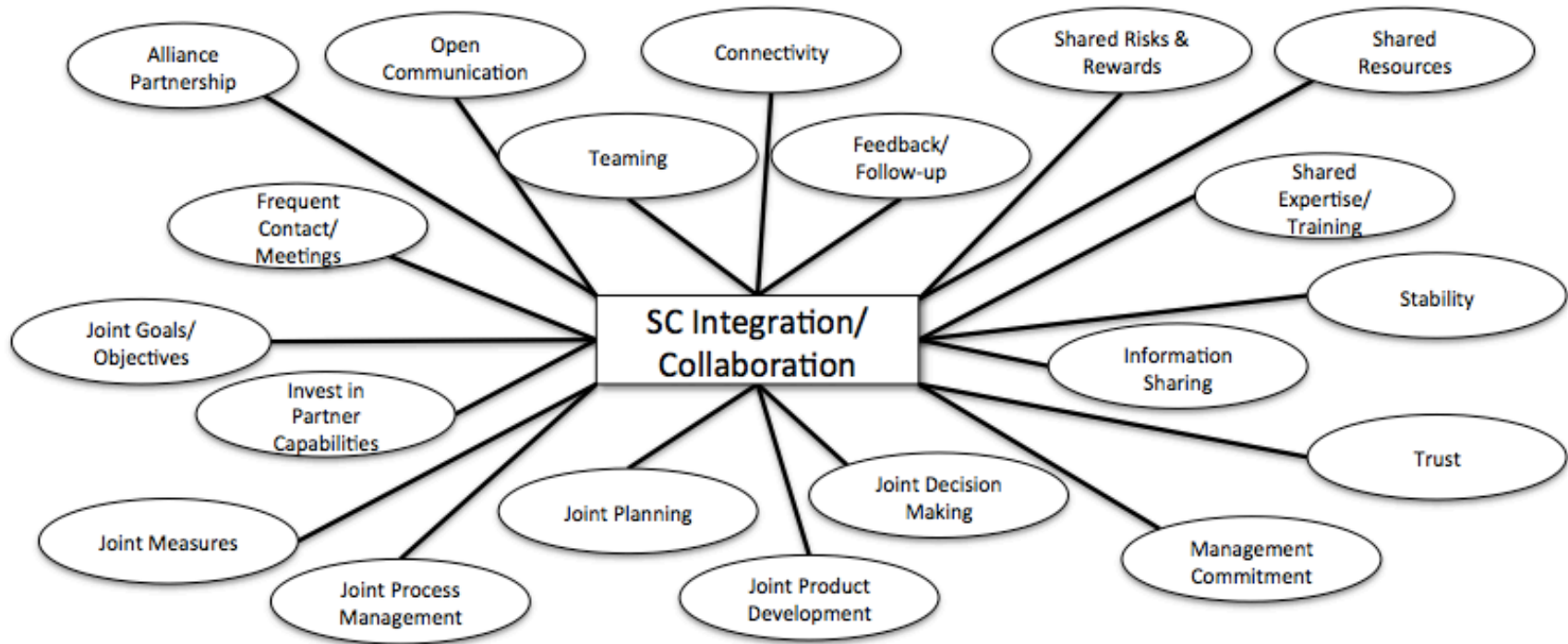


Figure 2: Orienting Conceptual Framework Focus

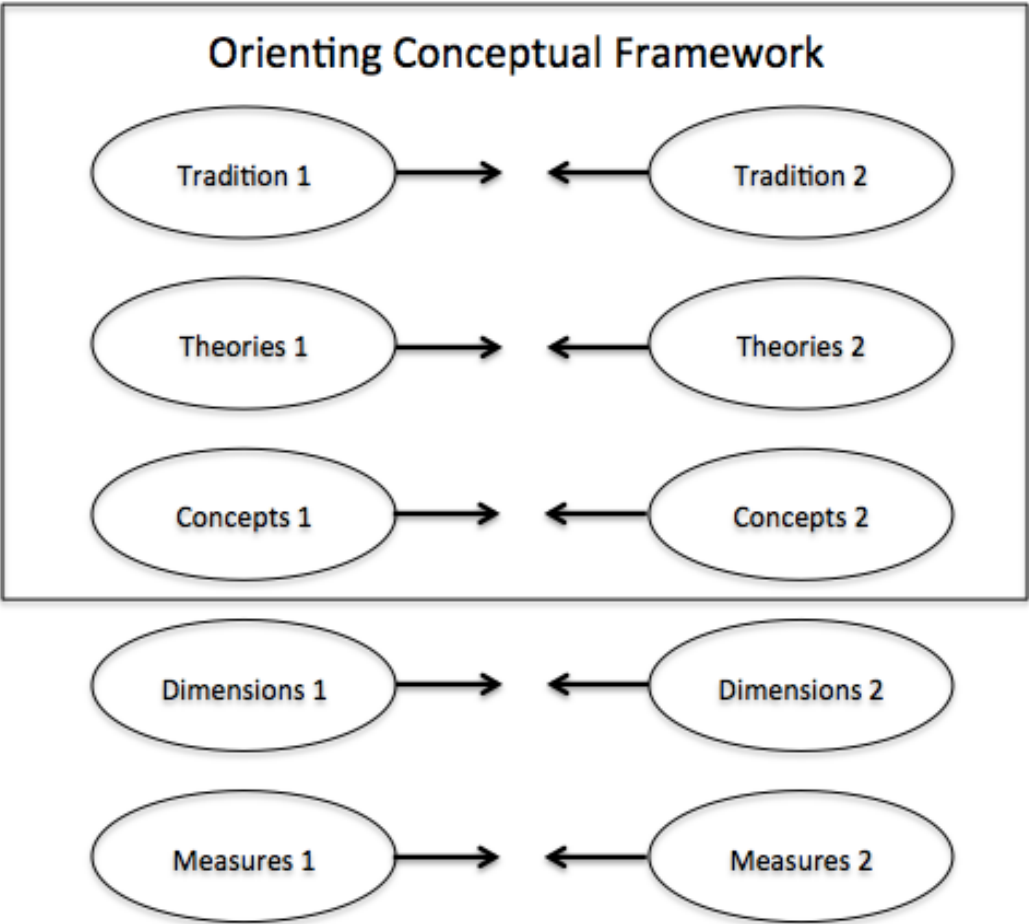
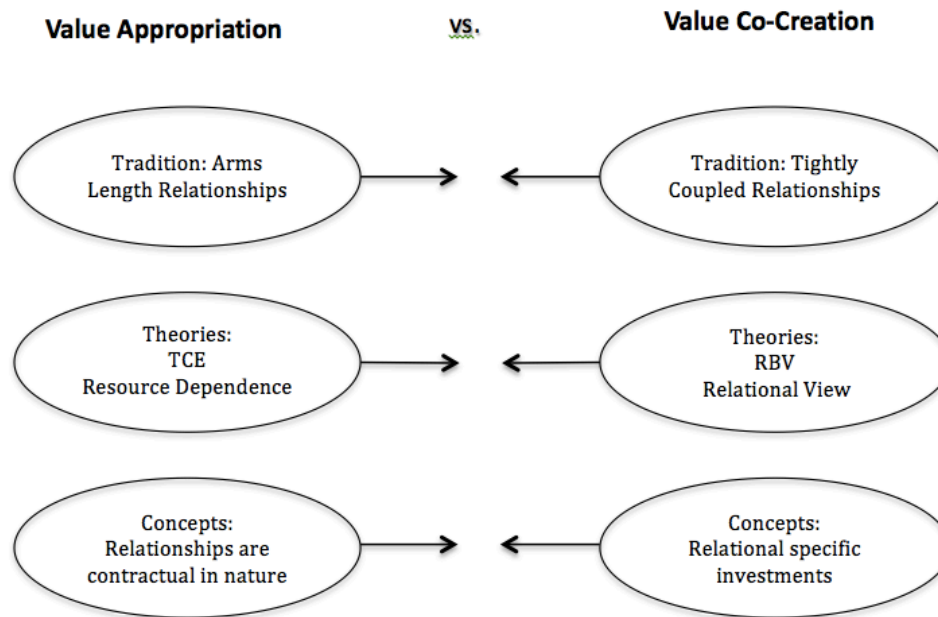


Figure 3: Relational Strategies Orienting Conceptual Framework



J. TABLES

Table 1: Exploring the Empirical Link between Tightly Coupled SC Relationships and Performance

Positive	Negative/None	Complex/Mixed
Degree of integration is positively associated with productivity and market share performance (Frohlich and Westbrook, 2001).	Executive risk bearing reduces willingness to make risky decisions and thus discourages supply chain integration (Villena et al., 2007).	Supplier selection decision will have an impact on the buying firm's ability to interact with the supplier effectively (Petersen et al., 2005).
The coordinated use of SC integration and diversification strategies has a significant effect on firm performance (Narasimhan and Kim).	Most companies do not align their IT implementation with their supply chain strategy (Thun, 2010).	There is a point of optimal level of integration. External integration cannot be pursued prior to internal (Das et al., 2006).
Supply chain integration is positively associated with competitive capabilities and business performance (Rosenzweig et al., 2003).	Supplier development and supplier partnership do not provide performance benefits in a given domain (Koufteros et al., 2012).	Only high levels of integration manifest statistically significant positive effects towards product innovation (Koufteros et al., 2007).
Firms that are interdependent in terms of knowledge and skills, and those who share a deep understanding of each other, will likely have a high level of collaboration (Zacharia et al., 2009).	Supply chain collaboration set up either internally or jointly play no significant role in changing the level of execution directly (Kotab et al., 2011).	Internal and customer integration were more strongly related to improving performance than supplier integration (Flynn et al., 2010).
Collaborative activities lead to trust and commitment, which in turn lead to improved satisfaction and performance (Nyaga et al., 2010).	Many companies struggle to achieve high levels of collaboration. Cultures change slowly, requiring managerial fortitude and vision. Missed goals are the most common result (Fawcett et al., 2008).	Some integration routines have a positive impact on product development outcomes and market success, while other routines can hamper the collective effort (Koufteros et al., 2010).
Collaboration, as a dynamic capability, mediates the conflict resulting from functional orientations, and improves performance (Allred et al., 2011).		Performance success is dependent upon the firm's readiness to intensify its supply chain relationships (Kotzab et al., 2011).
Collaboration improves collaborative advantage and has a bottom-line influence on firm performance (Cao and Zhang, 2011).		Both internal and external process integration partially mediate the impact of the antecedents on performance (Narayanan et al., 2011).
SCI-Performance linkage is positive. Environmental uncertainty strengthens SCI-Performance link (Wong et al., 2011).		The relationship between SC integration and operational performance is an inverse U suggesting costs to a high degree of internal and external integration (Terjesen et al., 2012).
Internal integration improves external integration, which directly and indirectly enhance company performance (Huo, 2012).		Strategic supplier integration is significantly linked to market performance, but not to customer satisfaction (Swink et al., 2007).
Internal integration strengthens the positive impacts of external integration on both delivery and flexibility performance (Schoenherr and Swink, 2012).		

Table 2: Supply Chain Integration and Collaboration Conceptualization, Theoretical Approaches, and Dimensions

Panel A: Supply Chain Integration Literature

Authors	Conceptualization	Theoretical Approach	Dimensions	Findings/Outcomes
Frohlich and Westbrook, 2001	The combination of forward physical flow of deliveries and backward coordinated flow of data.	Theory of “Performance Frontiers”	Supplier Integrative Activity	Integration is divided into inward, periphery, supplier, customer, and outward. Degree of integration is positively associated with productivity and market share performance.
Narasimhan and Kim, 2002	Supply chain strategies and practices that depend on the nature of the business, the competitive environment, and technological intensity of the product.	Resource-based View Transaction Cost Economics	Supplier integration Internal integration Customer integration Product diversification Internal market diversification	Supply chain integration strategies modify the relationships between diversification and performance. The coordinated use of SC integration and diversification strategies has a significant effect on firm performance.
Rosenzweig, Roth, and Dean, 2003	The relative external integration that is an expression of a firm's cross-business relationship upstream with suppliers and downstream with distributors and customers.	Information Processing Theory Transaction Cost Economics	Integration intensity Competitive capabilities	Supply chain integration is positively associated with competitive capabilities and business performance.
Koufteros, Vonderembse, and Jayaram, 2005	Customer integration involves determining customer requirements and tailoring internal activities to meet these requirements. Supplier integration may lead suppliers to operate as strategic collaborators. Product integration refers to the capability of organizations to introduce new products and features.	Contingency Theory Uncertainty Reduction Theory Organizational Theory	Internal Integration Customer Integration Product-Process Integration	Both internal and external integration positively influence product innovation and quality and ultimately, profitability. With respect to contingency effects, the results indicate that equivocality moderate the relationships between integration and performance.
Petersen, Handfield, and Ragatz, 2005	Early supplier integration is an important coordinating mechanism for decisions that link product design, process design, and supply design together.	Relational Theory	Supplier assessment Technical assessment Business assessment	Emphasize the criticality of the supplier selection decision when considering not only capabilities of the supplier, but also the culture of the supplier, which will have an impact on the buying

			Project team effectiveness	firm's ability to interact with the supplier effectively.
Das, Narasimhan, and Talluri, 2006	A state of synergy accomplished through a variety of integration practices among the supplier, purchasing and manufacturing constituents of an organization.	Resource-based View Transaction Cost Analysis Institutional Isomorphism Theory	External integration Internal integration	<ul style="list-style-type: none"> • Integration does not always result in improved performance • There is a point of optimal level of integration. • External integration cannot be pursued prior to internal.
Devaraj, Krajewski, and Wei, 2007	Production information integration shares the information between entities in a supply chain and are supported by the collaborative efforts that result in improved production information accuracy.	Resource-based View Relational View Theory of Swift and Even Flow	eBusiness capabilities Production information integration	eBusiness technologies support customer integration and supplier integration and firms have both forms of interaction.
Koufteros, Cheng, and Lai, 2007	Two basic forms of supplier involvement in product development are the gray-box and black-box approaches. Gray-box—the supplier and the customer work alongside each other. Black-box—implies that each company would concentrate on certain tasks and components.	Social Network Theory	Embeddedness with suppliers Supply base rationalization Supplier selection	Selecting suppliers based on their product development capabilities leads to higher levels of both gray-box and black-box integration. Only gray-box integration manifest statistically significant positive effects towards product innovation.
Swink, Narasimhan, and Wang, 2007	Four types of strategic of strategic integration which exist along vertical and horizontal dimensions: supplier integration, customer integration, product-process technology integration and corporate strategy integration	Strategic Fit Theory Information Processing Theory Knowledge-based View of Organizations	Types of Integration Competitive Capabilities	Each type of integration activity has unique benefits and detriments. Provide implications for manufacturing managers who seek to design integration policies and associated resource deployments.
Zhao, Huo, Flynn, Yeung, 2008	Consists of the integration of internal functions, as well as the integration with customers and suppliers.	Transaction Cost Theory Power-Relationship Commitment Theory	Power Relationship commitment Customer integration	Different types of customer power impact manufacturers' relationship commitment in different ways. Expert power referent power and reward power are important in improving manufacturers' normative relationship commitment, while reward power and coercive power enhance instrumental relationship

		Social Exchange Theory		commitment.
Handfield, Petersen, Cousins, Lawson, 2009	The ability to work with suppliers to integrate them into the product development and design, order management, and order fulfillment process, and to ensure timely communication of requirements and continuous improvement.	Corporate Entrepreneurship Theory	Supply market intelligence Supply management influence Cross-enterprise integration Supplier integration	Entrepreneurial behaviors contribute to integration within the firm and with suppliers, in order to drive performance improvement.
Kim 2009	Must span material and product flow from vendors to final consumers and encompass an array of different organizational entities, external, as well as internal.	Resourced-based View Resource Dependence Theory Competitive Progression Theory	Supplier integration Cross-functional integration Company integration	In the case of Korean firms, efficient supply chain integration may play more critical role for sustainable SCM competitiveness, while in Japanese firms, the close interrelationship between the level of SCM practices and competition capability may have more significant effect on SCM competitiveness.
Villena, Gomez-Mejia, and Revilla, 2009	Members who synchronize their processes and share relevant, updated information hoping to improve their performance	Agency Theory Relational View	Executive risk bearing Managerial risk taking	Employment and compensation systems that increases SCE risk bearing reduces the SCE's willingness to make risky decisions and thus discourages supply chain integration. Negative relationship becomes stronger under conditions of high environmental volatility.
Flynn, Huo, and Zhao, 2010	The degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organization processes	Contingency Theory	Supplier integration Internal integration Customer integration	SC integration is related to both operation and business performance. Internal and customer integration were more strongly related to improving performance than supplier integration
Jayaram, Tan, and Nachiappan, 2010	A construct that builds on Frohlich and Westbrook's (2001) 'arcs of integration.'	Coordination Theory	Communication and information sharing Inter-organizational decision making Proactive planning	SC managers should consider new integration practices while deciding on the appropriate level of supply chain integration and scope.
Koufteros, Rawski, and	Essentially represents a structural and relational characteristic of a given organization or between organization (Barki	Social Network Theory	Internal integration Customer	Some integration routines have a positive impact on product development outcomes and market success, while other routines can hamper the

Rupak, 2010	and Pinsonneault, 2005). Such a network can include suppliers, manufacturers, and customers.		integration Supplier integration On-time execution Glitches	collective effort.
Narasimhan, Swink, Viswanathan, 2010	A process by which an organization coordinates and deploys knowledge resources.	Knowledge-based View of Organizations	Product-process integration Strategic customer integration Strategic supplier integration	Extends the emerging theory of strategic value chain integration and provide guidance to manufacturing managers who wish to assemble strategic integration policies.
Richey, Roath, Whipple, and Fawcett, 2010	Occurs across supply chain partners and involves governing backward integration with first-tier suppliers, forward integration with first-tier customers, and/or complete forward and backward integration. Focuses on coordination and collaboration efforts that occur among supply chain members.	Force Field Theory Relational Governance Structures	Barriers to integration Facilitators to integration	Firms can improve performance under the governance of facilitators to integration despite barriers. SC integration is required when a company recognizes that it must develop and govern a healthy sense of independence and interdependence to achieve capabilities and performance.
Thun, 2010	The improvement of cooperative relationships with customers and suppliers	Contingency Theory	Supplier integration Customer integration Global Supply chain integration	Most companies do not align their IT implementation with their supply chain strategy. Refines an existing framework for the comparison different supply chain integration strategies.
Kotzab, Teller, Grant, and Sparks, 2011	The systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.	Economic Theory	Internal SCM conditions Joint or external SCM conditions Adoption of SCM-related processes Execution of SCM	SCM to performance's success is dependent upon the firm's readiness to intensify its supply chain relationships.
Narayanan, Jayaraman, Luo, Swaminathan, 2011	Is concerned with the overall coordination of business processes and activities across different units with the outsourced environment.	Information processing theory	End customer orientation Information technology Internal process	Both internal and external process integration partially mediate the impact of the antecedents on performance.

			integration External process integration	
Saeed, Malhorta, and Grover, 2011	Three-dimensional conceptualization of SCI: strategic, operational and financial	Coordination Theory Resource-based View	Application Integration Strategic Integration Operation integration Financial integration	Successful firms sequence the configuration of IOS characteristics toward effectively developing and supporting their supply chain capabilities.
Wong, Boonitt, and Wong, 2011	The strategic collaboration of both intra-organizational and inter-organizational processes	Contingency Theory Information Processing Theory	Internal integration Supplier integration Customer integration Environmental Uncertainty	<ul style="list-style-type: none"> • SCI is multidimensional • Environmental uncertainty strengthens SCI-Performance link • SCI-Performance linkage is positive
Zhao, Huo, Selen, and Yeung, 2011	Consists of the integration of internal functions, as well as the integration with customers and suppliers.	Transaction cost theory	Relationship commitment Internal integration Customer integration Supplier integration	For Chinese controlled companies there is a strong collectivism culture and more reliance on relationship “Guanxi”, which had a significant impact on external integration with suppliers and customers, which is a stark contrast to foreign controlled companies.
Guan and Rehme, 2012	Overall scope of different business activities in a supply chain brought under the management of a single company (Majumdar and Ramasway, 1994)	Transaction Cost Economics Theory of Industrial Dynamics	External factors to driving forces Vertical integration of distribution	The most important factor driving vertical integration of distribution were the demands of large retail chains and the manufacturer’s decisions to focus on developing it positioning strategy in the supply chain
Huo, 2012	Supply integration is reduced to three major dimensions: Internal integration, supplier integration and customer integration.	Resource-based View Organizational Capabilities	Supplier integration Internal integration Customer integration	Internal integration improves external integration, which directly and indirectly enhance company performance. Mediation explains inconsistent findings in past integration research
Koufteros, Vickery, and Droge, 2012	Encompasses supplier integration, customer integration and internal integration.	Resource-based View	Supplier selection Supplier development	Supplier development and supplier partnership do not provide performance benefits in a given domain. The nature of the resource selected is key to competitive advantage.

			Buyer product innovation capability	
Schoenherr and Swink, 2012	Consists of the three dimensions of supplier, customer and internal integration. Involves both inter-organization and intra-organization interfaces that facilitate coordination and the effective and efficient flows of information, material, money, and decisions, with the ultimate goal of maximizing customer value.	Information Processing Theory	Customer integration Supplier integration Internal Integration	Internal integration strengthens the positive impacts of external integration on both delivery and flexibility performance. Extends the work of Frohlich and Westbrook.
Terjesen, Patel, and Sanders, 2012	The degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organization processes (Flynn et al., 2010).	Contingency Theory	Supplier integration Customer integration Internal integration Environmental uncertainty	The relationship between SC integration and operational performance is an inverse U suggesting costs to a high degree of internal and external integration.

Panel B: Supply Chain Collaboration Literature

Authors	Conceptualization	Theoretical Approach	Dimensions	Findings/Outcomes
Skjoett-Larsen, Therno, Andresen, 2003	Collaboration where two or more parties in the supply chain jointly plan a number of promotional activities and work out synchronized forecasts, on the basis of which the production and replenishment processes are determined.	Governance Structures Transaction Costs Economics	Shared information Degree of discussion Co-ordination/synchronization Competence development Evaluation Type of relationship	Successful implementation requires that the company abandons the classical functionally divided organization based on a production-oriented vision and become more market-oriented focusing on relations and processes.
Whipple and Russell, 2007	Two or more independent firms jointly working to align their supply chain processes so as to create value to end customers and	Grounded Theory Building	Collaborative transaction mgmt.	A typology of three types of collaborative approaches is proposed: collaborative transaction management, collaborative event management,

	stakeholders with greater success than acting alone. (Simatupang and Sridharam, 2002)		Collaborative event management Collaborative process management	and collaborative process management.
Fawcett, Magnan, and McCarter, 2008	The ability to work across organizational boundaries to build and manage unique value-added processes to better meet customer needs.	Contingency theory Force Field Theory	Driving forces Strategic management initiatives Implementation resisting forces	Competitive rules are changing the competitive bar—performance hinges on the ability to achieve high levels of collaboration Systemic cultural and structural changes are required to create more collaborative supply chains.
Sanders, 2008	Information sharing between supply chain partners to achieve joint benefits (Chopra and Meindl, 2007)	Organizational Learning Transaction Cost Theory	Information Technology Operational Coordination Strategic Coordination	To achieve a complete set of benefits, suppliers must ultimately use IT for both exploration and exploitation. Provide a deeper understanding of the mechanism of how the pattern of IT use can result in comprehensive set of organizational benefits for supplier firms.
Co and Barro, 2009	Supplier coordination and supplier integration through strategic partnerships will have a lasting effect on competitiveness of the entire supply chain.	Stakeholder Theory Field Theory	Aggressive strategies Cooperative strategies	Aggressive strategies feature some form of forceful attitude or behavior toward stakeholders in an attempt to alter other stakeholders' behavior. Organizations adopting cooperative strategies are willing to change the organizations' own behaviors or the other stakeholders' views, rather than forcing their demands on stakeholders.
Singh and Power, 2009	Connotes a higher magnitude between or among firms while coordination and cooperation are lower levels of relationship magnitude. (Golicic et al., 2003)	Resource-Based View Contingency Theory Institutional Theory	Customer relationship Supplier involvement	Model for how firms realistically and meaningfully pursue collaborative relationships with multiple trading partners beyond a one to one dyadic focus. Model provides opportunities to build on theoretical base.
Zacharia, Nix, and Lusch, 2009	Approach to managing interdependencies requiring a pooling of knowledge and a much higher level of joint decision-making, information sharing, and joint goal-setting	Relational View Resource-Based View	Interdependence of Knowledge and Processes	Firms that are interdependent in terms of knowledge and skills, and those who share a deep understanding of each other, will likely have a high level of collaboration.

	aimed at enhancing both shared and individual goals.		Collaboration level Supply Chain Partner Insight	
Nyaga, Whipple, and Lynch, 2010	Two or more independent firms jointly working to align their supply chain processes so as to create value to end customers and stakeholders with greater success than acting alone. (Simatupang and Sridharam, 2002)	Transaction Cost Economics Social Exchange Theory	Information sharing Joint relationship effort Dedicated investments Commitment Trust	Collaborative activities, such as information sharing, joint relationship effort, and dedicated investments lead to trust and commitment, which in turn lead to improved satisfaction and performance.
Allred, Fawcett, Wallin, and Magnan, 2011	Collaboration skills reduce counterproductive behavior by promoting goal alignment, more frequent and open information sharing, higher levels of managerial interaction, the exchange of expertise and resources and a willingness to share risk and rewards.	Resource-based View Organizational Capabilities	Orientations: Customer vs. Supplier External and Internal Collaboration	Collaboration, as a dynamic capability, mediates the conflict resulting from functional orientations, and improves organizational performance.
Cao and Zhang, 2011	Process focus: Collaboration has been viewed as a business process whereby two or more supply chain partners work together toward common goals Relationships focus: Formation of close, long-term partnerships where supply chain member work together and share information, resources, and risk to accomplish mutual objectives.	Transaction Cost Economics Resource-based View Relational View	Information sharing Goal congruence Decision synchronization Incentive alignment Resource sharing Collaborative communication Joint knowledge sharing	Collaboration improves collaborative advantage and has a bottom-line influence on firm performance, and collaborative advantage is an intermediate variable that enables supply chain partners to achieve synergies and create superior performance.
Fawcett, Allred, Fawcett, and Magnan, 2011	SC collaboration, as a dynamic capability, shifts and leverages SC resources to rapidly respond to changing environments and sustain high performance outcomes.	Dynamic Capabilities Resource-advantage Theory	Information sharing culture SC connectivity Supply chain collaboration	Investments in IT make their competitive contribution when they enable a dynamic SC collaboration capability, which provides valuable insight to guide IT investments designed to improve SC performance

Zacharia, Nix, and Lusch, 2011	Mechanism to combine and deploy external and internal knowledge and skills.	Relational View	Perceived interdependence Collaborative engagement Collaborative process competence Absorptive capacity	Collaborative process competence mediates the relationship between absorptive capacity and collaborative engagement, and positively influences both operational and relational outcomes.
Fawcett, Fawcett, Watson, and Magnan, 2012	A vital dynamic capability that delivers differential firm performance	Systems Design Force Field Analysis	Collaborative capability Resistors to a collaboration capability Enablers of collaboration capability	Key to collaboration is to understand and manage effectively the change management process. High levels of commitment and buy-in break the conflict and tension imposed by resisting forces.
Wiengarten, Humphreys, McKittrick, and Fynes, 2012	Two or more independent firms jointly working to align their supply chain processes so as to create value to end customers and stakeholders with greater success than acting alone. (Simatupang and Sridharam, 2002)	Transaction Cost Economics	Interaction applications Coordination applications Integration applications Information sharing	Provides justification for the modeling of E-business in multiple dimensions. By selecting the most appropriate e-business applications, operations improvement benefits can be realized across a range of operational metrics due to enhanced supply chain collaboration.

Table 3: External Only vs. External and Internal Papers

External	External and Internal
Frohlich and Westbrook, 2001	Narasimhan and Kim, 2002
<i>Skjoett-Larsen et al., 2003</i>	Rosenzweig et al., 2003
Petersen et al., 2005	Koufteros et al., 2005
Devaraj et al., 2007	Das et al., 2006
Koufteros et al., 2007	Swink et al., 2007
<i>Whipple and Russell, 2007</i>	Handfield et al., 2009
<i>Fawcett et al., 2008</i>	Kim, 2009
<i>Sanders, 2008</i>	Flynn et al., 2010
Zhao et al., 2008	Jayaram et al., 2010
<i>Co and Barro, 2009</i>	Koufteros et al., 2010
<i>Singh and Power, 2009</i>	<i>Allred et al., 2011</i>
Villena et al., 2009	Kotzab et al., 2011
<i>Zacharia et al., 2009</i>	Narayanan et al., 2011
Narasimhan et al., 2010	Wong et al., 2011
<i>Nyaga et al., 2010</i>	Zhao et al., 2011
Richey et al., 2010	Huo, 2012
Thun, 2010	Schoenherr and Swink, 2012
<i>Cao and Zhang, 2011</i>	Terjesen et al., 2012
<i>Fawcett et al., 2011</i>	
Saeed et al., 2011	
<i>Zacharia et al., 2011</i>	
Guan and Rehme, 2012	
<i>Fawcett et al., 2012</i>	
Koufteros et al., 2012	
<i>Wiengarten et al., 2012</i>	

Note: Italicized articles are from collaboration literature.
 Non-italicized articles are from integration literature

Table 4: Dimensions used in External/Internal and Upstream/Downstream SC Integration/Collaboration Literature

External-not specified 12 articles	External-Downstream 16 articles	External-Upstream 27 articles	Internal 17 articles
Information Sharing – 9	Connectivity – 9	Information Sharing (Operational) – 14	Connectivity – 9
Frequent Contacts/Meetings – 8	Information Sharing (Strategic) – 8	Joint Product Development – 14	Teaming – 7
Joint Goals/Objectives – 7	Frequent Contacts/Meeting – 8	Connectivity – 12	Frequent Contacts/Meetings – 6
Shared Expertise – 5	Feedback – 7	Alliances/Partnerships – 10	Joint Product Development – 5
Teaming – 5	Information Sharing (Operational) – 5	Process Management – 9	Information Sharing (Operational) – 3
Connectivity – 4		Invest in Partner Capabilities – 7	Shared Expertise – 3
Joint Measures – 4		Shared Expertise – 5	
Joint Planning – 4		Stability – 5	
Alliances/Partnerships – 4		Joint Planning – 4	
Shared Risks and Rewards – 4			

Table 5: Outcomes Studied in SC Integration/Collaboration Literature

Outcome	Intermediate	% supported	Final	% supported
Financial/Firm			18	83%
Operational	9	77%	13	77%
Relational	6	83%	7	71%
Satisfaction	2	100%	5	60%
Innovation	2	0%	1	0%
Execution	1	0%	1	0%

Table 6: Theoretical Approaches in Supply Chain Collaboration/Integration Literature

Panel A: Comparison of Theoretical Incidents: Total Supply Chain Literature (Defee et al., 2010) vs. Supply Chain Collaboration/Integration Literature

Supply Chain Literature Top 14 Theories 364 articles/ 568 theoretical incidents	% of theoretical incidents	Supply Chain Collaboration/Integration Literature Top 14 Theories 43 articles/ 75 theoretical incidents	% of theoretical incidents
TCE	10.4	RBV	14.6
RBV	8.6	TCE	13.3
Porter's framework	3.0	Contingency Theory	9.3
Contingency Theory	2.5	Relational View Theory	8.0
Resource Dependence Theory	2.5	Information Processing Theory	6.6
Bullwhip Effect	2.3	Organizational Theory	5.3
Agency Theory	1.9	Force Field Theory	5.3
Social Exchange Theory	1.9	Coordination theory	4.0
Game Theory	1.8	Knowledge-based View	2.6
Core Competency Theory	1.6	Social Network Theory	2.6
General Systems Theory	1.6	Institutional Isomorphism Theory	2.6
Social Network Theory	1.6	Relational Governance Structures	2.6
General Inventory Theory	1.4	Resource Dependence Theory	2.6
Relationship Marketing	1.4	Social Exchange Theory	2.6

Panel B: Comparison of Theoretical Incidents: Supply Chain Collaboration vs. Supply Chain Integration Literature

Theories Used	% of theoretical incidents in Integration Literature 29 articles/48 incidents	% of theoretical incidents in Collaboration Literature 14 articles/27 incidents
RBV	9.3	5.3
TCE	6.7	6.7
Contingency Theory	6.7	2.7
Relational View Theory	4.0	4.0
Information Processing Theory	6.7	0.0
Organizational Theory	2.7	2.7
Force Field Theory	1.3	4.0
Coordination theory	2.7	1.3
Knowledge-based View	2.7	0.0
Social Network Theory	2.7	0.0
Institutional Isomorphism Theory	1.3	1.3
Relational Governance Structures	1.3	1.3
Resource Dependence Theory	1.3	1.3
Social Exchange Theory	1.3	1.3

Panel C: Total Number of Theoretical Incidents by Time Period

Theories Used	2001-2004			2005-2008			2009-2012		
	Collaboration	Integration	Total	Collaboration	Integration	Total	Collaboration	Integration	Total
RBV	0	1	1	0	2	2	4	4	8
TCE	1	1	2	1	2	3	3	2	5
Contingency Theory	0	0	0	1	1	2	1	4	5
Relational View Theory	0	0	0	0	2	2	3	1	4
Information Processing Theory	0	1	1	0	1	1	0	3	3
Organizational Theory	0	0	0	1	1	2	1	1	2
Force Field Theory	0	0	0	1	0	1	2	1	3
Coordination theory	0	0	0	0	0	0	0	2	2
Knowledge-based View	0	0	0	0	1	1	0	1	1
Social Network Theory	0	0	0	0	1	1	0	1	1
Institutional Theory	0	0	0	0	1	1	1	0	1
Governance Structures	1	0	1	0	0	0	0	1	1
Resource Dependence Theory	0	0	0	0	0	0	1	1	2
Social Exchange Theory	0	0	0	0	1	1	1	0	1
Total	2	3	5	3	13	16	17	22	39

III. ESSAY 2: ADVANCING HERMENEUTIC RESEARCH FOR INTERPRETING SUPPLY CHAIN STRATEGIES

A. ABSTRACT

This article focuses on the ontological and epistemological aspects of hermeneutics—a leading interpretive research genre making a presence in the management fields. While qualitative/interpretive research is not completely new to the supply chain field, the methodologies used have been limited. This article gives a brief overview of the current state of qualitative/interpretive research and introduces the need for a hermeneutic approach. Further, the historical evolution of contemporary hermeneutics is discussed, clarifying the hermeneutic ‘Circle of Understanding.’ Finally, some methodological guidelines and examples for employing hermeneutics in supply chain research will be clarified.

B. INTRODUCTION

Since World War II, developments in practice and in academic research have substantially advanced knowledge in the field of supply chain management (Singhal and Singhal, 2012). The competitive landscape in today’s global supply chains are still evolving and changing, becoming even more complex and nuanced (Sanders and Wagner, 2011). Therefore, supply chain research is also changing. Fawcett and Waller (2011) suggest that the easy questions have been answered and that we need to reevaluate our approach to better solve tomorrow’s challenges. Therefore, a need for more theory driven and rigorous research to find and answer the difficult and hidden connections in supply chain management is needed. (Carter, 2011; Fawcett and Waller, 2011).

There are many approaches to help solve this issue, with qualitative research being one of the solutions that has been approached over the last decade. Supply chain researchers may choose from among several interpretive and qualitative approaches in investigating supply chain related

phenomena. However, current research in the supply chain field has been limited for the most part to general case study and grounded theory methodologies. Other approaches are needed to expand the toolbox of qualitative research that will ask different kinds of questions and help lead to further understanding (Kaufmann and Denk, 2011). This article seeks to promote the use of hermeneutics—an interpretive/qualitative methodology for supply chain researchers, and to analyze the key axiological, epistemological, and ontological aspects of this methodology.

With the current interest in interpretive research in organizational research, hermeneutics has made its presence in such diverse management fields such as information systems, accounting, marketing, and organizational studies (Hirschman, 1990; Thompson, et al., 1990; Phillips and Brown, 1993; Thompson, 1997; Butler, 1988; Standing and Standing, 1999; Murray, 2002; Woodside et al., 2005; Verganti and Oberg, 2013). Despite the fact that hermeneutic research is used in other disciplines, this methodology has only shown up briefly in supply chain research (Flint et al., 2005). Further, hermeneutics as an approach for scholarly organizational research remains under examined. This article proposes to address this gap in our current literature on a number of important epistemological issues relating to the use of hermeneutics.

The first section of this article will present a brief overview of the current state of qualitative/interpretive research in the supply chain field. We will discuss the most prevalent methodologies being used and introduce the need for a hermeneutic approach. We will then describe the historical evolution of contemporary hermeneutics, finishing with how it is used in organizational research. Next a clarification of the hermeneutic ‘Circle of Understanding’ will be discussed. Finally, some methodological guidelines for employing hermeneutics in supply chain research will be explained.

C. REVIEW OF THE CURRENT STATE OF QUALITATIVE/INTERPRETIVE RESEARCH IN THE SUPPLY CHAIN FIELD

Historically, qualitative work has accounted for approximately 10 to 20 percent of supply chain research (Gupta et al., 2006; Carter and Ellram, 2003; Frankel et al., 2005; Sachan and Datta, 2005). For example, within the journal of *Production and Operations Management Society*, case studies have been primarily used for providing evidence (46.4%) followed by applications (32.1%) (Gupta et al., 2006). Qualitative research is primarily used for theory verifying (52.9%) followed by providing evidence (20.6%) (Gupta et al., 2006). Traditionally, the two major approaches that have been used for theory building are survey research (40.9%) and qualitative research (27.3%) (Gupta et al., 2006). We find similar for theory verifying research; survey research accounts for the majority of the research (43.8%) followed by qualitative research (22.5%) (Gupta et al., 2006). This gives evidence to the fact that qualitative research is gaining acceptance in building and verifying theory in the supply chain literature.

To develop a better understanding of the current state of supply chain literature with respect to qualitative work, a literature search was completed for this study. The goal of this search was to identify a representative sample of studies that use qualitative methods by searching the words “qualitative,” “interview,” “interpretive,” and “case study”. Since the goal was to review the current state of excellent, qualitative articles we limited the study to the last five years and to the top 5 supply chain journals in the field: Decision Sciences, JOM, POMS, JSCM and JBL. Given these restrictions, 37 articles were found for analysis.

Of the 37 articles that were studied, 30 of them indicated that they were some form of case study, either single or multiple. These case studies ranged from investigating single industries such as automotive and consumer electronics, to looking at multiple industries. Almost all of the interviews were conducted using a semi-structured interview guide with either face-to-face or

over the telephone interviews. Number of interviews ranged from 8 to 157 with the average number of interviews being 40. The length of interviews ranged from 45 minutes to 4-6 hours.

All but two of the case studies used some form of inter-rater reliability iterative coding, investigating within case and cross case (Lobiondo-Wood and Haber, 2002; Miles and Huberman, 1994; Eisenhardt, 1989; Yin, 1994; Meredith, 1998; Stuart et al., 2002; Glaser and Strauss, 1967; Corbin and Strauss, 1990; Cousins and Menguc, 2006; Strauss and Corbin, 1990; Ellram 1996; Eisenhardt and Graebner, 2007). As is common with qualitative case study research, supporting documents were also coded and used in half of the papers. Supporting documents such as presentations, performance data, annual reports, etc., help to provide further insight into the phenomenon. Findings from these studies varied from the development of propositions, models and frameworks to finding links within the literature to the extension of theory. Seven of the 30 case studies used some form of quantitative measures along with the coded qualitative interviews. In these articles the qualitative methods were used to contextualize the survey findings.

Five of the 37 articles used a formal grounded theory methodology. With grounded theory research, no prior theories are used. Instead, the data is used to allow new theories to emerge (Charmas, 2006). These articles for the most part used the formal open, axial, and selective coding for the coding of the data (Glaser and Strauss, 1967; Strauss, 1987; Strauss and Corbin, 1990; Charmaz, 2006). From these five articles, new theory emerged, proposition and frameworks were developed, and new dimensions emerged from the data.

From this research we find that case study and grounded theory has been a wonderful door-opener for qualitative work in the SC field. However, grounded theory focuses on coding and sometimes misses meaning. Now that the groundwork has been laid out for qualitative and

interpretive supply chain research, our next opportunity is to begin to expand the toolbox and begin to ask different questions to find answers that we may be missing in supply chain research. There is a need for an in-depth analysis, and hermeneutics as an interpretive research approach uses axiological, epistemological and ontological considerations to iteratively review phenomenon and theory that can help find the answer to these questions.

D. HISTORICAL EVOLUTION OF CONTEMPORARY HERMENEUTICS

Historically, the term hermeneutics can be traced back to Aristotle's *Peri hermeneias* and Hermes, the Greek messenger god (Weininger, 1999; Prasad, 2002). Hermes was able to understand and interpret what the gods had to say to humans. Broadly defined, hermeneutics is the art of understanding and the theory of interpretation. This definition is derived from two definitions combined. Hermeneutics can be described as the working out of the tension between the technical, theoretical task of interpretation and the art of understanding texts, historical periods, and other people (Weininger, 1999).

Over time, as a result of its extended association with biblical analysis and commentary, the term hermeneutics became compatible with the process of biblical interpretations (Prasad, 2002). The rejection of the church's authoritative provision of meaning to scripture during the Reformation period in favor of conviction about the self-sufficiency of the text, naturally called for an interpretive process (Weininger, 1999). Over time, hermeneutics became much more than a theoretical enterprise (Prasad, 2002). Work from researchers such as Friedrich Schleiermacher, Wilhelm Dilthey, and Martin Heidegger, created a major turning point in hermeneutics (Weininger, 1999). They synthesized the trends in various approaches, and laid the groundwork for future research (Weininger, 1999). Through their research, hermeneutics has evolved and

hermeneutic variations such as juridical hermeneutics, philological hermeneutics, and phenomenological hermeneutics emerged (Prasad, 2002; Boland, 1985).

In the mid-1980s the hermeneutic method began to appear in a variety of management sub-disciplines and has been used as a qualitative method throughout the next 20 years (e.g. Aredal, 1986; Boland, 1989; Thompson et al., 1990; Gabriel, 1991; Phillips and Brown, 1993; Thompson, 1997; Lee, 1994; Parker and Roffey, 1997; Standing and Standing, 1998; Murray, 2002; Woodside et al., 2005; Verganti and Oberg, 2013). In general, hermeneutic research is developing and can be found along the continuum from very weakly used to a more precise fashion that engages in a more comprehensive understanding of interpreting texts (Prasad, 2002). From investigation of these disciplines that use hermeneutics, there seems to be a need for an in-depth analysis of the epistemological, axiological, and ontological considerations involved in the use of hermeneutics as an interpretive research approach in organizational supply chain research.

E. THE HERMENEUTIC “CIRCLE OF UNDERSTANDING”

The most basic principle of hermeneutics is the understanding of a circular structure (Butler, 1998). Heidegger (1962) developed the concept of the “hermeneutic circle” to help the researcher picture a “whole” in terms that was made up by the experience of the individual “parts”. Understanding was developed on the basis of fore-structures of understanding that allow external phenomenon to be interpreted. Understanding the component phenomena begins only when the relationships to the whole has been determined (Butler, 1998). Through a dialectic process, the parts will be identified, and then operating from a holistic perspective, each part will be interpreted and its meaning and relationship to the ‘whole’ will be consolidated into an emergent understanding.

Gadamer (1993) further developed this concept as he reconceptualized the hermeneutic circle as an iterative process through which a new understanding of a whole reality is developed by means of exploring the detail of the existing phenomenon. Ricoeur (1981) concurred that the “circle of understanding” runs from understanding to explanation and back again. However, he argued that the movement from explanation to understanding is dialectical in nature; therefore, a structural model of explanation is needed to integrate the ‘parts’ into the ‘whole’ (Ricoeur, 1981). This model relies on some form of structural analysis that provides the explanatory procedure, which releases a dynamic meaning to facilitate an understanding of the phenomenon (Butler, 1998).

Researchers who use the hermeneutic method, point out that the procedural process of interpreting text is just an application of the method (Gadamer, 1993). In other words, the methods used to formulate meaning are rooted within a framework of core assumptions—an orienting conceptual framework. These assumptions or frameworks are based on a three-level definition 1) a general worldview, 2) the metaphorically structured theoretical models that derive from the general world view, and 3) specific procedures for implementing the worldview/theories (Morgan, 1980; Thompson, 1997). From this orienting conceptual framework, the interplay between etic and emic begin.

F. METHODOLOGICAL GUIDELINES FOR ORGANIZATIONAL SUPPLY CHAIN HERMENEUTIC RESEARCH

Hermeneutics today is no longer seen as a narrowly defined method, however, there are still a number of important method-related guidelines for organizational and supply chain researchers to follow (Prasad, 2002).

Select a Context

An important methodological consideration for organizational hermeneutic research is the context. According to Prasad (2002), when choosing a context, two points need to be kept in mind: 1) that in a research situation, the context is not a simple given, but needs to be actively defined by the researcher, and 2) that the context can usually be defined at different levels of comprehensiveness. The higher the level at which we define the context, the more comprehensive our understanding of the text will be.

Develop an Orienting Conceptual Framework

The notion of the hermeneutic circle suggests that a researcher's comprehension of the phenomenon at hand revolves around an initiating frame of reference (Thompson, 1997; Prasad, 2002). Thompson (1997) indicates that the quality of the research findings is contingent upon the scope of the background knowledge that the researcher has and the ability to forge insightful linkages between the background knowledge and the texts at hand. Therefore, this step in the hermeneutic investigation is an examination of the historical, cultural and theoretical considerations relevant to the topic. Hermeneutic inquiry requires the researcher to develop a thorough understanding with the historical aspects of the phenomenon of interest (Prasad, 2002; Thompson, 1997).

Theorists across many varied social and psychology fields suggest that human understanding is organized in terms of culturally shared narrative forms or traditions (Thompson, 1997). From these traditions, theoretical perspectives are drawn from the narrative structuring of identity and themes (Bruner, 1986; Crites, 1986; Gergen and Gergen, 1986; Hermans, 1996; Polkinghorne, 1988). In organizational research, researchers develop a conceptual framework, which enables them to understand and account for the text and bridges the various perspectives in the literature

(Young and Collin, 1988). The orienting conceptual framework gives the researcher a starting point for both the intra- and inter-textual analysis.

*See Figure 1:
Orienting Conceptual Framework Focus*

Capturing the Experience and Generating the Text

According to Prasad (2002), the scope of hermeneutics is no longer seen as being confined merely to interpreting texts. Ricour (1981) argued that human action in general can be considered text. Contemporary hermeneutic thought has expanded the meaning of the term text to include organizational practices, social and economic structures, culture patterns and artifacts (Prasad, 2002). As a result of this figurative transformation of the word “text”, the methods involved in hermeneutics research when applied to organizational and supply chain research is considerably enlarged.

In organizational supply chain research hermeneutics is based on the “texts” of managerial stories and practices. To develop the texts, phenomenological or long interviews are particularly well suited for hermeneutical analysis (Kvale, 1983; Thompson et al., 1989; McCracken, 1988). These interviews are primarily unstructured and allow for the interviewee to tell the story. The course of the interview dialogue emerges in relation to the characteristics of the experiences and meanings expressed by the participant (Thompson, 1997)

The stories participants tell about their everyday practices and experiences create a temporal trajectory in which a past event is relived in relation to present concerns and projected toward an envisioned future (Thompson, 1997). The temporal ordering creates relationships between a participant’s contemporary understanding, the historical context, and a broader field of

historically established meanings. These stories organize the multiple contexts of experiences into a coherent narrative of identity.

According to Thompson (1997), there are five key aspects to developing the textual data or narrative for hermeneutic analysis. First, the narratives are structured by plot lines that organize the events and characters in terms of goals and motives (Ricoeur, 1981). Second, they reflect symbolic parallels among the meanings of different actions (Barthes, 1974). Third, they present inter-textual relationships in which meanings invoked through the different stories become integrated in their narratives (Polkinghorne, 1988). Fourth, they express existential themes by which conceptions are negotiated through reflections of experiences and practices (Mick and Buhl, 1992; Thompson et al., 1990). Fifth, they draw from the cultural code of shared meanings and conventionalized viewpoints (Holt, 1997; O'Guinn and Shrum, 1997; Thompson et al., 1994).

Intra-textual Analysis

A typical characteristic of hermeneutically oriented research is that the interpretation of textual data moves from part to whole in an iterative fashion (Thompson, 1997). The researcher begins the cycle with an intra-textual analysis, which requires reading the entire text through the perspective of the orienting conceptual framework. This allows the research to begin to make sense of and gain an understanding of the story being told (Giorgi, 1989). Each interview is used as an n of 1 and is read over and over until an integrating theme emerges. The theme is used to organize the temporal sequencing of key events and focuses the description of narrative movement (Thompson, 1997). Each interview is re-written to tell the story of that informant.

Inter-textual Analysis and Dialectical Tacking

The second part-to-whole movement is a shift from the interviews to the stories as an inter-textual analysis emerges. The researcher looks for patterns and differences across different story lines (Thompson, 1997). There is an interactive movement between the intra-textual and inter-textual interpretive cycles. For example, after a researcher has developed a better understanding after reviewing several storylines together, important insights may be gained by going back and reviewing the individual storylines once more.

The second goal is to articulate the meaning that specific stories have in relationship to a broader narrative of historical practices (Thompson et al., 1994). According to Giorgi (1989), a holistic understanding of the text develops over time. The application of a hermeneutic framework must therefore, evolve over time. The understanding of the entire framework cannot be realized in a single reading of the text (Thompson, 1997). Through an iterative process in which each reading of the text encompasses a larger range of cultural and phenomenological patterns, the framework presents a complex and multi-layered scheme of interpretation. These layers are then implemented and the themes begin to arrive at a more holistic interpretation.

The researcher plays a realistic role in interpreting textual data. Hermeneutic research emphasizes that a comprehension of a text always reflects a melding of the interpreter's orienting conceptual framework and the texts being interpreted (Arnold and Fischer, 1994; Gadamer, 1993; Thompeson et al., 1994). The implication is that the researcher's interpretive orientation enables him or her to become aware of specific characteristics and pattern brought about by the textual data. Further, the time spent with the textual data can alert the researcher to new questions and bring about revisions from the initial viewpoint. Therefore, a hermeneutic

researcher must pursue possibilities and be open to avenues provided by the text rather than pushing a contrived system of meaning onto the textual data (Gadamer, 1993; Ricoeur, 1981).

G. HERMENEUTICS IN SUPPLY CHAIN RESEARCH

The need for qualitative research as noted earlier is becoming more apparent as we hear of more and more call for papers that ask for research that is aimed at understanding process questions and about how and why things emerge, develop, grow, or terminate over time (Fawcett and Waller, 2011). As researchers there are several avenues we can take to answer these questions. However, the question arises: When is the hermeneutic methodology appropriate in supply chain research?

*See Table 1:
Possible Hermeneutic Research Topics within Supply Chain Management*

First, hermeneutics can be used when deeper meaning in the story or process is desired, not just the facts and outcomes. Hermeneutics allows the researcher to distinguish practices and understand processes. For example within the collaboration setting, a collaborative capability may be desired. Hermeneutics can help identify current practices and recognize where these practices are successful and justified. Hermeneutics research can study continuous improvement techniques that create customer value and define processes that add value. For example in the additive manufacturing setting, hermeneutics can help define the opportunities where a more advanced technology manufacturing capability is needed.

Second, the hermeneutic approach would be appropriate when the culture or politics is complex and nuanced, and meaning is found at different levels. This type of understanding cannot easily be measured, which calls for something that is more interpretative in nature. For example, corporate social responsibility practices are often complicated because not only is the

supply chain involved, but also government and the need for disclosure. We can also investigate how investors may be changing the way they assess performance and invest in organizations with respect to company ethics and their social responsibilities.

Further, supply chain management is a system of systems or a set of systems working together. A more interpretive approach can help identify how organizations work together within the nuanced structure of an integrated supply chain. For instance, supply chain sustainability issues engage not only the supply chain but also industry and non-profit organizations.

Hermeneutics can distinguish how companies can contribute to effective, integrated public policies on the right issues. In addition, hermeneutics can identify collaborative capability dynamics and distinguish practices that sustain those capabilities. It can also be used to identify and characterize factors affecting the level of trust and commitment within supply chain relationships.

H. CONCLUSION

As part of the interpretive research family, hermeneutics focuses on the significance of meaning within a phenomenological setting. Researchers should not approach hermeneutics using a pre-determined set of criteria, or use coding to come to a consensus. Instead, the “hermeneutic circle” should guide the approach, where the process of understanding moves from parts to a whole back to the individual parts, in an iterative manner. This process allows for the creation of a dynamic whole of shared meanings between subjects and phenomenon.

The use of hermeneutics within the supply chain field gives researchers another option to ensure a rigorous interpretive analysis. Hermeneutics can a) create understanding between subjects and the social and cultural context, b) assess the social construction between the researcher and the subject, c) create awareness of possible multiple interpretations among

participants for a given sequence of events, and d) develop awareness of better processes and opportunities for value creation (Thompson, et al., 1990; 1997; Murray, 2002; Butler, 1988).

Researchers may choose from among several types of qualitative/interpretive approaches when investigating phenomena. However, not all interpretive approaches are the same.

Hermeneutics provides an ontological, epistemological perspective. If socially constructed phenomena, such as the investigation of supply chain management are to be comprehensively studied and researched, there is a strong need for research to understand the constructivist perspective exemplified in phenomenological hermeneutics. This goal of this paper was to stimulate interest and much needed understanding of interpretivism among the broader research field of supply chain management and inform the perspectives of the growing number of interpretive researchers.

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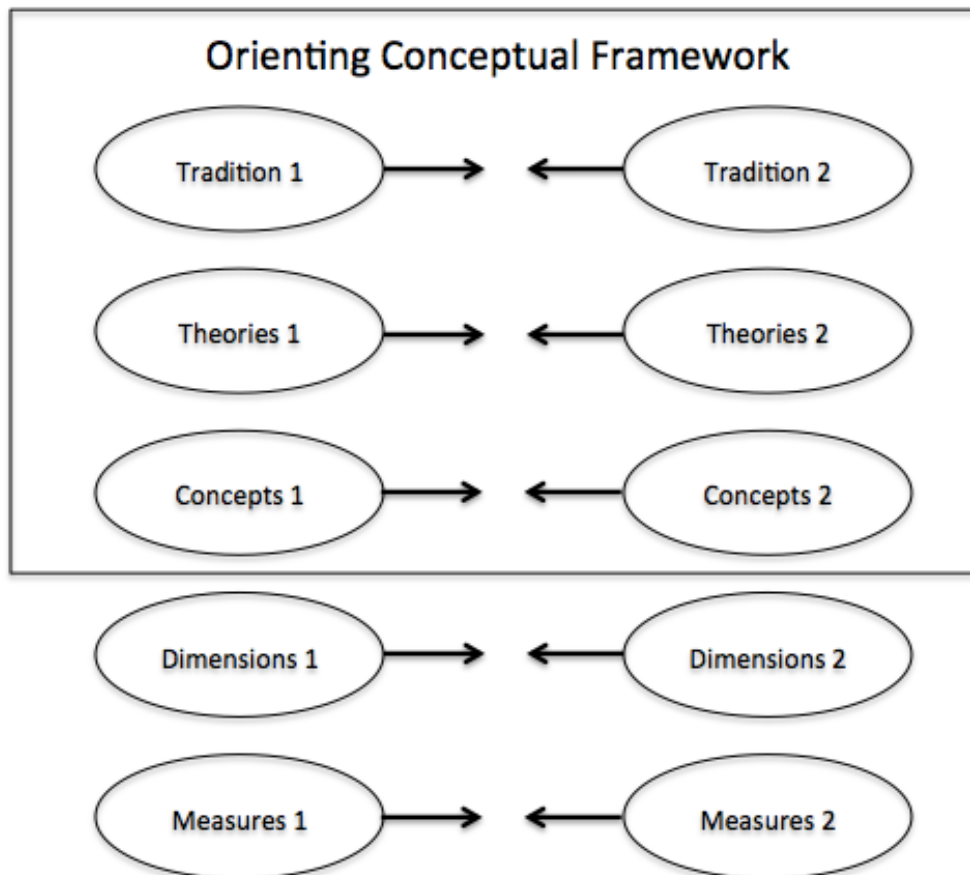
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J. FIGURES

Figure 1: Orienting Conceptual Framework Focus



K. TABLES

Table 1: Possible Hermeneutic Research Topics within Supply Chain Management

Topic	Opportunity	Why
Collaboration, Trust	Architecture Collaborative Dynamics	<ul style="list-style-type: none"> • Distinguish practices that sustain current capabilities and develop new collaborative capabilities. • Identify conditions under which tightly coupled relationships strategies are justified. • Characterize factors affecting the level of trust and commitment in SC relationships.
Corporate Social Responsibility, Ethics	Use of Big Data Human Rights	<ul style="list-style-type: none"> • Investigate the shrinking role of government leading to exploration of voluntary and non-regulatory issues. • Understand the growing demand for great disclosure. • Analyze how investors are changing the way they assess companies' performance.
Sustainability	Organization System Development Processes	<ul style="list-style-type: none"> • Investigate how companies can embed social license into their strategy and processes. • Distinguish how companies can contribute to effective, integrated public policy on the right issues. • Examine how organizations can engage the supply chain, industry and non-profit organizations to achieve sustainability goals.
Additive Manufacturing	Processes Network Redesign	<ul style="list-style-type: none"> • Study continuous improvement techniques to create customer value. • Define the opportunities where additive manufacturing can add real value to design. • Investigate how technologies can deal with and enhance current manufacturing problems.

IV. ESSAY 3: THE INTERCONNECTED ROLE OF COGNITION, COMMITMENT, AND CAPABILITY IN SUPPLY CHAIN RELATIONSHIPS: A HERMENEUTIC APPROACH

A. ABSTRACT

Since the 1990s, researchers have argued that appropriate management of supply chain relationships is a determinant of firm performance. The literature argues that managing relationships to enable the co-mingling of complementary competencies across a supply chain network can help a firm establish a distinctive advantage. However, research has shown that major methodological and measurement issues blur our understanding of the nature of the link between tightly coupled relationships and performance. Through hermeneutical analysis, we evaluate the operationalization of these tightly coupled supply chain relationships using interview data from a combination of 11 manufacturers and retailers who practice collaborative behavior. Through an iterative approach based on an orienting conceptual framework, we identify the conditions under which tightly coupled relationship strategies are justified and the elements that constitute an effective relationship strategy. From these findings we introduce the cognizance, commitment, capability framework.

B. INTRODUCTION

Strategic decision makers persistently struggle to help companies achieve differential firm performance (Porter, 1991; Rumelt, Schendel, and Teece, 1991; Allred et al., 2011). To provide insight into this challenge, Dyer and Singh (1998) presented the relational view of the firm and contrasted its insights to those of industrial organization theory (Porter, 1980) and the resource-based view of the firm (Wernerfelt, 1984; Barney, 1991). Dyer and Singh (1998) have argued that vital resources reside outside a firm's boundaries. Only by working collaboratively can firms access these dispersed, complementary resources, leveraging them for supernormal rents. Dyer

and Singh essentially suggest that the relevant entity of competition is no longer the firm; rather, it is the supply chain network. Research has indeed shown that collaborative organizations outperform their less collaborative counterparts (Allred et al., 2011; Dyer and Hatch, 2006; Fawcett et al. 2011; Gulati et al. 2000).

As Table 1 illustrates, a growing body of empirical research links the effective co-mingling of supply chain competencies to improved firm performance (Allred et al., 2011; Dyer and Hatch, 2006; Fawcett et al. 2011; Gulati et al. 2000). Frohlich and Westbrook (2001) along with other researchers indicate that close working relationships and shared resources are associated with productivity and market share performance (Narasimhan and Kim, 2002; Rosenzweig et al., 2003; Nyaga et al., 2010; Allred et al., 2011; Cao and Zhang, 2011; Huo, 2012; Schoenherr and Swink, 2012). Research further indicates that organizational interdependence in terms of shared knowledge and skills coupled with a deep understanding of an organization's supply chain lead to competitive advantage (Zacharia et al., 2009). Importantly, emerging research has shown that the capability to work closely with other members of a firm's supply chain network allow companies to achieve competitive advantage through the development of new products faster, enhanced quality, lower costs, quicker fulfillment times, and improved customer service (Cachon and Fisher, 2000; Frohlich, 2002; Ketchen et al., 2007; Rinehart et al., 2008).

See Table 1

Exploring the Empirical Link between Tightly Coupled SC Relationships and Performance

However, empirical consensus has yet to emerge. Some empirical research has demonstrated either non-significant or negative relationships between tightly coupled supply chain relationships and firm performance (see Table 1). For example, Koufteros et al, (2012) found that supplier development and partnership do not provide performance benefits. Thun (2010)

suggest most companies are unable to align their IT implementation with their supply chain strategy, impeding integration and thus performance improvements. Villena et al. (2009) show that executive risk bearing reduces willingness to make risky decisions and thus 1) discourages close working relationships among supply chain partners and 2) hinders performance improvements. Further, additional research shows more complex and nuanced relationships exist between close supply chain relationships and improved performance. For example, Terjesen et al, (2012) show that the relationship between supply chain integration and operational performance is an inverse U, suggesting that there are costs to a high degree of internal and external integration. Das et al. (2006) found that there is an optimal level of integration. Efforts that fall below or above this optimum diminish performance. Further, effective internal integration antecedes external integration and improved performance.

Discrepancies in the research findings clearly illustrate that despite the intuitive appeal and intense interest in tightly coupled supply chain relationships, our understanding of how to effectively conceptualize and operationalize such relationships is still developing. Therefore, the question arises: “Why have firms not been able to formalize relational capabilities?” This complexity of this question suggests that a more nuanced exploration into the dynamics of tightly coupled supply chain relationships is needed. Through hermeneutical analysis, we evaluate the operationalization of these tightly coupled supply chain relationships using interview data from a combination of 11 manufacturers and retailers who practice collaborative behavior. Through an iterative approach based on an orienting conceptual framework, we identify the conditions under which tightly coupled relationship strategies are justified and the elements that constitute an effective relationship strategy. From these findings we introduce the cognizance, commitment, capability framework.

C. ORIENTING CONCEPTUAL FRAMEWORK: TWO PERSPECTIVES ON RELATIONAL STRATEGIES

This section presents an orienting conceptual framework for further hermeneutical analysis on relational strategies (Thompson et al., 1994; Thompson, 1997; Woodside et al., 2005; Murray, 2002). This framework is used to help interpret meaning of the phenomenon of relational strategies and the dynamics of the interplay between etic and emic. An investigation of the relational strategies literature indicates that many theories have been used to look at supply chain relationships. Table 2 reviews those theories.

See Table 2
Top Theories Used in Supply Chain Relationship Literature

The orienting conceptual framework for the hermeneutical analysis is based on the theories that are found in the supply chain relational strategies literature. We identify in the framework two perspectives that will ground our investigation. First, the value appropriation perspective focuses on theories such as transaction cost economics and resource dependence theory. These theories suggest that firm's decisions to use either vertical integration or market mechanisms depends on the relative monitoring of costs that arise from uncertainties due to opportunism and collaborative partners' self-interest. (Kaufmen et al., 2000; Cao and Zhang et al, 2011). Second, the distinctive value co-creation perspectives based on relational theories such as resource-based view of the firm, relational view and social exchange theory, explain how firm performance is implemented through strategic resources such as core competence, dynamic capabilities, and absorptive capacity (Barney, 1991; Prahalad and Hamel, 1990; Teece et al., 2007; Cohen and Levinthal, 1990). While both of these perspectives may have some over lapping operationalization, they also have some very distinct qualities.

See Figure 1
Orienting Conceptual Framework for Relational Strategies

Value Appropriation Approaches

The first perspective is a value appropriation approach. Supply chain collaboration is viewed as a business process where supply chain partners work together toward common goals to reduce costs. Theories such as transaction cost economics (Williamson, 1975; Barringer and Harrison, 2000; Cao and Zhang, 2011) and resource dependence theory (Emerson, 1962; Pfeffer and Salancik, 1978) are very influential. From the perspective of TCE, integration and collaboration can be viewed as an investment in a transaction-specific asset because it cannot be redeployed to a different partner if the original relationship is terminated (Zhao et al., 2008). Resource dependence theory suggests that collaboration at times is asymmetrical in power; organizations form relationships because of dependence upon another organization in order to succeed (Pfeffer and Salancik, 1978).

The concepts behind value appropriation approaches are strategic in nature and focus on contracts. For example information sharing strategies would focus more on market strategies and planning (Narasimhan and Kim, 2002; Zhao et al., 2008; Kim, 2009; Wong et al., 2011; Sanders, 2008; Wiengarten et al., 2012). Problems facing manufacturing, such as parts shortage, delivery and quality problems and cost increases, are rooted in the lack of effective integration and collaborative strategies and are usually solved via short term fixes (Flynn et al., 2010; Rosenzweig et al., 2003). The relationships are “arms-length” and usually do not last over time (Fawcett and Magnan, 2002; Richey et al., 2010), meaning that alliances and partnerships are not formed. Further, these relationships may be asymmetrical in power and are inherently unstable (Lawler, 1986; Rubin and Brown, 1975).

Drivers behind value appropriation approaches suggest that when resources and competencies are not readily or sufficiently viable, firms are likely to establish ties with other organizations (Child and Faulkner, 1998). Zhao et al., (2008) suggest that information sharing, synchronized planning, and working together with customers and suppliers to jointly resolve problems and facilitate operations are important drivers for collaboration between organizations (Zhao et al, 2008). The determinants of most value appropriation approaches are frequency of the interaction, specificity, environmental uncertainty, limited rationality, and opportunistic behavior (Williamson, 1981). Next we will discuss distinctive value co-creation approaches.

Distinctive Value Co-Creation Approaches

The second perspective, distinctive value co-creation approaches, focuses on a formation of close, long-term partnerships where supply chain members work together and share information, resources, and risks to accomplish mutual objectives. RBV argues that firms that develop valuable, inimitable, rare, and non-substitutable capabilities will outperform their competitors (Dierickx and Cool, 1989; Barney, 1991). Through value co-creative efforts, firms become more dyadic, focusing on a buyer/supplier relationship (Fawcett and Magnan, 2002), and organizations are able to develop a competitive advantage from relationships that are collaborative with alliance partners.

When looking for distinctive value co-creation approaches, researchers would identify concepts more relational in nature. The relational view suggests that exchange relationships occur when the partners invest in relation-specific assets, develop inter-firm knowledge sharing routines, use effective governance mechanisms, and exploit complementary capabilities (Dyer and Singh, 1998). These strategies would include such behaviors as investing in partner capabilities and process development and developing long-term relationships (Saeed et al., 2011;

Flynn et al., 2010; Koufteros et al., 2007). Close contact would be maintained with strategic partners and satisfaction would be measured (Swink et al., 2007). All forms of resource sharing strategies would take place along with shared expertise and training (Nyaga et al., 2010; Allred et al., 2011; Saeed et al., 2011).

Distinctive value co-creation approaches suggest that most firms cannot develop all capabilities needed internally, this need drives organizations to develop relationships between partners that allow organizations to obtain these resources (Golicic and Mentzer, 2005). Relationships enable firms to take advantage of complementary assets and to reduce redundancy (Dyer and Singh, 1998). The more capabilities an organization needs, the more likely they are to look at building a closer relationship with the organization that can provide those capabilities (Golicic and Mentzer, 2005). Some of the drivers and determinants behind value co-creation approaches include the desire for trust, commitment to the relationship, complementary resources and capability development, relation-specific assets, knowledge sharing routines, and effective governance (Dyer and Singh, 1998).

It should be recognized that these two different approaches have value and are appropriate in different settings. Therefore, given the intricacies within relational strategies, a more balanced conceptualization of collaboration capability is needed. The tension between value appropriation and distinctive value co-creation approaches was used as an orienting standpoint for the analyses of the verbatim text.

D. METHODOLOGY

Despite enduring and intense interest in cooperative strategies, relational capabilities remain poorly understood. To ground the research in the extant literature, David and Han's (2004) approach for performing a comprehensive and relevant literature search was employed.

Specifically, the ABI Inform and ProQuest databases were searched using the following key words: “integration,” “coordination,” “collaboration,” in the supply chain setting. Over 200 articles were reviewed to inform and design the phenomenological interview guide. Next, an advisory board—composed of executives with extensive backgrounds in collaborative planning—provided feedback on the research content and process, ensuring managerial and theoretical relevance. Finally, the research team attended national meetings of VICS CPFR Planning Committee and participated in a CPFR certification course to firmly ground them in the language and practices associated with collaborative planning. This three-step process helped assure that the open-ended interview guide could be appropriately used to gain insight into how companies are developing and managing the relational capabilities needed for effective collaborative planning, forecasting, and replenishment.

Context, Sample and Interview Process

To enrich theory related to the process of developing relationship capability and to better understand relational strategies, we chose to conduct research in the Collaborative Planning, Forecasting and Replenishment (CPFR) setting. By promoting and enabling collaborative practices, CPFR aims to improve efficiencies and enhance value co-creation. CPFR encourages information sharing regarding inventory levels, sales forecast, and promotion plans to 1) match supply to demand, 2) support efficient operations, and 3) make sure product is available on the shelf when customers want to buy it. The idea is that a consistent cadence of communication improves visibility and helps managers plan operations so that resources—including plant and equipment, labor, inventory, and transport capacity—are effectively used across buyer and supplier organizations throughout the replenishment process.

Textual data were generated by means of phenomenological interviews from companies selected from VICS (Voluntary Interindustry Commerce Solutions) CPFR Case Studies and Collaborative Commerce Award Winners. Eleven companies were interviewed ranging from advanced adopters of CPFR practices to those companies who had adopted CPFR and then dropped them. The sample was made up of 7 suppliers and 4 retailers, some who are currently using CPFR and others that adopted CPFR practices and then dropped them, creating a 2x2 matrix dyadic relationship allowing for a diverse range of CPFR practices to be studied. Retailer 1 and 2 were both advanced users of CPFR practices and their suppliers were in various stages of CPFR usage. Retailers 3 and 4 had both adopted CPFR practices and then chose to drop the practice later. Even though their suppliers were not using CPFR with these retailers, these suppliers were also in various stages of CPFR practices with other organizations.

See Figure 2
Phenomenological Interview Sample

A synopsis of the research goals and a copy of the phenomenological interview guide were given to the companies once they agreed to participate. A phenomenological, open-ended interview guide was used to help managers to describe events and processes. Follow-up questions were used in pursuing insight into unique practices and programs that became evident during the interview. Because of the cross-functional nature of collaborative research, the contact manager often invited other managers, purchasers, and project leaders over CPFR initiatives. To avoid demand characteristics and to tell a more complete story of how the complex processes of relational capability are built, multiple subjects within each company were used (Schwenk, 1985; Golden 1992; Miller, Cardinal and Glick, 1997).

A mixed-gender interview team conducted the interviews (Adler and Adler, 1994). Both researchers were experienced and trained in this interview technique. Prior to each interview, the

participants were assured of anonymity. Interviews were anywhere from 1 to 4 hours in length. Each interview was audiotaped and transcribed verbatim resulting in a 1,372-page, typed, double-spaced text.

Hermeneutic Analysis

To answer the call for papers that ask for research that is aimed at understanding process question and answer the questions about how and why things emerge, develop, grow or terminate over time (Fawcett and Waller, 2011), the Hermeneutic approach was chosen. Hermeneutics is an interpretive/qualitative methodology that analyzes the axiological epistemological, and ontological aspects of phenomenon. Hermeneutics has made its presence in such diverse management fields such as information systems, accounting, marketing, and organizational studies (Hirschman, 1990; Thompson, et al., 1990; Phillips and Brown, 1993; Thompson, 1997; Butler, 1988; Standing and Standing, 1998; Murray, 2002; Woodside et al., 2005; Verganti and Oberg, 2013). Hermeneutics can a) create understanding between subjects and the social and cultural context, b) assess the social construction between the researcher and the subject, c) create awareness of possible multiple interpretations among participants for a given sequence of events, and d) develop awareness of better processes and opportunities for value creation (Thompson, et al., 1990; 1997; Murray, 2002; Butler, 1988).

The Hermeneutic approach is an iterative approach, which entails two distinct stages in the interpretation of textual data. This two-step approach proceeds through a series of part-to whole iterations (Arnold and Fischer, 1994; Thompson et al., 1994, Thompson 1997). The first step allows the researcher to gain a sense of the whole understanding of each individual interview (Giorgi, 1989). Using each interview as a unique observation, the intra-text cycle readings were used to develop an integrated understanding of the conveyed meanings of the text (Thompson,

1997). That is, each company is studied without reference to the other companies. During this process temporal sequencing was highlighted and narrative framing was used to develop a story for each interview company (Murray, 2002).

The second part-to-whole movement is a shift from interviews to stories as an inter-textual analysis emerges. Here, the researchers looked for patterns and differences across the story lines (Thompson, 1997). The interpretive cycle shifts between the intra-textual and inter-textual data. To arrive at a holistic interpretation of the data, the researchers used an iterative process. Based on an orienting conceptual framework, each reading of the text identified patterns and themes. These patterns and themes helped to better refine the ideas around the orienting conceptual framework.

The researcher plays a practical role in interpreting textual data. Hermeneutic research requires that a knowledge of the data reveal a link between the texts being analyzed and the interpreter's orienting conceptual framework (Arnold and Fischer, 1994; Gadamer, 1993; Thompeson et al., 1994). The researcher becomes aware of specific characteristics and patterns brought about by the textual data through the researcher's orientation. At the same time, the interaction with the textual data can inform the researcher to new questions, bringing about adjustments from the initial orienting conceptual framework. In other words, hermeneutic analysis allows the researcher to be open to possibilities highlighted by the text rather than forecasting a pattern of meaning on the textual data (Gadamer, 1993; Ricoeur, 1981).

The analysis process lasted three months. From this process, greater insight was gained into the nature and complexity of a relational capability. As the iterative process continued, defining characteristics arose to help better understand why companies struggle to create strong relational

ties. From these findings a framework was developed to build upon existing theory and for use in future research.

E. THE INTERCONNECTED ROLE OF COGNITION, COMMITMENT, AND CAPABILITY

Using the value appropriation vs. value co-creation approaches as an orienting frame of reference, three common overarching themes emerged from the analysis:

- 1) Sometimes firms were involved with other organizations, where there was no perception of value in collaborating. Generally, firms perceived that commodity items were best traded using arms-length transactions and competing on price. When a company attempts to create collaborative relationships in this situation, the economics of the relationship do not reward collaboration. Therefore, a “cognition of relational benefits” had not been developed.
- 2) Further, firms were bound to other firms out of fear of consequences. Firms were not able to compete without the partner’s capabilities because their partner has a VRIN resource and switching costs are high (Williamson 1981). The firm is asymmetrically bound to the partner primarily because there are no other options available and fears losing the capabilities of their partner (Zhao et al 2008). Therefore, there is not a strong “commitment to the relationship.”
- 3) Low levels of commitment may provide firms with enabling forces strong enough to move the firm to an appropriation type of relationship, which may allow them to develop some core competencies. However, they do not develop a distinctive value co-creative “capability development.”

These three observations help us begin to answer the question, “Why have firms not been able to formalize relational capabilities?” Throughout the findings, actual quotes from the interviewees will be used. Henceforth, all quotations indicate direct quotes from the interviewees.

Cognition of Relational Benefits

Sometimes collaborative efforts break down because decision makers don't fully understand all the nuances of the situation that are happening. They are aware that collaboration can be beneficial, however, awareness is not enough (Richey et al., 2010; Jin et al., 2013). A cognizance

of the phenomenon is needed. Supply chains are complex systems (Cooper, Lambert, and Paugh, 1997; Mentzer et al., 2001) and the need to recognize their complexity is crucial for any type of change to take place (Fawcett, Andraski, Fawcett and Magnan, 2009). Within the SC network, firms must be not just aware, but cognizant of the surrounding environment. Organizations depend on the environment for resources while at the same time they must also evolve with the environment as it changes. Cognition involves internalizing the need both in terms of threats within the company and opportunities for growth (Scott and Davis, 2006).

Pack Right, a large consumer packaged goods manufacturer who has been successful in implementing the CPFR practices, shares an example of becoming aware of the environment and the need for a better relational capability.

John: I think ours has been a journey, so it's not an ah-ha moment. It probably started helping—was when Greg was the sales manager, where the recognition that the retailer is an important component in our ability to reach the consumer shopper, as opposed to something we have to go through. That dialogue started very aggressively in with Pack Right, so how do we do business with these guys? That has continued to evolve. I think it really crystallized from a company strategy when our EG took over as a previous CEO and talked about the first and second only truth, and this whole idea of the moment of truth.

Back in the early 90's, Pack Right was working with retailers to measure in stock at the shelf level. Therefore, when the application to collaborative work processes became a value-creating concept, they were already very pre-disposed to the idea that collaboration could reach significantly greater levels as an organization. As John says, "It is building awareness way beyond our retailer."

However, sometimes awareness of a relational capability is not always apparent. Kim works for Parktronics a small electronics manufacturer that works with the big box electronic stores. Kim's frustration is that these stores are not aware of Parktronics capabilities to share information because they deem them as a "C" supplier.

Kim: We're more like a C customer to them, so we get the C supplier treatment. We are not making the headway of true collaboration, where we do some real forecast sharing, where we take their forecast, where we can even provide them feedback on how good their forecast is. I've been begging my VP of sales to just give us a client. Let me talk to a customer. Give me the opportunity to talk to a customer because I think we have a really good story to tell. I don't even think our salespeople truly know what we're capable of. They don't really care to know, either. I think if we talk to a likeminded person on the customer side, ideally a purchasing manager or replenishment planning manager, they would go, "Wow, you guys can do that?" Maybe they think we're not capable of it and that's why they're treating us with that hands-off approach.

Kim's inability to make their capabilities known to their customers leaves them in a situation where they are "left to only transactional relationships" with this retailer.

Further, we find that the optimal course of action is dependent upon the internal and external situation. This means that managers must become cognizant of sequential, cause-and-effect relationships among environmental, decision-making, and performance variables. Therefore, we found that managers must develop a *contingent response*—a strategy for utilizing the firm's resources to achieve a sustainable competitive advantage that leads to above normal returns on investment. Companies need to fit the response to the exigencies of the new situation. For example, Supplies-To-Go a large retail office supply store designed the rules of engagement with their vendors, and defined their supplier guide. Working with over 20 vendors in a relational setting to set the rules for performance and goals, they were able to focus on sharing information to improve business and forecasts. This gave them capabilities to be cognizant of shifts in the market, which allowed for better decision-making. Robert shares with us how they kept the company apprised of new developments.

Robert: In the beginning, it was forecasting and planning. Later, we added things like compliance violations in terms of shipment integrity, if the shipments weren't making it into the CFCs, but a lot of it was centered around supply and demand. Are our forecasts consistent? Is there inventory based on what they have in the chain consistent with what our demand is? Do they see service interruptions? Some of them spin off into that. If there are other events going on during the year, whether it's: back to school, or holiday, or

back-to-basics, catalog conversion, new customer acquisition, all of those are key drivers to where you may or may not see forecast variation.

For managers, the key is to become aware that the environment is changing and then correctly identify the forces driving the changes and their influence on competitive strategy. We found that managers should employ enablers to strengthen inter-functional and inter-organizational interaction and relational quality. As they evaluate their companies' strategic positioning, managers were likely to find that globalization, heightened customer demands, and compressed technology cycles were increasing competitive intensity, putting tremendous pressure on cost management. Greater focus on financial performance is further inducing managers to strive to increase asset returns and reduce concept-to-market lead times. Interestingly, an information technology revolution is accelerating these competition drivers. Matt from Pack Right talks about how they used new technology to help their customers be more in tune with shoppers:

Matt: "The technology environment that allows shoppers to become more in charge of their access to shopping experiences they want is leading to the megatrend—I think—of retailers becoming more multi-channeled and trying their hands in more ways of reaching the shopper. We are very well positioned to talk to a retailer who is trying to experience multi-channel diversity, because we're focused on getting that shopper wherever they are. I think there are still pockets of retailers who haven't adopted the collaborative approach as much. I think the multi-channel phenomenon is going to make them even more aware of their need to partner and collaborate, and I think we're really well positioned to be an answer to that need.

Finally, in order to be successful, we found that firms need to consider the impact and relevance of environmental forces in formulating strategic and operational goals, priorities and tactics. Globalization, outsourcing and electronic connectivity are all environmental forces that have changed the nature of the value-add process of products and services from one of vertical integration within a small number of firms to that of a globally dispersed supply chain. Supply chain collaboration within such a complex context is necessary to effectively bring awareness of

supply and demand across the value chain in a way that firms can make the most efficient use of their resources to satisfy customer demand profitably.

Commitment to the Relationship

At other times, collaborative efforts break down in the commitment process.

Commitment focuses on both the willingness to change and the need to mobilize “collaborative” resources. There are a couple of reasons that we found why commitment might not emerge in collaborative efforts. Jean, who works at a large electronics company talks about change within their organization. This company is a very consensus driven organization where “decisions have to be made through a lot of meetings and involving a lot of people.” Therefore, commitment to change takes a very long time. Jean elucidates this through her comments.

Jean: In cases like this, where situations where we really need one group to be accountable for something and then saying that group is accountable for that and they should drive the forecasting decision across the company. There’s no procedure to—nobody buys off on that. I mean there’s no—ultimately, no structural process to ensure that that’s the team that has the decision making authority. That’s my perspective.

Organizations tend to persist in a steady state until an external force dictates change.

Lewin’s (1951) force field analysis explicates the role of resisting forces as impediments to change and counterweights to the previously discussed forces that are driving change. Because they freeze an organization in its entrenched behavior, resisting forces debilitate the strategy-implementation and organizational-transformation processes (Dent and Goldberg, 1999; Kotter, 1995). Thus, collaborative inventory initiatives that require altered behavior, revised roles and responsibilities, or the acceptance of new risks are extremely difficult to execute. Unfortunately, we found that when firms do not have the ability to change with the external environment or collaborate more efficiently than their rivals, they risk losing relevance. SC managers claim that they need to understand better the dynamics of change as well as the nature of core collaboration

resistors. Only then will they be able to select and implement initiatives to mitigate these resisting forces.

Tavoy, a large electronics manufacturer whose “primary focus right now is getting back to a sell-through culture.” That is, they attempt to reduce the amount of inventory they receive from their supplier against what is actually sold. Their goal is to get all of their “groups aligned to support a sell-through culture and mentality,” making sure everything that they do is “getting them back to the basics of being customer focused.” To do this, some manufacturers create promotions or special advertising in an effort to increase the sell-through rate of its products at the retail level. For Tavoy, part of this is changing the company’s culture of accountability.

Lonnie and Caley discuss the resisting forces that are facing them.

Lonnie: I think we’re not very good at having one group be accountable for something without another group—we’re a very consensus driven company. We are a consensus decision making, lots of meetings involving lots of people type of culture.

Caley: Yeah. That and, honestly, aligning all the different groups on what the one number is and where it comes from.

Lonnie: But other companies don’t even have to align is my point.

Caley: Yeah. No, absolutely.

Lonnie: When you have someone say, “I’m accountable for forecast,” there’s empowerment and structure and responsibility given.

Forces resisting collaboration vary throughout the supply chain. These resistors differ in strength and influence, and may exist anywhere within the processes and culture of the organization. Inadequate technology was often blamed for impeding collaborative initiatives and undermining shared inventory planning efforts. However, despite substantial investments for many companies in information and process technologies, collaborative inventory capabilities have not dramatically improved. This reality suggests that other forces are blocking

collaboration's emergence. Many cultural and structural barriers related to a company's commitment present the most intractable barriers to collaboration within a firm and across the supply chain. For example, Walkers, a grocery store chain talks about relationship management:

Max: A lot of it is just the personal relationships. There's a lot of times where we have people in here. The best sales vehicle that we've got to get people to try to understand our business model is, "Let's just go walk a couple of stores together and let us show you our commitment to the brand. Let us show you our commitment to our customers. Let us show you our commitment to high standards and continuous improvement and the fact that we're taking a long-range view of the business." We're not going to be in here saying, "Gee, we need a great program from you for fourth quarter because things are looking a little light fourth quarter."

No. "We want a great program from you that's going to help us grow our business over time." When they walk in and they see our stores and the way we merchandise our stores, our commitment to our product, our commitment to cleanliness and freshness and service and our people and things of that nature, hopefully, they say, "Boy. This is somebody I want to be working with and I'd be willing to invest and make some capital expenditure investments if I need new technology for manufacturing or if I need this or if I need that."

Another resistor is the willingness to commit to the relationship. Household Creations another large consumer packaged goods company share their frustrations with other organizations willingness to collaborate:

Sam: Let's talk about the willingness question first. I do think the more progressive retailers have realized that suppliers can provide them critical knowledge and bandwidth that they can't afford otherwise. We have capacity to think about [our companies specific products] better than [a major pharmaceutical company] does. In that sense, they're willing. There are other retailers who believe somehow this data is secret and usable only by them. . . . we went to all of our major suppliers, two months ago and said, we've got too much inventory in our stores. We want you to join with us to get inventory out of our stores. Sounds good. Here is a flash drive that has your supplier A and supplier B information on how much inventory you have in our stores. Don't share it with anybody. We want the flash drives back. It was a view of three months in the fourth quarter. They were so concerned about that information getting out, we had to sign for our flash drives.

Interviewer: Will self-destruct in five minutes.

Sam: Right. I think for them, they feel they're giving away some competitive advantage by sharing, so they're not willing. If you're not willing, you're going to be missing the boat because you're going to be looking around at your store level execution and your performance and you're wondering why everyone else is doing so well and you're having

all these problems. . . . Friendly Dollar is not sharing data. Friendly Dollar has this huge very deep database store level buy item history data. Can you guys share it? Why are you so interested? Another company asked us the same thing. Why do you guys want this data? We'd like to know how you're using our inventory and then adjust how you're doing it to make you need less. Very, very uncomfortable.

Interviewer: We think we can help you grow your business and grow it more profitably. They don't believe you. They don't trust you.

Sam: They think somehow we're going to use it to, I don't know, have an unfair advantage in negotiations or we're going to somehow understand that, hey, here's what we have so [our competitor] must have X. We're going to gain some undue competitive advantage. I don't know. People have only said that they're not comfortable. I'm down talking to [a manager] at Friendly Dollar. He said, you know what, we're going to share it with you. Maybe he's now starting to be willing. Let's talk about able. What process by which will you give me this data? You're going to give me eight 52 transactions? EDI? You're going to bury my EDI infrastructure? Are you willing to share it with third parties. . . .? A lot of people aren't. Are you going to charge me for it?

Kyle from Supplies-To-Go discusses the issue of willingness and how they have begun to work around the issue of an unwillingness to collaborate.

Kyle: I think you illustrate the benefits that we've achieved. We've grown our relationships with our vendors, so you communicate those to the new vendors. A lot of times you go to the vendor and say, "You are having issues with, and there's really a charter of okay. Let's go from here to here." That's how you get that commitment of, "Okay, our service level or lead times are too long. How do we reduce them?"

Then you have these collaboration discussions that allow you to identify those issues, and you continually track those to meet your initial goal that you set out. I mean it's a benefit. We sell it as a benefit to both organizations. You need commitment on their end because if you're forcing somebody to do it, it's not going to succeed. There has to be a commitment on the other side to want to do this.

Another reason why companies sometimes don't get commitment is it doesn't make sense.

One part of the relationship thinks there should be a commitment to collaborate in a certain way, but because the other party has a different understanding, and sometimes a more accurate understanding, the collaborative issue just doesn't make sense. You can walk away and have one person say they just don't get it and the other walks away and say they just don't get it and they never did figure out how to communicate.

Capability Development

The relational view represents the importance of collaborative relationships; yet, many organizations in our study lack the knowledge of the key constructs to capability development. As companies begin to share more information and work more collaboratively to design products, manage inventory, share transportation, we find that greater emphasis on governance structures is needed. The elements of the firm's ability to interface with its supply network affect its development of relational capability. Once again we turn to Sam at Household Creations as he discusses how they identify capability development:

Sam: We said, what is the potential flow opportunity and the size of the inventory, velocity, cost savings potential, number one. Number two, what's the value of this customer. Not just how many dollars do we sell or do they buy from us, but how important are they to our brands, to our shopper to marketing effort. I'll give you examples later. Number three, customer's big now today, but maybe they won't be in the future, so skate to where the puck's going to be, and that's our supply chain capability.

However, notwithstanding the competitive potential of a mature relational capability, firms are struggling to effectively influence strategic supplier relationships in order to make a difference. Lacking the commitment and the understanding, we found that some firms fail to make appropriate and required investments in the governance mechanisms and infrastructure required to unlock the advantage that is embedded within the network. Even companies that have been successful upfront with CPFR are still asking the question how they need to develop better competencies in order to compete in today's market world. Sandia, a successful electronics manufacturer, won a VICS award for their CPFR capabilities. They were smaller then, and so they partnered with a large electronics retailer to help them develop better capabilities. Miles talks about how even now, they are working to continue to build these capabilities.

Miles: We've been driving CPFR and the other collaborative planning tools for years off the notion of efficiency, whether it's improved forecast or inventory, reduced markdowns at the end of any season, and introduction of a new product. To the question, how does this

change our customer experience? How can we use the collaborative planning relationships with our own customers to change the customer experience in the store or on the Internet? Because that's where the battle is going to be fought in the future. That's a question companies are really asking. We've been efficiency focused. It may not be the game we want to play tomorrow. What do we need to change in these relationships in order to create move value and develop a core capability?

Our findings identify core elements of relational capability: culture, decision rules regarding division of labor and resource allocation, information exchange, performance metrics, people, processes, rewards, strategy, and as key antecedents to capability development. The dynamic capability literature hints that the investments in relational capabilities enable firms to reconfigure both internal and external processes, while organizing supply-based resources and routines (Teece et al., 1997; Eisenhardt and Martin, 2001; Newbert, 2007; Barreto, 2010; Allred et al., 2011).

The entrenched forces of not understanding the full benefits of collaboration, not having the perceived capabilities necessary to change, and the expectation that value appropriation is enough, moves the firm towards appropriation. However, this abandons the creative value generated by stronger relationships. The restraining forces of leaders not wanting collaboration, partners not wanting collaboration, and the perception of no value in collaboration lead to the firm reverting to a contractual and transactional level of collaboration.

F. THE COGNITION, COMMITMENT, CAPABILITY FRAMEWORK

To ground these findings into a framework for relational capabilities based on our orienting conceptual framework of value co-creation vs. value-appropriation, we investigated a derivative of strategy perspective proposed by Chen et al. (2007) that emerged in the rivalry literature as an overarching framework. Competitive dynamics theory suggests local firms need appropriate awareness, motivation, and capabilities to react to entrants (Smith, Grimm, Gannon and Chen,

1991; Chen, Su and Tsai, 2007). Chen et al. proposed an awareness-motivation-capability perspective to inform attacking behavior in rivalry situations. They suggest as companies become aware of the visible size or scale disparities that rival firms achieve, a cognizance of the competitive relationship becomes real (Ferrier, 2001).

Awareness is indicated by relative scale as a competitor's operating capacity compared with that of a focal firm (Baum and Korn, 1999). This awareness or cognizance motivates the firm to look at competitive actions taken by their competitor and provides the incentive for a firm's managers and industry stakeholders to consider the rival to be in direct competition (Chen et al., 2007). Capability is signaled by a rival's capability to contest, which in turn influences the intensity of the competitive relationship—the greater the scale of a given rival, the greater the perceived competitive tension (Chen et al., 2007). These three behavioral drivers influence a firm's decision to act or respond.

Whereas the awareness-motivation-capability framework is used in the rivalry literature, we note a similar, but slightly different relationship as we look at the processes needed to create relational capability. We borrow from and extend the work from Chen et al. based on our hermeneutic analysis to introduce the Cognizance-Commitment-Capability Framework. Both in rivalry and relational activities, awareness or cognizance needs to take place in order for change in firm relationships is to be realized. Chen et al., (2007) argue that awareness leads to motivation; we likewise propose that in order for a relational capability to develop, cognizance must lead to a commitment to the relationship. Both a firm's perception (cognizance) and a firm's commitment to relational advantage dictate the capabilities that a firm creates. These capabilities cannot be appropriated, they must be understood and motivation must be applied. When perceptions of the organization lead to transformative commitment, firms succeed in

developing unique, creative value. Figure 3 shows the relationship between the two antecedents of relational capabilities.

*See Figure 3
Cognizance, Commitment, Capability Framework*

Capability development focuses on investing in appropriate relational capabilities. As noted in our findings, collaborative supply chains develop the processes needed to organize resources that reside across organizational boundaries to create an inimitable co-creation of value. This is consistent with and builds on the organizing conceptual framework used to ground the research. Theories that are more relational in nature such as RBV (Penrose, 1959; Rubin, 1973; Wenerfelt, 1984) and the relational view (Dyer and Singh, 1998) are better predictors of distinctive value co-creation capabilities. The findings indicate that firms that co-configure their resources and develop more tightly coupled relationships are a better indicator of distinctive performance (Teece, Pisano, and Shuen, 1997; Eisenhardt and Martin, 2000; Barney, 2001.)

However, the theories more associated with value appropriation tend to focus more on collaborative efforts that reduce costs through a general lowering of uncertainties and opportunity costs (Das et al., 2006). Value appropriation approaches are a hybrid governance mechanism that helps firms protect specific assets, adapt to uncertainty and obtain performance heterogeneity versus developing a collaborative capability between firms (Heide and John, 1990, Noordewier et al., 1990, Das et al., 2006).

G. CONCLUSIONS

At every company that we visited, managers recognized the importance of collaborative processes. However, not all companies were able to sustain momentum over time and make collaboration the “way they do business.” The motivation for sustained success emerges when

managers feel an intense need to change the way business is done. At most firms, a significant emotional event (SEE) preceded this cognition. As cognition emerges, organizational rather than individual commitment develops. This organizational commitment is needed to mobilize resources to amplify investments in collaborative capabilities and mitigate resistance to changing established behaviors.

Through our analysis, we found that some companies are achieving a relational capability that allows them to achieve better integration among their supply chain partners. However, the reality is that creating value across boundaries is difficult to achieve. In the past, companies have been designed to use more value appropriation approaches to maximize efficiencies and minimize risks (Williamson, 1979; Jin et al., 2013). Past research has shown that companies struggle to design and develop strong ties that create more value co-creation capabilities (Villena et al., 2007; Thun, 2010; Koufteros et al., 2012). Our research has shown that the common approaches to promoting integration are inadequate drivers of behavioral change. At most companies, real commitment to a relational capability is missing. One consultant interviewed estimated that “only about 20% of CPFR adopters successfully leverage their collaborative relationships as a stepping-stone to strategic rather than transactional advantage.” Consistency is a key differentiator between advanced users of collaborative practices versus those who drop the process.

This research, through an interpretive hermeneutic approach, addressed the question, “Why have firms not been able to formalize relational capabilities?” Using an orienting conceptual framework of value co-creation approaches versus value appropriation approaches to base our study, we suggest the use of the Cognizance-Commitment-Capability development framework to better understand organizations ability to create a relational capability. As with all attempts to

enrich theory using qualitative inductive research, one must be careful generalizing the findings, while the nuances and interplay may be different from company to company. However, the framework developed in this paper begins to “lead to a better balance between theory building and theory-testing (McCutcheon and Meredith, 1993) and answers the call for more theory building research in supply chain management (Melynk and Handfield, 1998; Mentzer and Kahn, 1995).

As we continue to probe these questions, we can gain a better understanding of collaborative capabilities and the change management process. Greater clarity will emerge to help us make sense of today’s chaotic competitive environment and develop the capabilities to create value.

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I. FIGURES

Figure 1: Orienting Conceptual Framework For Relational Strategies

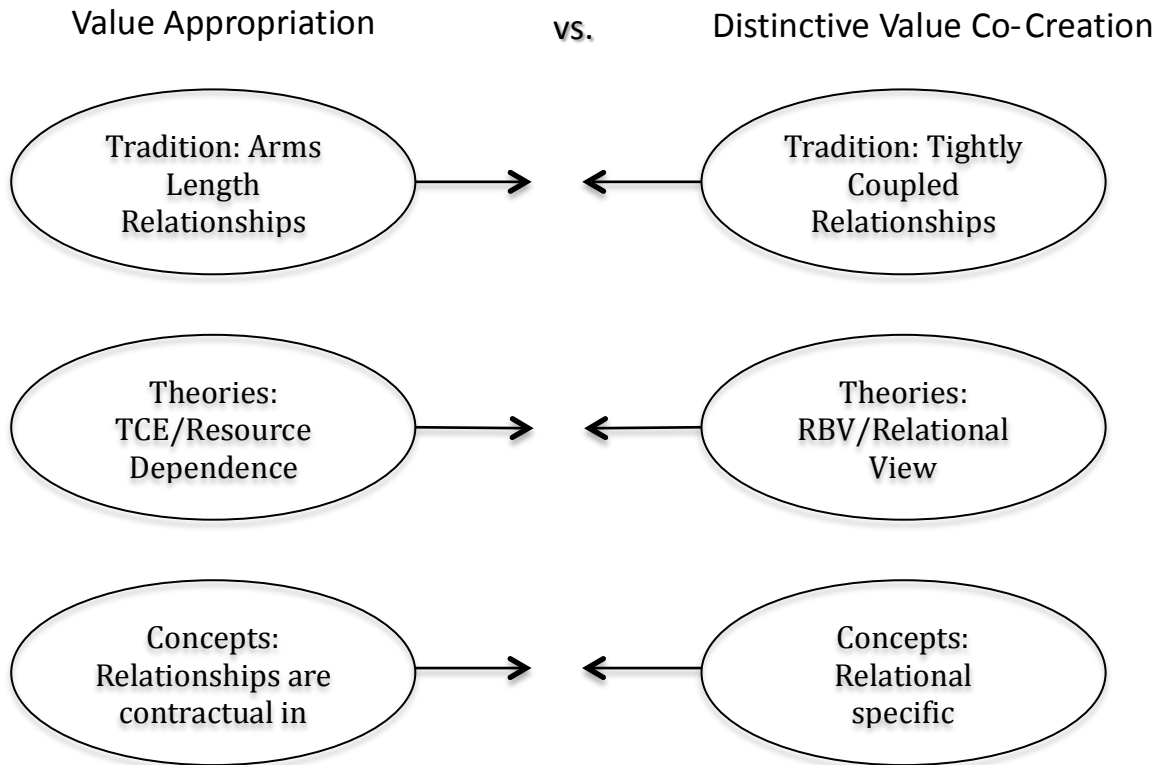


Figure 2: Phenomenological Interview Sample

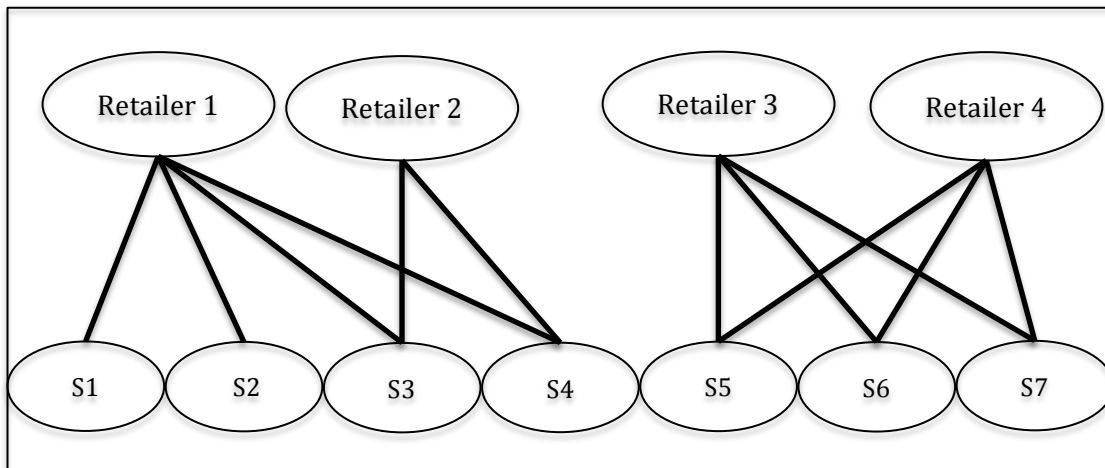
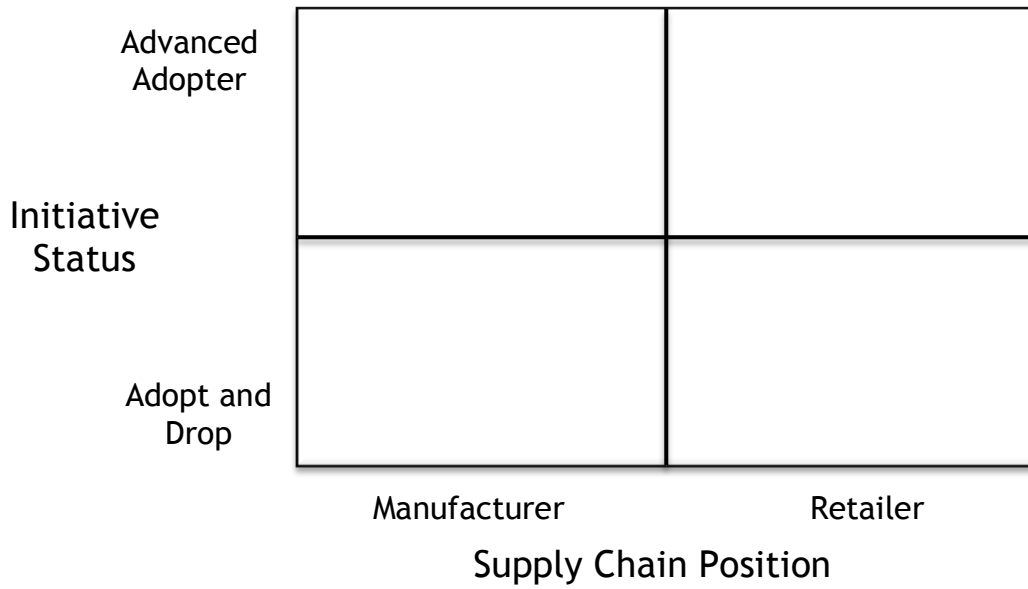


Figure 3:
Cognizance, Commitment, Capability Framework



J. TABLES

Table 1: Exploring the Empirical Link between Tightly Coupled SC Relationships and Performance

Positive	Negative/None	Complex/Mixed
Degree of integration is positively associated with productivity and market share performance (Frohlich and Westbrook, 2001).	Executive risk bearing reduces willingness to make risky decisions and thus discourages supply chain integration (Villena et al., 2007).	Supplier selection decision will have an impact on the buying firm's ability to interact with the supplier effectively (Petersen et al., 2005).
The coordinated use of SC integration and diversification strategies has a significant effect on firm performance (Narasimhan and Kim).	Most companies do not align their IT implementation with their supply chain strategy (Thun, 2010).	There is a point of optimal level of integration. External integration cannot be pursued prior to internal (Das et al., 2006).
Supply chain integration is positively associated with competitive capabilities and business performance (Rosenzweig et al., 2003).	Supplier development and supplier partnership do not provide performance benefits in a given domain (Koufteros et al., 2012).	Only high levels of integration manifest statistically significant positive effects towards product innovation (Koufteros et al., 2007).
Firms that are interdependent in terms of knowledge and skills, and those who share a deep understanding of each other, will likely have a high level of collaboration (Zacharia et al., 2009).	Supply chain collaboration set up either internally or jointly play no significant role in changing the level of execution directly (Kotab et al., 2011).	Internal and customer integration were more strongly related to improving performance than supplier integration (Flynn et al., 2010).
Collaborative activities lead to trust and commitment, which in turn lead to improved satisfaction and performance (Nyaga et al., 2010).	Many companies struggle to achieve high levels of collaboration. Cultures change slowly, requiring managerial fortitude and vision. Missed goals are the most common result (Fawcett et al., 2008).	Some integration routines have a positive impact on product development outcomes and market success, while other routines can hamper the collective effort (Koufteros et al., 2010).
Collaboration, as a dynamic capability, mediates the conflict resulting from functional orientations, and improves performance (Allred et al., 2011).		Performance success is dependent upon the firm's readiness to intensify its supply chain relationships (Kotzab et al., 2011).
Collaboration improves collaborative advantage and has a bottom-line influence on firm performance (Cao and Zhang, 2011).		Both internal and external process integration partially mediate the impact of the antecedents on performance (Narayanan et al., 2011).
SCI-Performance linkage is positive. Environmental uncertainty strengthens SCI-Performance link (Wong et al., 2011).		The relationship between SC integration and operational performance is an inverse U suggesting costs to a high degree of internal and external integration (Terjesen et al., 2012).
Internal integration improves external integration, which directly and indirectly enhance company performance (Huo, 2012).		Strategic supplier integration is significantly linked to market performance, but not to customer satisfaction (Swink et al., 2007).
Internal integration strengthens the positive impacts of external integration on both delivery and flexibility performance (Schoenherr and Swink, 2012).		

Table 2: Top Theories used in Supply Chain Relationship Literature

Theories Used	% of theoretical incidents in Literature
	33 articles/75 incidents
RBV	14.7
TCE	13.5
Contingency Theory	8.0
Social Exchange Theory	7.1
Relational View Theory	4.0
Information Processing Theory	2.7
Coordination theory	2.7
Knowledge-based View	2.7
Social Network Theory	2.7
Force Field Theory	1.3
Relational Governance Structures	1.3
Resource Dependence Theory	1.3



May 24, 2011

MEMORANDUM

TO: Stan Fawcett
Amydee Fawcett
Matthew Waller

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 11-02-477

Protocol Title: *Planning, Executing and Winning Together: A Roadmap to Integrated Business Planning*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 05/24/2011 Expiration Date: 05/23/2012

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 31 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

VI. CONCLUDING DISCUSSION

Supply chains are nuanced complex systems, where companies seek to cultivate dynamic collaborative capabilities to respond to intensifying competition and to environmental changes. Although there has been evidence that collaboration leads to firm performance (Allred et al., 2011; Dyer & Hatch, 2006; Fawcett et al. 2011; Gulati et al. 2000), empirical research has shown that the relationships are difficult to build and that results don't always lead to success (Koufteros et al., 2012; Villena et al., 2009), and that collaborative relationships are multifaceted and have mixed findings (Terjesen et al, 2012; Das et al., 2006).

Essay 1 completes an in-depth investigation of the integration/collaboration literature that delineates and summarizes contrasting dimensions and measures researchers use to explore supply chain relational strategies. The summary of the literature revealed novel insights into integration and collaboration. The analysis found that there is a wide variety of dimensions used to characterize the phenomenon of relational strategies. Outcomes to these relational strategies are also varied and mixed indicating that our understanding of how to conceptualize and operationalize tightly coupled relationships is still developing.

MacInnis (2011) suggests that conceptualization plays an important role in today's critical research. The principal objective of Essay 1 was to develop an orienting conceptual framework as a tool for achieving better sense-making for the interpretive analysis that was completed in Essay 3. The framework focused on value-appropriation and distinctive value co-creation approaches, specifically looking at theories surrounding these approaches. Value appropriation theories focus on theories related to transaction cost economics and resource dependence where decisions to use integrative and collaborative efforts depend on the relative monitoring of costs that arise from uncertainties (Kaufmen et al., 2000; Cao and Zhang, 2011). Distinctive value co-

creation approaches focus more on relational theories such as resource-based view and dynamic capabilities where firms are more dyadic and focus on deeper buyer/supplier relationships (Barney, 1991; Prahalad and Hamel; 1990; Teece et al., 2007).

Because of the nuanced relationships that exist in collaborative strategies, an interpretive approach was taken for the methodology of this dissertation. Specifically, hermeneutics was chosen to provide rich understanding of the ontological and epistemological phenomenon that arise in collaborative supply chain settings. Since hermeneutics is a newer methodology to organizational research, and practically non-existent in the supply chain field. Essay 2 provides a brief overview of the state of qualitative/interpretive research in the supply chain field. Then after giving a brief description of the historical evolution of contemporary hermeneutics, methodological guidelines were given for employing hermeneutics on organizational research.

Rather than using coding, hermeneutics uses a circular structure (Butler, 1998). It is based on the “hermeneutic circle” where researchers begin with an orienting conceptual framework to help develop meaning and understanding of a particular phenomenon (Heidegger, 1962; Gadamer, 1993; Ricoeur, 1981). The analysis uses text from interviews and employs an iterative “whole” to “parts” to “whole” approach to develop a deeper understanding of the story that is being told from the data to release the dynamic underlying meaning (Butler, 1998).

Essay 2 proposes that hermeneutics can be used in supply chain research when deeper meaning in the story or process is desired, which allows the researcher to distinguish practices and better understand processes. Hermeneutics is appropriate when the culture or politics within an organization and between organizations are complex and meaning is found at different levels. Hermeneutics can help identify how organizations work together within the nuanced structure of integrated supply chains.

Looking through the lens of the value appropriation vs. distinctive value co-creation orienting conceptual framework developed in Essay 1, Essay 3 concludes with the analyses of 11 manufacturers and retailers who practice collaborative strategies using a hermeneutic methodology outlined in Essay 2. To answer the question, “Why firms have not been able to formalize relational capabilities?” The research makes a contribution to the literature in the following ways. First, it develops understanding of the antecedents of collaboration, and how these antecedents influence the relational capabilities of firms. Second, the research develops a cognizance, commitment, and capability framework to help managers understand the relationships between the antecedents.

It becomes clear from this research that both a firm’s perception (cognizance) and a firm’s commitment to relational advantage dictates the capabilities that a firm creates and deploys. Capabilities cannot simply be bought or appointed, they must be understood and motivation must be applied in order to achieve high levels of relational capability. Cognition and commitment are the logical precursors to relationship capabilities. The interviews demonstrated that when the perceptions of the organization led to a transformative commitment, firms succeeded in developing unique, creative value. The cognition, commitment, capability framework helps organizations by allowing them to judge their perceptions and understanding the commitment needed to create relational value.

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VI. FUTURE RESEARCH

This dissertation establishes the foundation for a cognition, commitment capability framework of collaboration. However, future research is needed to confirm and clarify the evolution and the dynamics surrounding this framework. Importantly, research that addresses how firms document performance improvement and disseminate success stories to create cognizance and drive commitment is warranted, and better insight into what constitutes a successful story would be helpful. Further, it would likely be useful to understand why some firms fail to proactively engage in momentum-building activities.

Future research is needed to explore in greater detail how perceived power influences commitment. It appeared in this research that when firms were powerful, that power often blinded them to the creative potential of intense relationships. Future research should also evaluate the role of organizational commitment in relational commitment. The goal of future commitment research should be to develop a comprehensive, integrative theory of relational advantage that links cognizance, commitment, and capabilities to a proven path to distinctive collaboration. Research that yields such insight would help assure that more companies evolve to a collaborative advantage.

Further, given the rich data that is in the interview text, there are multiple areas for further investigation stemming from the interview data. The following identify possible routes for further investigation into a collaborative capability:

Customer Experience: Some retailers believe that the greatest benefit to a collaborative capability, is a firms ability to improve the customer experience. Managers at these retailers believe that collaborative relationships and systems are essential to their firms' ability to make and fulfill promises that customers value. The ability to offer a unique, distinctive experience is

perceived as the key to success in an increasingly competitive retail market dominated by information-empowered customers. For example, Dell has developed a competitive advantage through its ability to successfully collaborate with its suppliers to directly fulfill their end customer demands (Simatupang and Sridharan, 2008). Current research pays little attention to integrating and revealing the interactions of key design elements that drive the effectiveness of the customer experience. Further insights as to how organizations can work up and down the supply chain to enrich the end customer experience could greatly impact the supply chain literature.

Choreography: Companies that have achieved the highest levels of success have developed the ability to choreograph the collaborative process. Importantly, firms use different mechanisms and models to choreograph their processes. Even so, choreography encompasses the ability to 1) identify the correct participants for the collaborative behavior, 2) assign roles and responsibilities, and 3) develop a cohesive sense of belonging to the team. However, hampered by entrenched sociological and structural resistors, companies are unable to cultivate the holistic visions and relational influence needed for effective choreography (Fawcett et al., 2012). Not only are better insights into identifying managers who are able to fulfill the role of choreographers needed, but to identify managers who possess both the analytical skills and also more empathetic and intuitive skills for effective team building.

Cohesiveness: Further, it was observed that one of the most prominent challenges companies face is to get decision makers involved in the collaborative process—across the firm and among supply chain partners—is to get organizations across the supply chain to work from the same script. At least two reasons for the lack of cohesion were identified. First, diverse perceptions and levels of commitment are common across both functional areas and organizational levels.

Even among the most advanced companies, pockets of excellence, as well as pockets of reticence, exist. Second, managers tend to possess a self-perception bias that influences their decision-making. For example, managers may believe they are collaborating effectively while others with whom they work perceive the behavior as non-cooperative. Better communication, education, and measurement are needed to really get everyone on the same team.

Confidence/Confidentiality: Although CPFR appears to be a well-reasoned approach to aligning decision process, promoting information sharing between partners, and enhancing collaborative planning, further research is needed to determine successful keys to implementation. The education challenge surrounding a collaborative capability was manifest in some managers' comments that they did not understand how partners could come up with radically different forecasts from their own. These managers lack confidence in and understanding of their own process. Other managers noted that because they have confidence in their forecasting process, they view divergent forecasts as highly valuable insight into market activities. That is, partners cannot legally or ethically share details regarding what they are observing in the market, but they do include these activities as they develop their own forecasts. Managers who trust their processes and partners use collaborative planning as part of their firm's environmental scanning/competitive intelligence efforts.

When a supplier has multiple customers with varying degrees of demand planning capabilities, the customers that share the most accurate predictions of their demand will receive the most support for their future needs (Harwell, 2013). However, managers consistently explain that companies struggle to effectively share forecasts. Internal functions or operating groups are often disconnected, lack trust in one another, and use their own forecasts to manage their operation. Because managers across functions make decisions with different assumptions and

using a different set of numbers, conflict often emerges among operating groups. Further, the time horizon for execution visibility is often so short that day-to-day operations are easily disconnected from strategic goals. Upstream suppliers only have a limited view of future demand requirements. Thus, supplier forecasts are destined to be wrong. Similarly, retailers lack the competitive, category, and market insights that key suppliers possess. As a result, retailers also have to make educated guesses—that are often wrong—about channel capacities and timing. Further insights as to what causes discrepancies between forecasts and how to best communicate these discrepancies in a way that buyers and suppliers can develop trust and commitment from one another is warranted.

A. EXTENSION OF COLLABORATION RESEARCH

A review of the current humanitarian aid and disaster relief (HADR) literature suggests that the collaborative infrastructure—relationships, continuity plans, and governance structures—needed for effective communication and relief logistics are missing (Fawcett and Fawcett, 2013). The result is logistic glitches and bottlenecks that exacerbate human suffering and increase relief costs. Current practices treat HADR supply chains as decoupled, temporary supply chains. In other words, participants come together when a disaster occurs and then go their separate ways once the disaster relief efforts are over. Better transparency and understanding is needed to provide more holistic decision-making capabilities between organizations to provide a more stable HADR infrastructure creating a “borderless” HADR supply chain (Fawcett and Fawcett, 2013). Borderlessness implies that disaster relief begins before a disaster occurs and that participants belong to a virtual HADR team. Further collaborative research is needed to help understand the nuances in play as HADR players transition from temporary supply chain relief

efforts to a synchronized, “borderless” HADR supply chain network resulting in more effective relief efforts, lowering suffering and costs.

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