

Spring 2014

# Organizational Identification and Supply Chain Orientation: Examining a Supply Chain Integration Paradox

Jessica L. Robinson

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ORGANIZATIONAL IDENTIFICATION AND SUPPLY CHAIN ORIENTATION:  
EXAMINING A SUPPLY CHAIN INTEGRATION PARADOX

by

JESSICA L. ROBINSON

(Under the Direction of Karl B. Manrodt)

ABSTRACT

The current approach to operationalizing supply chain management relies on the premise that there are stages in which an organization extends internal integration to external integration by means of implementing integrative mechanisms. Although important developments have been made in identifying the common antecedents and practices for achieving internal integration and external integration, complex relational behaviors as well as integration barriers that occur within an organization, and their solutions, are the next phase to understand and integrate supply chains. Accordingly, given the internal-to-external implementation approach to supply chain integration, this dissertation examines the Social Identity construct, organizational identification, as a source of relational supply chain integration barriers that originates within an organization and evaluates supply chain orientation as a solution that will mitigate this source of relational barriers.

This dissertation involves a survey approach and structural equation modeling procedures to test three theoretically grounded hypotheses: (H1) Achieved internal integration has a positive effect on organizational identification; (H2) Organizational identification has a negative effect on achieving supplier integration; and (H3) Supply chain orientation mitigates the negative effect that organizational identification has on achieved supplier integration (i.e., negatively moderates). Specifically, partial least squares structural equation modeling is the main analysis technique to test the hypotheses while post hoc analysis entails covariance based structural equation modeling.

The hypothesis tests suggest that achieved internal integration increases the tendency of organizational identification; organizations perceive supplier integration as a condition that will benefit an organization; and organizational identification and supply chain orientation are discrete phenomena that occur within an organization that yield a significant positive effect on achieved supplier integration. Lastly, the post hoc analysis indicates organizational identification partially mediates the positive effect achieved internal integration has on achieved supplier integration.

Although this dissertation sought out to identify a source of relational behavioral barriers of supply chain integration that originates within an organization and then to offer a solution that mitigates the source of the relational behavioral barriers of supply chain integration, the primary academic and managerial contributions of this research is identifying two discrete phenomena that benefit the organization as well as facilitates supply chain integration.

INDEX WORDS: Supply chain integration, Achieved integration, Integrative behavioral barriers, Social Identity Theory, Organizational identification, Supply chain orientation

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B.S., Central Michigan University, 2002

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A Dissertation Submitted to the Graduate Faculty of Georgia Southern University

in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

STATESBORO, GEORGIA

2014

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May 2014

## ACKNOWLEDGEMENTS

Over the past three years I have received encouragement and support from a number of individuals. First, I would like to thank my dissertation committee members: Dr. Karl Manrodt, Dr. Monique Murfield, Dr. Christopher Boone, and Dr. Paige Rutner for their time and guidance over the past year as I moved from an idea to a completed study. I would like to give a special thanks to Dr. Karl Manrodt for always reminding me to “keep my priorities in line” and making me promise to take time off once in awhile. A special thank you is owed to Dr. Rodney Thomas for being my mentor for the entire time I was earning my doctorate at Georgia Southern. His friendship has made this a thoughtful and rewarding journey. I am also eternally thankful for Dr. Robert Cook and Dr. Paul Skilton for their valuable guidance over the years. I would also like to recognize my cohort members (sister and brothers), Heather Monteiro, Dion Harnowo, Mertcan Tascioglu, Willis Mwangola, and Stephen Spulick for their encouragement. All our shenanigans will not be forgotten! I also appreciate the first cohort for their advice, insight, and friendship.

To my loving husband, Craig Robinson, I find it difficult to put into words my feelings of gratitude - words seldom go quite deep enough when this level of thank you should be expressed. His unwavering commitment to our marriage and willingness to make great sacrifices (e.g., living across the country from each another), so that I could accomplish my life-long goal, brings me to tears. I am forever grateful to my parents, Patrick and Susan Shick, for raising me to be a person that makes a habit of beating the odds. I am also thankful for the understanding from my family, friends, and furry children for every time I had to say, “Sorry... I’m too busy” and for the gestures that made me feel loved and motivated (Dr. Amanda Christensen, Wendy Robinson, Suzy Reed, Stetler family, Bob and Amy Barrali, Ryan and Katherine Frank, Bo and Bilge Gregory, Phil and Sandy Gaiser, Cassie, Cody, Chloe, George, Kali, Jackson, and Grace).

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## CHAPTER 1

### INTRODUCTION

In the last two decades, supply chain management has established itself as a fundamental intra- and inter-organizational business model that facilitates efficient and coordinated flows of materials, services, finances, and/or information within and across supply chain partner firms and is responsible for effective and cooperative business relationships (Mentzer et al. 2001; Fawcett and Magnan 2002). Accordingly, supply chain management is overwhelmingly recognized as a source of a sustainable competitive advantage (Li et al. 2006). Operationalizing supply chain management is achieved by means of integration, in which researchers have described supply chain management implementation as the extension of internal integration to external integration (Bowersox and Closs 1996; Mentzer et al. 2001). Researchers have also reported that integration in and of itself improves both firm and supply chain performance (Mackelprang et al. 2014).

Considering that supply chain management encompasses integration and that integration improves performance, the integration concept is acknowledged as a multi-faceted phenomenon worthy of continued academic research (Frohlich and Westbrook 2001; Mentzer et al. 2001; Mackelprang et al. 2014). Despite the substantial developments in understanding the integration concept, several gaps remain in the supply chain management literature and managers continue to struggle with integrating (Fawcett and Magnan 2002). Thus, this research addresses a number of the literature gaps and provides managerial guidance with regards to supply chain integration.

Supply chain integration entails a set of three or more entities that are directly involved in the value-adding processes required to achieve efficient and effective upstream and downstream flows of products, services, finances, decisions, and/or information from a source to a customer (Mentzer et al. 2001, p. 4; Zhao et al. 2008, p. 7). There are two distinct organizational boundary

dimensions that comprise supply chain integration (Schoenherr and Swink 2012). First, internal integration occurs between departments within the boundaries of a focal organization (Ellinger, Daugherty and Keller 2000). Second, external integration occurs between a focal organization and an external supply chain member (Frohlich and Westbrook 2001). External integration is dyadic in that it generally represents either supplier integration or customer integration (Flynn, Huo and Zhao 2010). Accordingly, internal, supplier, and customer is the commonly recognized integrative triad that comprises supply chain integration (Schoenherr and Swink 2012).

The extant literature has largely accepted the supply chain management recommended approach to implement supply chain integration (i.e., Bowersox and Closs 1996) in that internal integration should be implemented and achieved prior to pursuing external integration (Stevens 1989; Narasimhan and Kim 2001; Pagell 2004). This implementation approach to supply chain integration (i.e., internal and then external) is frequently reported and observed in practice (e.g., Fawcett and Magnan 2002; Gimenez and Ventura 2005). The intuitive logic is internal functions should be coordinated prior to coordinating external functions (Stevens 1989). Moreover, several empirical studies have supported the hypothesis that internal integrative strategies and structures facilitate external integration (Zhao et al. 2011). Given the additional performance justifications (i.e., Germain and Iyer 2006; Schoenherr and Swink 2012), this internal-to-external approach has largely gone unchallenged despite empirical evidence that external integration yields a positive effect on achieving internal integration when accounting for the necessary integrative behaviors (e.g., Stank, Keller and Daugherty 2001; Gimenez and Ventura 2005; Sanders and Premus 2005).

In addition to recommending an internal-to-external approach to implement supply chain integration, the literature has identified key antecedents of internal integration and external (i.e., supplier and customer) integration. For example, antecedents of internal integration include top

manager support, cross-functional teams, training/education programs, mutual goals, empowered employees, aligned measurement/reward systems, interpersonal communication, proximity, and information systems (Mollenkopf et al. 2000; Pagell 2004). Antecedents of supplier integration are visible managerial support to supplier relationships, supplier development/training/resources, investments, cross-organizational teams and problem solving, information sharing, and supplier evaluation/reward systems (Das et al. 2006; Eltantawy et al. 2009). Key antecedents of customer integration include two-way information sharing, incorporating customer input, manager support, managing relationships, measuring/reporting performance, cross-functional teams, and customer-specific investments (Morash and Clinton 1998; Zhao et al. 2008). As demonstrated from this brief literature summary, developments and understanding of integrative antecedents attempt and nearly resemble the theoretical supply chain management ideology (Fawcett and Magnan 2002).

In addition to identifying antecedents, researchers have identified barriers of internal and external integration. For example, both internal and external integration research demonstrates that employees often challenge modifications to organizational strategies and tactical/operational activities and top managers are hesitant to make structural changes due to the required substantial financial and time investments (Kahn and Mentzer 1998; Stank, Daugherty and Ellinger 1999; Frohlich 2002; Villena, Gomez-Mejia and Revilla 2009). Accordingly, since the most common recommendations to counter the internal and external integration barriers are parallel to the key integration antecedents, researchers have acknowledged that the extant literature has offered little insight or managerial guidance beyond traditional recommendations (Richey et al. 2010). This is especially problematic for managers that contend with behavioral barriers (i.e., collaboration), in which the difficulty with collaboration is that behaviors are voluntary and do not lend themselves to be mandated, formalized, or programmed (Ellinger et al. 2000).

Considering the current state of the supply chain integration literature, complex factors that affect relational behaviors are emerging as the next phase to understand and integrate supply chains (Cousins and Menguc 2006; Petersen et al. 2008; Zhao et al. 2008). This growing need to identify and examine sources of relational behavioral barriers of supply chain integration is also echoed by managers via qualitative studies (e.g., Mentzer, Foggin and Golicic 2000; Fawcett and Magnan 2002; Ellinger, Keller and Hansen 2006; Richey et al. 2010). In a similar vein, scholars have called for research that focuses on internal barriers of supply chain integration since firms can control and manage these factors (i.e., Richey et al. 2009) as well as for research that offers a new perspective to mitigate supply chain integration barriers (i.e., Richey et al. 2010). Thus, the objective of this dissertation is to identify and examine a source of relational behavioral barriers of supply chain integration that originates within a focal organization and to offer a solution that mitigates the source of the relational behavioral barriers of supply chain integration.

The theoretical lens in which this dissertation research intends to identify and examine a source of relational behavioral barriers of supply chain integration that originates within a focal organization is Social Identity Theory (SIT) (Tajfel 1974). The primary theoretical construct of interest is organizational identification (March and Simon 1958). Organizational identification is “the perception of oneness with or belongingness to an organization where the individual defines him or herself at least partly in terms of their organizational membership” (Mael and Ashforth 1992, p. 109). Antecedents of organizational identification include sharing goals and/or threats, interpersonal interactions, teamwork, proximity, common history, similarity, prestige, liking, and distinctiveness (Ashforth and Mael 1989; Richter et al. 2006) and are noticeably parallel to many of the internal integration antecedents (i.e., Mollenkopf et al. 2000; Pagell 2004). According to SIT, organizational identification may be linked to greater interdepartmental cohesion, altruism,



cooperation, and favorable interdepartmental evaluations (Ashforth and Mael 1989; Corsten, Kucza and Peyinghaus 2006) as well as responsible for adverse inter-organizational behaviors, including outbreaks of conflict, rivalry, competition, and hostile attitudes (Richter et al. 2006). Considering the advocated internal-to-external approach to implement supply chain integration, organizational identification is identified as a source of relational behavioral barriers of supply chain integration that originates within a focal organization, in which this research will examine.

Given that organizational identification is identified as a source of relational behavioral barriers of supply chain integration that originates within a focal organization, this dissertation introduces Supply Chain Orientation (SCO) as a means to mitigate this source of the relational behavioral barriers of supply chain integration. Specifically, SCO refers to the “implementation of SCM philosophy in individual firms in a supply chain” (Min and Mentzer 2004, p. 67) where a SCM philosophy is a “systems approach to viewing the supply chain as a single entity, rather than as a set of fragmented parts, each performing its own function” (Mentzer et al. 2001, p. 7). Conceptually, SCO encompasses strategic elements (i.e., credibility, benevolence, commitment, top management support, norms, and compatibility) and structural elements (i.e., organizational design, information technology, human resources, and organizational measurement) (Esper, Defee and Mentzer 2010). A key distinction is that SCO focuses on the higher order future implications (i.e., supply chain integration), while an internal or external integration approach focuses on the management processes and activities that are required to either internally or externally integrate (Bowersox and Closs 1996; Mentzer et al. 2001; Min and Mentzer 2004; Esper et al. 2010).

In summary, justification for this dissertation research is derived from three central topics in which gaps in the supply chain management literature require attention in order to enhance the current academic understanding of the integration concept and to provide managerial guidance in

achieving supply chain integration. The first central topic relates to the generally unchallenged supply chain management approach to implementing supply chain integration (i.e., internal-to-external). The second central topic is identifying and examining a source of relational behavioral barriers to achieving supply chain integration that originates within the boundaries of a focal firm (i.e., organizational identification). The third central topic is incorporating the role of SCO when implementing supply chain integration in order to mitigate the source of the relational behavioral barriers (i.e., successfully achieve supply chain integration) as well as to incorporate a theoretical supply chain management ideology within a supply chain integration context.

### Research Purpose and Questions

The objective of this dissertation research is to identify and examine a source of relational behavioral barriers of supply chain integration that originates within a focal organization and to offer a solution that mitigates the source of the relational behavioral barriers of supply chain integration. This research also intends to address three central topics (i.e., gaps within the supply chain management literature that affect supply chain integration) by means of a SIT framework. Thus, the overarching purpose of this dissertation is to examine the SIT construct, organizational identification, within a supply chain management context. To clarify, although this dissertation intends to focus on organizational identification as an internal source of the relational behavioral barriers of supply chain integration, the context in which the phenomenon will be examined is supply chain management. Rationalization for this supply chain management context is based on framing this research with a theoretical supply chain management framework (e.g., introducing SCO as a means to mitigate the anticipated negative external relational behaviors that originate from organizational identification) (Mentzer et al. 2001; Fawcett and Magnan 2002).

The supply chain management context determines the scope of this dissertation. The first consideration in which a supply chain management context determines the scope of this research relates to supply chain integration implementation approaches. For example, while it is possible that organizations implement supply chain integration by first achieving external integration and then pursuing internal integration, the scope of this research is limited to examining the generally adopted supply chain management approach to implement supply chain integration (i.e., internal-to-external) (Stevens 1989; Bowersox and Closs 1996; Narasimhan and Kim 2001; Pagell 2004).

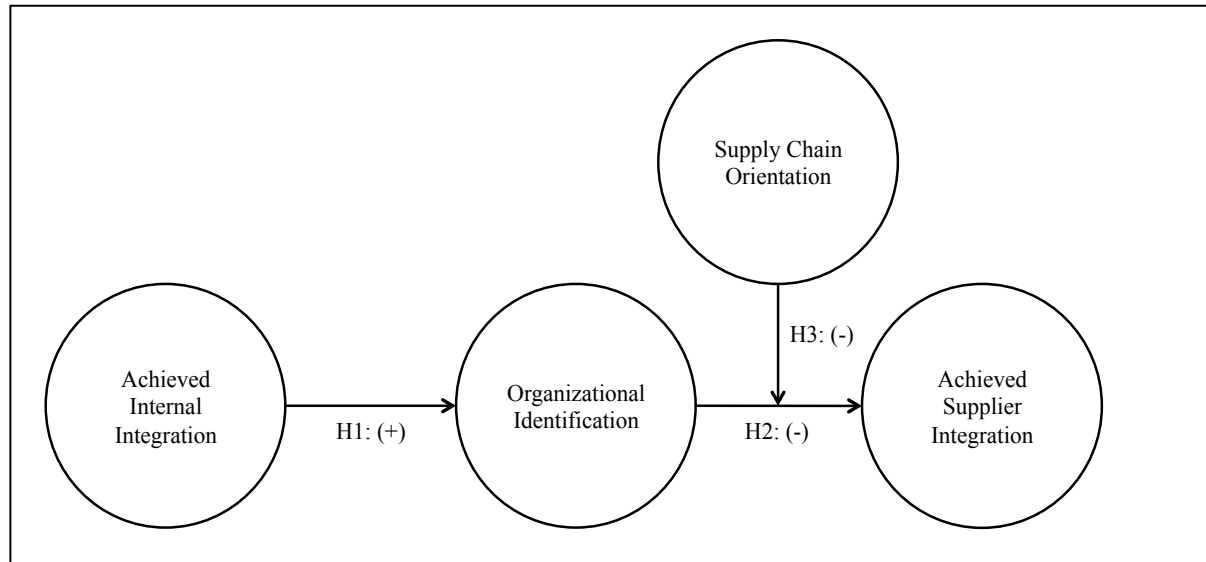
The second consideration in which a supply chain management context determines the scope of this dissertation research relates to the external dimension of supply chain integration. Specifically, although a supply chain is generally represented as “a set of three or more entities” (Mentzer et al. 2001, p. 4), supply chain management scholars have acknowledged that dyads are generalizable to an entire supply chain when examining relational phenomena (Autry and Griffis 2008) and are an accepted unit of analysis for supply chain management (Soni and Kodali 2011) and supply chain integration research (Frohlich and Westbrook 2001; Germain and Iyer 2006; Flynn et al. 2010). Thus, based on the general consensus that buyer-supplier dyadic relationships are fundamental to supply chain management (Chen and Paulraj 2004), this research is limited to examining supplier integration as a proxy for the external dimension of supply chain integration.

Given the purpose and the context/scope of this dissertation, three relationships are of particular interest. Accordingly, these relationships provide the basis for the research questions:

1. Does achieving internal integration have an effect on organizational identification?
2. Does organizational identification have an effect on achieving supplier integration?
3. Does supply chain orientation mitigate (i.e., negative moderate) the effect organizational identification has on achieving supplier integration?

The goal of this dissertation will be answering the three specified research questions that form the testable conceptual model. Figure 1 illustrates the proposed conceptual model.

Figure 1. Proposed Conceptual Model



### Research Design and Analytical Techniques

In addressing the specified research questions, this dissertation intends to operationalize a quantitative research design in order to test the direct as well as the moderating effects among the four constructs of interest (i.e., achieved internal integration, organizational identification, supply chain orientation, and achieved supplier integration). Accordingly, this section of chapter one is dedicated to briefly summarizing the intended research design (i.e., data collection approach and analytical techniques) while chapter three is dedicated to specifying a more detailed account.

The population of interest for this dissertation is organizations that are engaged in supply chain integration (i.e., internal-to-external implementation approach) and random sampling will be performed so that the results are generalizable to the population (Kelley et al. 2003). Based on rigorous criteria, approximately 200 usable surveys will be collected via Qualtrics software

and panel data management (Cohen 1992; Chin, Marcolin and Newsted 2003; Hair et al. 2014). A key informant that holds an operations middle-management position (e.g., materials manager, senior buyer, and operations manager) is an ideal respondent since such an individual is likely the most knowledgeable of the current state of integration and able to represent the views of the organization (Narasimhan and Das 2001; Keh and Xie 2009). Finally, a number of proactive common method bias procedures (i.e., minimizing threat) and assessment tests will be performed (Podsakoff and Organ 1986; Podsakoff et al. 2003; Jayamaha, Grigg and Mann 2008).

The intended analysis procedures are based on the partial least squares structural equation modeling (PLS-SEM) technique<sup>1</sup> and are classified into three discrete stages. First, a number of preliminary data assessments will be performed. Specifically, following the recommendations for a PLS-SEM reflective measurement model, the issues that will be addressed include biases (i.e., common method, nonresponse, and single respondent), suspicious response patterns, univariate outliers, data distribution and multicollinearity (Hair et al. 2010; Kline 2011; Hair et al. 2014). Second, the PLS-SEM model estimation and interpretation approach begins with evaluating the measurement model, which involves assessing the reliability and validity of measurement items (Garver and Mentzer 1999; Aibinu and Al-Lawati 2010). Third, the final two steps in performing PLS-SEM model estimation and interpretation involves evaluating the explanatory power of the structural model and testing the hypotheses (Aibinu and Al-Lawati 2010; Hair et al. 2014).

### Intended Research Contributions

This research makes a number of contributions. The first overarching contribution of this dissertation is extending supply chain integration understanding by identifying and examining a source of relational behavioral barriers of supply chain integration that originates within a focal

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<sup>1</sup> A post hoc analysis is also conducted by means of covariance-based structural equation modeling (CB-SEM)

organization as well as offering a solution that mitigates the source of the relational behavioral barriers of supply chain integration. Specifically, this dissertation answers a call for research that focuses on the internal barriers of supply chain integration (i.e., Richey et al. 2009) and a call for research that offers a new perspective to minimize supply chain integration barriers (i.e., Richey et al. 2010). Finally, this dissertation research contributes to the current supply chain integration understanding by examining a complex phenomenon that affects relational behaviors, which has been identified by several researchers as the next phase to understanding and integrating supply chains (e.g., Cousins and Menguc 2006; Petersen et al. 2008; Zhao et al. 2008).

The second overarching contribution of this dissertation research is incorporating one of the fundamental theoretical supply chain management ideologies as an approach to successfully achieve supply chain integration (Mentzer et al. 2001; Fawcett and Magnan 2002). Specifically, although SCO has yet to be explicitly examined with regards to implementing and successfully achieving supply chain integration, Mentzer et al. (2001) delineated the antecedent role of SCO with an internal-to-external approach to implement supply chain integration. This dissertation, therefore, is grounded by theoretical underpinnings of supply chain management and contributes to the much-needed development of supply chain management theory (Chen and Paulraj 2004; Storey et al. 2006; Stock, Boyer and Harmon 2010).

The third overarching contribution of this dissertation is introducing and examining the theoretical construct, organizational identification, as it relates to implementing and achieving supply chain integration. Although researchers have incorporated the identification phenomenon in a supply chain management context, this dissertation research is fundamentally different and offers additional contextual and theoretical insight. Contextually, this research differs from the notable work of Min, Kim and Chen (2009) as well as Corsten, Gruen and Peyinghaus (2011) by

focusing on the integration aspect of supply chain management and introducing the identification phenomenon as a source of relational behavioral barriers rather than advocating the identification phenomenon as a promising relational concept. Theoretically, this dissertation research differs from both Min et al. (2009) and Corsten et al. (2011) in that overwhelming SIT research suggests that individuals are more likely to identify with lower order identities than higher order identities (Ashforth, Harrison and Corley 2008). As it relates to the current supply chain management context this translates to individuals are likely to identify with their own organization (i.e., lower order) rather than with an external supply chain partner firm (i.e., Corsten et al. 2011) or with an entire supply chain (i.e., Min et al. 2009) (i.e., higher order). Therefore, this dissertation research is consistent with the SIT theoretical framework and introduces a lower order perspective of the identification phenomenon within a supply chain management context.

The fourth overarching contribution of this dissertation research is extending the SIT and the identification literature by identifying and examining additional antecedents of organizational identification (i.e., achieving internal integration) (Ashforth, personal communication, December 14, 2012). Given that organizational identification has been linked to lower employee turnover, higher employee motivation, greater job satisfaction, and other valuable organizational behaviors (Cardador and Pratt 2006), this contribution is not limited to supply chain management research. Specifically, domains with long-standing interest in organizational identification antecedents are management (Ashforth et al. 2008), organizational behavior (Meyer and Allen 1991), marketing (Cardador and Pratt 2006), and psychology (Mael and Ashforth 1995).

Finally, it should also be acknowledged that all four of the described contributions either directly or indirectly serve managers with regards to their supply chain integration efforts. The most significant contribution to supply chain managers is that, not only does this dissertation

research identify a likely source of relational behavioral barriers of supply chain integration that originates within a focal organization, but it also identifies a likely solution to mitigate the source of the barrier. Thus, additional operational and academic contributions of this dissertation are answering calls for providing managers with a systematic integrative approach and doing this by merging strategic planning and tactical implementation (Ellinger et al. 2006; Flynn et al. 2010).

### Dissertation Organization

This dissertation is divided into five distinct chapters. Chapter 1 delineates the state of the literature and introduces the phenomena to be examined within the supply chain management context. Accordingly, derived from gaps in the contextual and theoretical literature, this chapter provides justification for this dissertation research, states the overarching purpose, identifies the research questions, introduces the proposed conceptual model, delineates the intended research design and analytical techniques, and acknowledges the contributions of this research. Chapter 2 is dedicated to reviewing the supply chain management, supply chain integration, and theoretical literature. The second chapter also includes developing the hypotheses that will be empirically tested. Chapter 3 outlines the intended research methodology in greater detail. Specifically, this chapter outlines the research design with regards to the data collection, model development, data analysis techniques, and hypothesis testing. The purpose of Chapter 4 is to report and summarize the research findings, in which the discussion entails the procedures for assessing the preliminary data, evaluating the measurement and structural models, interpreting the hypothesis test findings, and delineating the results of a post hoc analysis. Finally, Chapter 5 concludes this dissertation with discussing the managerial and academic implications, identifying the research contributions, recognizing the limitations of this research, and offering future research directions.



## CHAPTER 2

### LITERATURE REVIEW

The overarching purpose of this chapter is to delineate the main concepts being examined by this dissertation and to provide a comprehensive discussion of the relevant literature in order to develop logical and theoretically sound testable hypotheses. This second chapter is organized as follows. First, the internal, supplier, customer, and supply chain integration literature will be summarized, in which two subsections each summarize a distinct perspective of the integration concept. Second, the supply chain orientation body of literature will be summarized. The supply chain literature review will conclude with a summary that identifies gaps in the literature. Third, the theoretical literature will be reviewed and key theoretical features will be highlighted. Lastly, this second chapter will conclude by developing the hypotheses that will be empirically tested.

#### Integration Literature

The integration concept has been defined, operationalized, and conceptualized in several different ways (Pagell 2004; Chen, Daugherty and Roath 2009; Turkulainen and Ketokivi 2012). For example, one perspective refers to integration as processes, mechanisms, and techniques that are associated with implementing the integration concept (Jüttner, Christopher and Godsell 2010; Turkulainen and Ketokivi 2012). The second perspective of the integration concept is an achieved organizational state of being (Chen et al. 2010; Turkulainen and Ketokivi 2012). Appendix A and Appendix B provide a representative sample of definitions across supply chain management, logistics, marketing, and operations domains for both of the integration concept perspectives (i.e., Appendix A are processes, mechanisms, and techniques definitions and Appendix B are achieved organizational state definitions) for internal, supplier, customer, and supply chain integration.

Considering that both perspectives of the integration concept have implications for this dissertation, the first literature review subsection delineates the mechanisms (i.e., processes and techniques) associated with (1) organizational structures and (2) strategic policies and tactical/operational activities. Specifically, given these two key categories of integrative implementation efforts, the common integrative mechanisms will be summarized in broad terms and followed with a discussion of the specific implications and barriers associated with internal and external integration efforts. The second integration literature review subsection summarizes a growing body of literature that examines the integration concept as an achieved organizational state.

### *Integrative Mechanisms*

The first overarching classification of integrative implementation considerations relates to organizational structures (Stevens 1989), which involves decisions associated with patterns of authority, communication, and relationships (Stank, Daugherty and Gustin 1994). These three decision-making dimensions of organizational structure have been approached by the integration literature (i.e., internal, external, and supply chain) through the lens of reporting, systems, and grouping (Pagell 2004). Accordingly, this literature review subsection is organized as follows. Three paragraphs are dedicated to defining and broadly summarizing literature that is associated with the concepts of reporting, systems, and grouping. These three summary paragraphs are then followed by supplemental paragraphs that detail the specific implications and barriers that relate to internal integration and external integration implementation efforts.

Reporting refers to the organizational structure of information sharing that facilitates and complements decision-making (Daft and Lengel 1986; Roth 1992). In terms of reporting, much of the integration literature has examined two dimensions of this organizational structure, namely

formalization and centralization (Stank et al. 1994). Formalization and centralization have been described as the managerial controls that guide decision-making (Ayers, Dahlstrom and Skinner 1997). First, formalization represents the degree of governance (i.e., policies, procedures, and rules) imposed on decisions, activities, and processes (Stank et al. 1994; Mollenkopf et al. 2000; Min et al. 2005; Garrett, Buisson and Yap 2006). Second, centralization refers to the extent and location that decision-making authority is dispersed throughout an organization and supply chain (Stank et al. 1994; Mollenkopf et al. 2000; Defee and Stank 2005).

The implications and recommendations associated with formalization and centralization are somewhat inconsistent and vague across the internal and external integration literature. For example, although researchers have advocated that formalization has a valuable role for internal integration efforts by organizing and detailing responsibilities and requirements, mixed evidence suggests that formalization may hinder internal integration by deterring employee empowerment and reducing flexibility (Mollenkopf et al. 2000; Garrett et al. 2006). The external integration literature also acknowledges that formalization is an approach to organize complex processes and establish procedures (Germain, Claycomb and Dröge 2008). However, while formalization has been found to hinder internal integration, evidence suggests that formalization facilitates external integration by establishing trust and collaboration (Ragatz, Handfield and Scannell 1997; Min et al. 2005). A general consensus has yet to be reached regarding the effects de/centralization have on integrative efforts. For example, internal and external integration research has concluded that decentralization contributes to integration by encouraging collaboration and information sharing (Gupta and Wilemon 1988; Kahn and Mentzer 1996; Patnayakuni, Rai and Seth 2006). However, centralization may also assist internal and external integrative efforts by coordinating efforts and aligning motives (Hill, Hitt and Hoskisson 1992; Stank et al. 1994; Kim 2006). In sum, the most

effective formalization and centralization reporting structures should be determined by strategies and environmental factors (i.e., SSP paradigm) (Chow, Henrikssen and Heaver 1995; Defee and Stank 2005). Therefore, the next overarching organizational structure relates to systems.

Systems refer to information, measurement, and reward (Pagell 2004). First, information systems are often implemented as a means to process data from various sources and to provide greater managerial access to decision-making information (Gustin, Daugherty and Stank 1995; Rodrigues, Stank and Lynch 2004). The main contribution of an integrated information system is the amount and the richness of information that assists managerial decision-making to improve coordination and control (Daft and Lengel 1986; Closs, Goldsby and Clinton 1997; Barratt and Barratt 2011). Second, measurement systems and reward systems are complementary integrative structures (Pagell 2004). Specifically, measurement systems provide an agreed upon expectation of performance while reward systems are the means by which performance metrics are converted into incentives (Bowersox, Closs and Stank 2000). An effective integrated measurement system encourages operational synchronization by integrating performance metrics and providing timely unified feedback (Rodrigues et al. 2004), whereas effective integrated reward systems encourage cooperative efforts by establishing a sense of shared benefits and risks (Murphy and Poist 1992).

There is an overwhelming consensus that information systems are a necessary structure to implement and achieve internal integration (Gustin et al. 1995; Pagell 2004), supplier integration (Ragatz et al. 1997; Gunasekaran and Ngai 2004), customer integration (Closs and Savitskie 2003; Piller, Moeslein and Stotko 2004), and supply chain integration (Narasimhan and Kim 2001; Kim and Lee 2010). Despite the key role of integrated information systems, employee resistance is a common obstacle for both internal and external integration (Joshi 1991). Moreover, although substantial information system investments (i.e., financial and time) may hinder both internal and

external integration, these resource dedications are greater barriers to external integration since organizations perceive such investments as valuable only in the context of that particular external supply chain relationship (Stank et al. 1999b; Villena et al. 2009).

Similar to information systems, there is an overwhelming consensus that properly aligned measurement and reward systems are necessary structures in order to successfully implement and achieve internal integration (Murphy and Poist 1992; Pagell 2004), supplier integration (Ragatz et al. 1997; Das et al. 2006), customer integration (Zhao et al. 2008; Wong et al. 2012), and supply chain integration (Bowersox et al. 2000; Min et al. 2005). Specifically, to have a positive effect on internal integration, the interdepartmental measurement and reward systems must be aligned with the strategic organizational goals and objectives (Bititci, Turner and Begemann 2000; Pagell 2004). Accordingly, while aligning measurement and reward systems is a formidable challenge for internal integration, it is often more difficult to align measurement and reward systems across organizational boundaries (Lambert and Pohlen 2001; Fawcett and Magnan 2002). Specifically, challenges that are associated with external integrated measurement and reward systems involve complexities of identifying each organization's involvement and contribution (van Hoek 1998), supply chain members must understand their role within the entire supply chain process (Stank et al. 2001a), difficulties associated with the boundary-spanning performance evaluations (Beamon 1999), and an overall general reluctance to accept the reward sharing concept (Wong et al. 2012). Given this summary and detailed discussion of the three types of systems, the final overarching organizational structure to be discussed in view of integrative efforts is the concept of grouping.

Grouping refers to assembling individuals that are responsible for interdependent tasks into a collective and differentiated work unit (Cummings 1978). The concept of grouping (i.e., facility layout) originates from the operations management literature in which strategic decisions

that are associated with facility layout designs have traditionally focused on minimizing material handling costs (Meller and Gau 1996). Nonetheless, interpersonal communication and relational considerations are increasingly shaping decisions that are involved with grouping and proximity organizational structures (Pinto et al. 1993; Van den Bulte and Moenaert 1998).

Grouping has been recognized as having a role in achieving internal integration (Pagell 2004). The logical justification for connecting grouping with facilitating internal integration is derived from a body of teamwork research that indicates closer physical proximity is a means for frequent interpersonal communication and establishing a cooperative environment (Pinto et al. 1993; Pagell and LePine 2002; Pagell 2004). Specifically, researchers have reported that closer proximity is an antecedent to internal integration by allowing individuals to meet face-to-face to discuss complex and urgent problems (Pagell 2004; De Snoo, Van Wezel and Wortmann 2011) as well as a means to improve operational coordination via collaborative relationships created by greater interpersonal accessibility (Mollenkopf et al. 2000; De Snoo et al. 2011). Conversely, greater interdepartmental distance has been identified as an organizational structure that creates a functional silo barrier mentality, physically and emotionally divides functional departments, and contributes to what has been coined as the ‘Great Operating Divide’ (Song et al. 1996; Bowersox, Closs and Stank 2000; Fawcett and Magnan 2002). Although proximity has been advocated to achieve external integration, greater globalization and supply chain complexity are fundamental barriers to implement a grouping structure and to capitalize on the interpersonal relationships and collaborative behaviors (Sinkovics and Roath 2004; Roth et al. 2008).

In summary, the above discussion has been dedicated to the three overarching categories of organizational structures associated with integration implementation efforts. First, a reporting structure encompasses formalization and centralization decisions (Stank et al. 1994). Although

the literature acknowledges benefits of formalized and centralized structures, empirical evidence suggests that informal/decentralized is appropriate for internal integration and formal/centralized is appropriate for external integration (Kahn and Mentzer 1996; Mollenkopf et al. 2000; Yu, Yan and Cheng 2001; Min et al. 2005). Second, there is a consensus as to the valuable role systems (i.e., information, measurement, and reward) have in achieving internal and external integration (e.g., Ragatz et al. 1997; Pagell 2004; Min et al. 2005; Wong et al. 2012). The main difference between internal and external implementation efforts in view of all three systems are the greater difficulties/barriers associated with external integration efforts (Stank et al. 1999b; Lambert and Pohlen 2001; Fawcett and Magnan 2002; Villena et al. 2009). Third, although grouping is a facilitator of internal integration, the very design of supply chains makes grouping an impractical external integration implementation structure (Pagell 2004; Sinkovics and Roath 2004; Roth et al. 2008). Therefore, given this review of the fundamental integrative organizational structures, this literature review turns to the fundamental strategic policies and tactical/operational activities.

The second overarching classification of internal and external integrative implementation considerations relates to strategic policies and tactical/operational activities (Stevens 1989). In reviewing the literature, four overarching recommendations emerged as the commonly accepted policies and activities associated with achieving internal and external integration. Specifically, the broad implementation approaches involve the role of management, cross-training programs, establishing teams, and information sharing. Thus, the below discussion and literature review is organized as follows. Four paragraphs are dedicated to defining and broadly summarizing the literature associated with the role of management, cross-training programs, establishing teams, and information sharing. These four summary paragraphs are then followed by supplemental paragraph/s that detail specific implications that relate to internal and external integration efforts.

The role of managerial support and commitment to integration implementation efforts are well documented in the internal and external integration literature (e.g., Daugherty, Ellinger and Gustin 1996; Ragatz et al. 1997; Mollenkopf et al. 2000; Pagell 2004; Van Hoek, Ellinger and Johnson 2008; Eltantawy et al. 2009; Chen et al. 2010). Specifically, researchers have expressed management as an enabler of integration efforts (e.g., Murphy and Poist 1992; Wong et al. 2012) and a potential barrier to integration efforts (e.g., Bals, Hartmann and Ritter 2009; Richey et al. 2010). The general theme with regards to the role of management in implementing internal and external integration is behavioral in nature. For example, a consensus within the literature and among supply chain managers is that collaboration often depends on the involvement and actions of managers to establish such a culture (Mentzer et al. 2000; Stank, Keller and Daugherty 2001; Fawcett and Magnan 2002; Hammer 2004; Ellinger et al. 2006). Establishing a collaborative culture falls under managerial responsibilities across the hierarchical levels. Thus, the below two paragraphs discuss the role of top managers and middle/frontline managers, respectively.

The role top management has with regards to internal and external integration efforts is to establish mutual goals and performance objectives, communicate the benefits and emphasize the importance of integrating, delegate responsibility and identify roles for implementing integration, demonstrate strategic supply chain management skills, internally market integrative ideas and philosophies, and lead by example via supporting organizational values and orientations (George 1990; Murphy and Poist 1992; Jaworski and Kohli 1993; Daugherty et al. 1996; Mentzer, Min and Zacharia 2000; Mollenkopf et al. 2000; Pagell 2004; Mohr-Jackson 2005; Eltantawy et al. 2009). Although these roles are essentially parallel for both internal and external integration, a responsibility specific to external integration relates to investing in shared resources, which is a signal of inter-organizational commitment (Jap 1999; Min et al. 2005; Cao and Zhang 2011).



Although top managers have a role in establishing a collaborative and integrative culture, researchers have acknowledged that managers throughout an organization are required to exhibit “buy in” behavior in order to achieve internal and external integration (Daugherty, Ellinger and Gustin 1996). This is based on the influence that middle managers and frontline managers have on employee morale, in which horizontal coordination is generally more effective and accepted than top-down mandates (Kahn and Mentzer 1996; Menon, Jaworski and Kohli 1997). The role that middle managers and frontline managers have in encouraging integrative behavior is referred to as coaching (Ellinger, Ellinger and Keller 2005). Specifically, coaching is described as a daily “hands-on” approach and process of assisting employees as a means to improve performance by capitalizing on their individual capabilities (Orth, Wilkinson and Benfari 1987, p. 67). Although not explicitly acknowledged or examined in the integration literature, researchers have discussed the coaching concept with regards to encouraging both favorable internal and external integrative attitudes (e.g., Daugherty et al. 1996; Mollenkopf et al. 2000; Chen et al. 2010; Ellinger, Keller and Baş 2010; Hirunyawipada, Beyerlein and Blankson 2010).

Training programs are often developed based on the concept of training needs analysis, in which weaknesses are resolved and knowledge, skills, and abilities are developed by establishing a systematic training program (Bowman and Wilson 2008; Ellinger et al. 2010). In this context, cross-training programs are recognized approaches of internal and external integration efforts by improving interdepartmental and inter-organizational coordination (Mollenkopf et al. 2000; Wu et al. 2004). The literature also recognizes cooperative attitudes as an additional benefit of cross-training programs, which originates from a greater understanding of interdepartmental and inter-organizational roles (Gupta and Wilemon 1988a; Ragatz et al. 1997; Mollenkopf et al. 2000; Shub and Stonebraker 2009). Accordingly, given that cross-training programs are equally valuable for

both integration implementation efforts, the following paragraph addresses the implications and barriers that are associated with internal and external integration implementation efforts.

Although training programs are often recommended for internal and external integration implementation efforts (Wagner 2003; Swink, Narasimhan and Kim 2005), internal integration has notable benefits over external integration. For example, internal integration has an additional operational benefit in that interdepartmental assistance is a likely outcome and available resource (Sundstrom, DeMeuse and Futrell 1990; Abrams and Berge 2010). Accordingly, given an event where interdepartmental assistance is provided, the additional attitudinal benefit is facilitating a shared sense of accountability and collaboration (Hurley and Hult 1998). Considering internal integration implementation efforts, researchers have found that interdepartmental cross-training programs (e.g., job rotation) are commonly offered in practice (Pagell 2004). In view of external integration implications, a dedicated training program designed to improve coordination with one supply chain partner is a strategic signal of organizational commitment (Min et al. 2005) as well as is conducting an organizational-specific training program to a supply chain partner (Ragatz et al. 1997). Nonetheless, a number of researchers have acknowledged that such externally focused training programs are seldom observed in practice (Birou and Fawcett 1994; Ragatz et al. 1997; Fawcett and Magnan 2002). The reasoning for few dedicated external-focused training programs is due to high investment costs for that one supply chain relationship (Villena et al. 2009).

A common integration implementation approach is establishing interdepartmental teams for internal integration efforts (Pagell 2004; Germain et al. 2008; Hirunyawipada et al. 2010) and inter-organizational teams for external integration efforts (Mentzer et al. 2000; Paulraj, Chen and Flynn 2006; Hong and Hartley 2011). Although cross-functional teams have historically been used for designated activities or projects (Pinto et al. 1993), the integration literature recognizes

cross-functional teams as a means to establish intra- and inter-organizational cooperation (Swink 1999; Brewer and Speh 2000; Fawcett and Magnan 2002). In particular, cross-functional teams facilitate cooperation through informal communication and interpersonal relationships (Pinto et al. 1993; Pagell 2004; Germain et al. 2008; Hirunyawipada et al. 2010; Hong and Hartley 2011).

The concepts of proximity and sharing risks/rewards are considerable implications when establishing successful interdepartmental and inter-organizational teams. Specifically, given that cross-functional teams are responsible for developing and improving interpersonal relationships based on frequent informal communication and sharing risks/rewards, internal integration efforts often complement cross-functional teams (Pinto et al. 1993; Pagell 2004). Despite the inherent internal integration benefits of establishing successful interdepartmental teams, researchers have also recognized that organizations may hinder interdepartmental relationships and cooperation by imposing too many unnecessary team meetings and failing to develop clear goals and deliverables (Henke, Krachenburg and Lyons 1993; Song et al. 1996; Kahn and Mentzer 1998; Pagell and LePine 2002). Alternatively, external integration efforts that involve cross-functional teams are unable to capture the same benefits as internal integration when taking into account the proximity implications (Knoben and Oerlemans 2006). Also, sharing risks/rewards is a necessary feature of cross-functional teams but a substantial barrier of external integration (Wong et al. 2012). Thus, the final topic of this subsection is discussed next and relates to information sharing activities.

The literature recognizes information sharing as a fundamental aspect of both internal and external integration efforts (Ellinger et al. 2000; Bagchi et al. 2005). Accordingly, there are three overarching information-sharing decisions that relate to both integration implementation efforts. First, modality represents the characteristics of the communication channels that range by degree of interpersonal contact (Mohr and Nevin 1990; Kahn and Mentzer 1996). Second, frequency is

the amount of communication and/or the duration of contact (Farace, Monge and Russell 1977; Mohr and Nevin 1990). Third, content describes the message that is stated when communicating (Mohr and Nevin 1990). The next paragraphs delineate modality, frequency, and content in view of internal and external integration and identify the implications for integration implementation.

The first information-sharing consideration associated with integration efforts is modality. In general, researchers have studied two information-sharing modality approaches that relate to internal and external integration. Specifically, consultation involves bidirectional interpersonal contact (e.g., face-to-face meetings, video conferencing, and telephone calls), while information exchange involves non-personal document sharing (e.g., emailing, memos, and fax) (Kahn and Mentzer 1998; Ellinger et al. 2000). The role bidirectional interpersonal contact has on internal and external integration efforts is facilitating knowledge and improving relationship perceptions; however, empirical work has only supported a positive effect for external integration and either a non-significant or negative effect for internal integration (e.g., Kahn and Mentzer 1998; Ellinger et al. 2000; Rollins, Pekkarinen and Mehtälä 2011; Zacharia, Nix and Lusch 2011). The role that information exchange has on integration efforts is improving coordination and cooperation (Song et al. 1996), in which information exchange generally fails to have a significant effect on internal integration and a positive effect on external integration (Kahn and McDonough 1997; Kahn and Mentzer 1998; Ellinger et al. 2000; Simatupang et al. 2002; Patnayakuni et al. 2006).

The second information-sharing consideration that is associated with integration efforts is frequency. In general, literature suggests that greater information availability enhances internal and external integration efforts (e.g., Murphy and Poist 1992; Gustin et al. 1995; Stank et al. 1999; Mollenkopf et al. 2000; Bagchi et al. 2005). Frequency introduces the notion of informal versus formal information sharing. Specifically, researchers have studied informal information sharing

that occurs frequently and spontaneously as well as formal information sharing that is scheduled intermittently and bureaucratic in nature (e.g., Kahn and Mentzer 1998; Ellinger et al. 2000; Min et al. 2005; Cousins and Menguc 2006). The leading conclusion is frequent informal information sharing facilitates internal and external integration by resolving time-sensitive issues and building relationships (Pagell 2004; Garrett et al. 2006; Petersen et al. 2008; Prajogo and Olhager 2012). However, frequent formal information sharing is counterproductive for internal integration efforts since department managers generally perceive this as inefficient with regards to resource and time management (Gabor 1946; Simon 1959; Pinto and Pinto 1990; Kahn and Mentzer 1998; Ellinger et al. 2000). Frequent formal information sharing facilitates external integration via coordination and relational aspects (Cousins and Menguc 2006; Patnayakuni et al. 2006; Petersen et al. 2008).

The third information-sharing consideration associated with integration efforts is content. In view of integration implementation efforts, content refers to the credibility of information and the amount of information shared. First, credibility of information refers to “the degree to which the receiver believes the information to be undistorted” (Moenaert and Souder 1990, pp. 222-223). While lack of information credibility hinders internal and external integrative efforts by deterring cooperation and facilitating unfavorable perceptions (Gupta and Wilemon 1988a; 1988b), credible information improves internal and external integrative efforts via facilitating trust and favorable perceptions (Mohr and Spekman 1994; Li and Lin 2006). Second, amount of information shared refers to the degree of access to critical and proprietary information (Bagchi et al. 2005; Zailani and Rajagopal 2005). Greater access to information improves internal and external integration through greater transparency and collaboration (Stank et al. 2000b; Kemppainen and Vepsäläinen 2003; Cao and Zhang 2011). Trust is a significant aspect for both credibility of information and amount of information shared (Song et al. 1996; Vokurka and Lummus 2000; Bagchi et al. 2005);

thus, given a trust component, internal integration is more frequently obstructed by credibility of information (e.g., Gupta and Wilemon 1988a; 1988b; Song et al. 1996) while external integration is more frequently obstructed by the limited amount of information shared (e.g., Holmberg 2000; Kemppainen and Vepsäläinen 2003; Bagchi et al. 2005; Castaldo, Zerbini and Grosso 2009).

In summary, the above discussion has described the four overarching recommendations classified as strategic policies and tactical/operational activities that are associated with achieving internal and external integration. Specifically, these implementation approaches include the role of management, training programs, establishing teams, and information sharing. First, the role of management is to signal a unified and visible commitment to integrative efforts, in which tangible investments (e.g., shared resources) and intangible investments (e.g., coaching) are necessary for internal and external integration (Daugherty et al. 1996; Ragatz et al. 1997; Mollenkopf et al. 2000; Pagell 2004; Eltantawy et al. 2009). Second, although cross-training programs have been recommended as having a positive effect on internal and external integration (Mollenkopf et al. 2000; Wagner 2003), internal integration has additional benefits and fewer barriers than external integration when implementing training programs (Hurley and Hult 1998; Fawcett and Magnan 2002; Villena et al. 2009; Abrams and Berge 2010). Third, establishing cross-functional teams in view of internal and external integration implementation are common recommendations (e.g., Mentzer et al. 2000; Pagell 2004; Paulraj et al. 2006; Germain et al. 2008; Hirunyawipada et al. 2010; Hong and Hartley 2011). Despite inherent advantages associated with internal integration and the barriers associated with external integration (Pinto et al. 1993; Pagell 2004; Knoblen and Oerlemans 2006; Wong et al. 2012), cross-functional teams need clear goals and interpersonal information sharing activities (Henke et al. 1993; Song et al. 1996). Fourth, although information sharing is a fundamental feature of internal and external integration (Ellinger et al. 2000; Bagchi

et al. 2005), modality, frequency, and content considerations have an effect on achieving internal integration and external integration (Farace et al. 1977; Gupta and Wilemon 1988a; 1988b; Mohr and Nevin 1990; Pinto and Pinto 1990; Kahn and Mentzer 1996; Kemppainen and Vepsäläinen 2003; Bagchi et al. 2005; Cousins and Menguc 2006; Castaldo et al. 2009; Rollins et al. 2011).

This entire integration literature review subsection has focused on common mechanisms that facilitate integration and the barriers associated with integration implementation efforts. The two overarching classifications of integration implementation efforts have been described. First, the organizational structure summary paragraphs included reviewing the literature associated with reporting, systems, and grouping. Second, the strategic policies and tactical/operational activities summary paragraphs included reviewing the literature associated with the role of management, cross-training programs, establishing teams, and information sharing. Thus, this literature review subsection illustrates how this integration concept perspective has provided valuable managerial and academic insight regarding the enablers and barriers associated with internal and external integration implementation (e.g., Murphy and Poist 1992; Morash and Clinton 1998; Mollenkopf et al. 2000; Pagell 2004; Bagchi et al. 2005; Das et al. 2006; Zhao et al. 2008; Richey et al. 2009). Given this comprehensive discussion of the integration implementation perspective, the following integration literature review subsection focuses on the achieved state of integration perspective.

### *Achieved State of Integration*

This integration literature review subsection summarizes the current understanding and perspective of the integration concept as an achieved organizational state of being (Turkulainen and Ketokivi 2012). The O'Leary-Kelly and Flores (2002) definition provides a framework for discussing what is an achieved organizational state of integration. Specifically, with an achieved

organizational state perspective, integration refers to “the extent to which separate parties work together in a cooperative manner to arrive at mutually acceptable outcomes... [and pertains] to the degree of cooperation, coordination, interaction, and collaboration” (O’Leary-Kelly and Flores 2002, p. 226). This definition is also consistent with how the achieved organizational state of integration has been measured in empirical research (i.e., Turkulainen and Ketokivi 2012). Thus, the remainder of this subsection is dedicated to defining these four organizational states of being (i.e., cooperation, coordination, interaction, and collaboration) as well as identifying implications that are associated with internal and external integrative mechanisms.

The first achieved organizational state of integration that will be discussed is cooperation. Cooperation “reflects expectations the two exchanging parties have about working together to achieve mutual and individual goals jointly... cooperative norms do not imply one party’s acquiescence to another’s needs but rather that both parties behave in a manner that suggests they understand that they must work together to be successful” (Cannon and Perreault 1999, p. 443). Cooperation is required due to the interdependent structure and competitive nature of internal and external integrative relations (Pinto et al. 1993; Somech, Desivilya and Lidogoster 2009). Thus, the goal of integrative efforts in view of cooperation is to establish common interests among distinct parties (i.e., interdepartmental or inter-organizational) (Hill et al. 1992; Power 2005). In order to establish common interests, integrative organizational structures and strategic policies and tactical/operational activities are implemented. For example, successful reward systems establish cooperative behaviors rather than competitive behaviors by incentivizing shared benefits/risks (Kerr and Slocum 1987; Murphy and Poist 1992). Proximity via grouping is another organizational structure that encourages cooperation through interpersonal interactions (Pinto et al. 1993). Managers also have a role to establish mutual understanding and



common goals (Murphy and Poist 1992; Pinto et al. 1993). Finally, cross training, teambuilding, and socialization facilitate cooperation by creating mutual understanding, reducing conflicts, and developing interpersonal relationships (Gupta and Wilemon 1988a; Fawcett and Magnan 2002; Pagell and LePine 2002; Petersen et al. 2008; Wong et al. 2012).

The second achieved organizational state of integration to be discussed is coordination. In view of a supply chain management context, coordination is commonly defined as, “the act of managing dependencies between entities and the joint effort of entities working together towards mutually defined goals” (Malone and Crowston 1994; Arshinder and Deshmukh 2008, p. 318). Simply stated, coordination requires managing interactions among individuals that are involved with flows of information, decisions, products/services, and finances in order to achieve higher order goals (Lee 2000; Sahin and Robinson 2002; 2005). Thus, coordination mechanisms are sets of methods that are executed in order to manage interdependence among distinct parties (Xu and Beamon 2006). Given that a common barrier to coordination is a lack of transparency (i.e., information sharing, decision-making, and planning) (Stank et al. 1999a; Fawcett and Magnan 2002; Bagchi et al. 2005), integrative organizational structures, policies/activities often aim to improve transparency. For example, centralized reporting and authority assists coordination by providing transparency and direction for decision-making and planning (Hill et al. 1992; Stank et al. 1994; Kim 2006; Li and Wang 2007). Information systems are a way to facilitate coordination through information transparency (Sanders and Premus 2005; Bharadwaj, Bharadwaj and Bendoly 2007). Information-sharing considerations and cross-functional teams also improve coordination (Song et al. 1996; Cousins and Menguc 2006; Patnayakuni et al. 2006; Zhou and Benton 2007). Lastly, managers have a role in aligning coordination mechanisms and encouraging a transparent culture where coordination is possible (Daugherty et al. 1996; Danese, Romano and Vinelli 2004).

The third achieved organizational state of integration to be discussed is interactions. In the integration literature, interactions refer to information exchange processes that take place over various communication channels (Kahn and Mentzer 1996; Kahn and McDonough 1997). While interactions generally encompass consultation and information exchange activities (Kahn and Mentzer 1998; Ellinger et al. 2000), the social aspect of interactions is particularly important (e.g., Carter, Bitting and Ghorbani 2002; Cousins and Menguc 2006; Pardo et al. 2006; Petersen et al. 2008; Hirunyawipada et al. 2010) that implies a behavioral willingness and connectedness (Mollenkopf et al. 2000; Menon et al. 1997). Therefore, internal interactions generally occur for alignment purposes (e.g., product development and atypical situations), to address operational concerns and conditions, and reduce interdepartmental misunderstandings and conflicts (Kahn and Mentzer 1996; Stank et al. 1999a; Pagell 2004). Supplier interactions typically involve and arise from material management flows and product development (Salvador et al. 2001; Ragatz et al. 2002). Customer interactions generally emerge as a means to co-create processes and to gain understanding of customer expectations (Salvador et al. 2001; Piller et al. 2004). Accordingly, organizational structures and strategic policies and tactical/operational activities are implemented to facilitate collaborative interactions. The integrative organizational structures entail modifying facility layouts (i.e., grouping). Integrative strategic policies entail cross-functional teams (Pagell and LePine 2002; Cousins and Menguc 2006) and tactical/operational activities include meetings and conference calls (Kahn and Mentzer 1996; 1998; Stank et al. 1999; Ellinger et al. 2000).

The fourth achieved organizational state of integration to be discussed is collaboration. The process of collaborating within a supply chain context is described as a complex and socially derived phenomenon (Jap 1999). The act of collaboration requires a willingness to work together (Kahn and Mentzer 1996; Kahn and McDonough 1997; Spekman, Kamauff and Myhr 1998;

Ellinger et al. 2000; Stank et al. 2001b; Fawcett et al. 2007). Thus, collaboration refers to “an affective, volitional, mutual/shared process where two or more departments [or organizations] work together, have mutual understanding, have a common vision, share resources, and achieve collective goals” (Kahn 1996, p. 139). Considering that collaboration represents the unstructured relational component of integration, the biggest difficulty with collaboration is that behaviors are voluntary and do not lend themselves to be formalized, programmed, or mandated (Kahn 1996; Ellinger et al. 2000). Nonetheless, collaborative behaviors may be encouraged via implementing integrative structures and strategic policies that build long-term trusting relationships by focusing on higher order goals and joint-problem solving, clarifying collective objectives and expectations, establishing a mutual accountability for the outcomes, and encouraging informal and educational communication (Ellinger et al. 2006). The integrative organizational structures that are associated with collaboration are measurement and reward systems as well as grouping (Song et al. 1996; Ellinger et al. 2000; Pagell 2004). The integrative strategic policies involve managerial support, developing cross-functional teams, and information sharing (i.e., credibility and amount shared) (Stank et al. 1999b; Mentzer et al. 2000; Cao and Zhang 2011; Wong et al. 2012).

In summary, this integration subsection has focused on the literature associated with the current understanding of the integration concept as an achieved organizational state. Specifically, four behaviors are observed when integration is achieved. First, cooperation is observed behavior that represents shared understanding and collective effort toward a common goal (Cannon and Perreault 1999). Second, coordination (i.e., processes and decisions) represents a collective effort to manage and establish efficient interdependent processes when pursuing higher order objectives (i.e., Malone and Crowston 1994; Lee 2000; Sahin and Robinson 2002; 2005). Third, although interactions are depicted as information sharing activities, the act of interacting encompasses

social and behavioral aspects involving connectedness and avoiding conflict (Ellinger et al. 2000; Menon et al. 1997; Kahn and Mentzer 1998; Mollenkopf et al. 2000). Fourth, collaboration is a complex and socially derived phenomenon that is exhibited by individuals that are willing to work together rather than are forced to work together (Kahn 1996; Kahn and Mentzer 1996; Kahn and McDonough 1997; Spekman et al. 1998; Jap 1999; Ellinger et al. 2000; Stank et al. 2001; Fawcett et al. 2007). Accordingly, this subsection demonstrates how an achieved organizational state of integration perspective lends itself well to empirically examine the outcomes of achieving internal integration as well as achieving supplier integration (Turkulainen and Ketokivi 2012).

As illustrated by the comprehensive integration concept literature review, the majority of researchers have examined integration as implementation mechanisms (Power 2005). However, integrative implementation efforts do not necessarily result in an achieved organizational state of integration (e.g., Handfield and Nichols 2002; Kampstra et al. 2006; Zachariassen and vanLiempd 2010). Thus, to accurately study the outcomes of achieving internal integration and the effects on achieving supplier integration, this dissertation adopts an organizational state of integration (i.e., Turkulainen and Ketokivi 2012). A key theoretical implication of this perspective is based on the notion that integration implementation mechanisms are required to achieve an organizational state of integration (Power 2005). Thus, integrative mechanisms are inferred and are essentially captured via an achieved organizational state of integration (Turkulainen and Ketokivi 2012).

### Supply Chain Orientation Literature

The orientation concept has been applied across several business contexts (e.g., customer, competitor, functional, market, and supply chain) to describe the state of an organization as well as to explain how organizational culture is managed to achieve strategic goals (Saxe and Weitz

1982; Kohli and Jaworski 1990; Pearson 1993; Armstrong and Collopy 1996; Poli and Scheraga 2000; Mentzer et al. 2001). Accordingly, given a supply chain context, Mentzer et al. (2001) first defined supply chain orientation (SCO) as “the recognition by an organization of the systemic, strategic implications of the tactical activities involved in managing the various flows in a supply chain” (p. 11). However, more recent developments of SCO acknowledge that, “a supply chain-oriented firm not only places strategic emphasis on systemic, integrated SCM, but also aligns this strategic thrust with an organizational structure that capitalizes on this strategy” (Esper, Defee and Mentzer 2010, p. 164). Considering the implications of both SCO dimensions (i.e., strategic and structure), the following two subsections summarize the strategic and structural perspectives of SCO, respectively. Finally, this SCO literature review section concludes with summarizing the adopted strategy-structure SCO perspective, which offers a more accurate account of SCO within a supply chain management environment (Esper et al. 2010; Jüttner and Christopher 2013).

### *Strategic SCO Perspective*

The strategic SCO perspective is attributed to the original conceptualization, where rather than focusing on either internal, supplier, or customer integrative behaviors and implementation, SCO is an organizational-wide strategic awareness and acceptance of supply chain management that symbolizes focusing on supply chain integrative behaviors and implementation (i.e., internal, supplier, and customer) (Mentzer et al. 2001; Esper et al. 2010). Given this perspective, the role of SCO is focused efforts on cultural elements within an organization that influence supply chain relationships (Mentzer et al. 2001; Min and Mentzer 2004). The six elements SCO organizations focus their efforts on are credibility, benevolence, commitment, top management support, norms, and compatibility (Min and Mentzer 2004; Min et al. 2007). While credibility, benevolence, and

commitment are grounded by trust literature (Morgan and Hunt 1994; Doney and Cannon 1997), top management support, norms, and compatibility relate to facilitating mutuality and alignment. Thus, the following paragraphs are dedicated to defining and describing all six strategic elements.

Credibility represents “a firm’s belief that its partner stands by its word, fulfills promised role obligations, and is sincere” (Min and Mentzer 2004, p. 65). Researchers have identified credibility as one of the two dimensions of trust that captures an organization’s perception of an exchange partner’s reliability and competence (Doney and Cannon 1997). Specifically, reliability is described as the probability a supply chain member’s responsibilities and requirements will be fulfilled (Thomas 2002) while organizational competence is dependent on the appropriateness of labor qualifications, accumulated experience, and organizational resources (Jacob 2006). Once established, perceptions of credibility are essentially ingrained in the organizational identity (i.e., reputation), which influences decisions regarding relationship continuance (Sahay 2003).

Benevolence refers to “a firm’s belief that its partner is interested in the firm’s welfare, is willing to accept short-term dislocations, and will not take unexpected actions that would have a negative impact on the firm” (Min and Mentzer 2004, p. 65). Accordingly, the general consensus is benevolence is the second dimension of trust that captures the degree to which an organization is genuinely interested in an exchange partner’s circumstances and is motivated to pursue shared rewards (Kumar, Scheer and Steenkamp 1995; Doney and Cannon 1997). Considering the nature of benevolence, hindrance of exchange partner’s goals is referred to as conflict (Heikkilä 2002).

Commitment is defined as “an implicit or explicit pledge of relational continuity between exchange partners” (Dwyer, Schurr and Oh 1987, p. 19). As this definition suggests, the supply chain members may be explicit in acknowledging that commitment is a defining feature of their relationship (e.g., long-term contracts and equal distribution of power). Nevertheless, a number

of researchers have also reported that commitment naturally arises from developing trust among supply chain exchange partners (Speckman 1988; Morgan and Hunt 1994; Kwon and Suh 2004). Given either approach, implicit or explicit signals, commitment shapes the rules of engagement and interactive behaviors between the exchange partners (Spekman and Carraway 2006).

Top management support requires strong leadership and involves clearly communicating an overall strategic direction as well as overtly expressing a commitment to change (Murphy and Poist 1992; Mollenkopf, Gibson and Ozanne 2000; Min and Mentzer 2004). Accordingly, top management support is recognized by a number of researchers as a critical factor in changing an organization's orientation, direction, and values (Mentzer et al. 2001). In this context, the role of top managers is to facilitate effective and efficient inter-organizational behaviors by establishing an organizational culture that recognizes the benefits of behaving in a manner that is consistent with a supply chain management philosophy (Mentzer et al. 2001; Min and Mentzer 2004).

Norms (i.e., cooperative norms) are described as a "perception of the joint efforts of both the supplier and distributor to achieve mutual and individual goals successfully while refraining from opportunistic actions" (Siguaw et al. 1998, p. 102). A key condition is that neither exchange partner yields to the other exchange partner's goals or needs, instead both parties understand that success is best achieved via joint responsibility and flexibility (Cannon and Perreault 1999). This concept relates to norms of exchange (i.e., reciprocity), where exchange partner's actions initiate a response in kind by other exchange partners (Gouldner 1960; Cropanzano and Mitchell 2005).

Compatibility encompasses alignment between corporate cultures as well as management techniques (Min and Mentzer 2004), in which 'compatibility' does not necessarily infer perfectly similar, but rather, not conflicting (Scholz 1987). First, corporate culture compatibility has been deemed necessary given that for supply chain members to operate as a single channel, individual

attitudes and behaviors must be congruent between exchange partner firms (Lambert and Cooper 2000). Second, management techniques relate to middle manager's philosophies and approaches for implementing objectives, in which similar operating styles and values facilitate partnership development (Lambert, Emmelhainz and Gardner 1996). The degree to which exchange partners are compatible influence perceived effectiveness of the partnership (Bucklin and Sengupta 1993).

### *Structural SCO Perspective*

In addition to the strategic SCO perspective, researchers have developed a structural SCO perspective (e.g., Esper et al. 2010). This SCO perspective focuses on structural elements for the "implementation of SCM philosophy in individual firms in a supply chain" (Min and Mentzer 2004, p. 67), where SCM philosophy is "systems approach to viewing the supply chain as a single entity, rather than as a set of fragmented parts, each performing its own function" (Mentzer et al. 2001, p. 7). Thus, a structural SCO perspective focuses on elements that enable a strategic SCO perspective (SCM strategic awareness/acceptance) (Mentzer et al. 2001; Esper et al. 2010). The following paragraphs define and briefly describe all four of the structural elements, respectively.

Organizational design refers to the complex process of evaluating and executing policies that relate to coordination, division of responsibilities and labor, decision-making authority, and communication systems (Trent 2004). The SCO organizational designs are internal integration, structure (i.e., formalization, intensity, frequency, standardization, and reciprocity), and internal collaboration (Esper et al. 2010). Although these concepts have been discussed at length, what differentiates a SCO approach from prior descriptions of these concepts is a continuous versus a discrete perspective. Simply stated, a SCO approach considers the future implications of internal integration, structure, and internal collaboration (e.g., Esper et al. 2010; Kotzab et al. 2011).



Information technologies have been deemed as necessary resources to improve effective decision-making through the acquisition, processing, and transmission of valuable information (Closs et al. 1997; Sanders and Premus 2005). Given a SCO approach, the role of information technologies is a boundary-spanning structural link and communication medium that enhances visibility (Esper et al. 2010). Importantly, although information technology is a facilitating tool for collaboration, it is human interaction that creates collaboration through the use of information technologies (Mentzer, Foggin and Golicic 2000; Sanders and Premus 2005; Rollins et al. 2011).

Human resources require managing intra- and inter-organizational behavior (Rinehart and Ragatz 1996). Given a SCO perspective, human resources are classified as supply chain-related knowledge, skills, and abilities (KSA) or as the human resource strategies that are responsible for contributing and developing the KSAs (Esper et al. 2010). First, the foundational KSA literature acknowledges necessary managerial attributes such as business, logistics, and management skills (Poist 1984; Murphy and Poist 1998) (Esper et al. 2010). Second, the human resource strategies include the coaching concept (Orth et al. 1987; Ellinger et al. 2005), internally marketing ideas (George 1990; Keller et al. 2006), person-organization fit (Kristof 1996; Autry and Daugherty 2003), and self-managing teams (Deeter-Schmelz 1997; Somech et al. 2009) (Esper et al. 2010).

Organizational measurements ought to focus on optimizing the entire system, rather than on individual variables or functions (Brewer and Rosenzweig 1961; Novack, Rinehart and Wells 1992). The SCO approach particularly focuses on boundary-spanning measures (i.e., Brewer and Speh 2000; Holmberg 2000; Lambert and Pohlen 2001) that take into account the implications of four evaluation dimensions (i.e., competitive basis, measurement focus, organizational type, and measurement frequency) (Griffis et al. 2004; Esper et al. 2010). Moreover, these measurements should be developed in view of a supply chain SSP framework (Chow et al. 1995; Fisher 1997).

### *Strategy-Structure SCO Perspective*

In summary, researchers have acknowledged that SCO is a vital antecedent and facilitator of supply chain management (e.g., Mentzer et al. 2001; Min and Mentzer 2004; Esper et al. 2010; Jüttner and Christopher 2013). Since the introduction of the SCO concept (Mentzer et al. 2001), researchers have identified strategic and structural elements that are necessary conditions of SCO (Esper et al. 2010; Kotzab et al. 2011). Accordingly, these six strategic elements are credibility, benevolence, commitment, top management support, norms, and compatibility (Min and Mentzer 2004) while the four structural elements include organizational design, information technology, human resources, and organizational measurement (Esper et al. 2010). More recent contributions to understanding SCO have focused on developing a strategy-structure perspective (e.g., Esper et al. 2010; Jüttner and Christopher 2013). In general, this strategy-structure SCO perspective captures the efforts for an organizational-wide strategic awareness and acceptance as well as the implementation structures of a supply chain management philosophy (Mentzer et al. 2001; Min and Mentzer 2004; Esper et al. 2010).

Considering that a strategy-structure SCO perspective is more accurate when examining a supply chain management context (e.g., Esper et al. 2010; Jüttner and Christopher 2013), this dissertation research is one of the first to adopt Kotzab et al.'s (2011) strategy-structure SCO perspective. In particular, Kotzab et al. (2011) delineated the internal and external supply chain management conditions, in which external conditions capture and reflect a strategy-structure SCO perspective. Although specific justifications will be described in detail in chapter three, this external conditions construct (i.e., joint SCM conditions) is appropriate for this research since it reflects a SCO and is an achieved organizational state that results from executing organizational (i.e., internal) supply chain management strategies and structures (Kotzab et al. 2011).

## Theoretical Literature

Self-categorization theory (SCT) (Turner 1985; Turner et al. 1987) is the framework that explores the cognitive identification process in which an individual classifies oneself and others as either in-group members or out-group members of social groups (Pratt 2001). Accordingly, social identity theory (SIT) (Tajfel 1974; Tajfel and Turner 1979) is the framework that explores the behavioral outcomes of an identification state in which an individual's self concept is partly derived from one's psychological membership of social groups (Hughes 2007). Considering the interrelatedness of these theoretical frameworks, researchers have extended SIT by incorporating the SCT theoretical underpinnings (i.e., cognitive identification process) as a means to completely examine organizational identification (i.e., process and state) via solely a SIT lens (Pratt 2001).

Organizational identification (Simon 1947; March and Simon 1958) is grounded in social psychology and is applied in research to examine and explain organizational behavior (Ashforth and Mael 1989). The organizational identification concept originated from identification (Freud 1922) and group identification (Tolman 1943). Specifically, identification may refer to a process in which an individual assimilates with other individuals or inanimate objects or may represent a state of psychological attachment towards the identified foci (Burke 1937; Simon 1947; Cheney and Tompkins 1987; Corsten, Kucza and Peyinghaus 2006). Group identification (Tolman 1943) introduces social and behavioral dimensions to identification (Corsten et al. 2006). Accordingly, organizational identification is an extended perspective of group identification that occurs within an organization (Ashforth and Mael 1989). Organizational identification refers to "the perception of oneness with or belongingness to an organization where the individual defines him or herself at least partly in terms of their organizational membership" (Mael and Ashforth 1992, p. 109).

Given the theoretical frameworks and origin associated with organizational identification, this literature review subsection is organized as follows. First, the organizational identification process will be addressed via identifying and describing the conditions and factors that facilitate (i.e., antecedents) organizational identification. Second, the behavioral implications associated with the state of organizational identification will be discussed with regards to the in-group (i.e., intra-organizational) behaviors as well as with regards to the out-group (i.e., inter-organizational) behaviors. This theoretical section concludes the literature review portion of this second chapter; whereby, the final section of this chapter is dedicated to developing the hypotheses.

### *Organizational Identification Process*

In general, there are three broad conditions and a number of factors that contribute to organizational identification (i.e., increases tendency of group identification) (Ashforth and Mael 1989). The first condition is prestige (March and Simon 1958; Chatman, Bell and Staw 1986). Specifically, organizational prestige is depicted by “the perception a member of the organization has that other people, whose opinions are valued, believe that the organization is well-regarded (e.g., respected, admired, prestigious, well-known)” (Bergami and Bagozzi 2000, pp. 561-562). This condition illustrates the notion that one’s self concept is often derived from organizational identification in which individuals are motivated to maintain a favorable social identity and do so by aligning themselves with their prestigious organization (Tajfel and Turner 1986; Dutton et al. 1994; Hughes 2007). Simply stated, prestige increases organizational identification tendency via contributing to self-enhancement and improving the individual’s self-esteem by allowing one to ‘bask in reflected glory’ of the successful identified source (Cialdini et al. 1976, p. 366; Bergami and Bagozzi 2000). Examples of common attributes that are perceived to signal organizational

prestige and motivate one to assimilate with an organization are corporate image (e.g., powerful and innovative), philanthropic efforts (e.g., humanitarian actions and advocacy), and reputation of the organization among the general public and within the industry (e.g., competent and efficacy) (Dutton and Dukerich 1991; Dutton et al. 1994; Scott and Lane 2000; Kim et al. 2010).

The second condition is distinctiveness (Tolman 1943; Oakes and Turner 1986), whereby the organizational attributes are inimitable and unique when considering and comparing to inter-organizational distinct attributes (Kim et al. 2010). Specifically, these organizational attributes generally relate to the organization's values and practices (e.g., culture, strategy, and structure) (Ashforth and Mael 1989; Dutton et al. 1994). This second condition also illustrates the premise that one's self concept is partly derived from organizational identification given that individuals are motivated to accentuate their own uniqueness (i.e., distinct values and traits) and maintain a consistent self concept by assimilating with organizations that exhibit shared characteristics and values (Ashforth and Mael 1989; Dutton et al. 1994; Kunda 1999; Ahearne, Bhattacharya and Gruen 2005). A number of organizational features and practices that contribute to distinctiveness include physical symbols and images that reflect organizational values and reinforce affiliation (e.g., organizational apparel, motivational facility signage, and office space artifacts), promoting a team atmosphere and a shared sense of community (e.g., explicit managing and self-monitoring of shared feelings), and implementing distinct organizational values and practices (e.g., culture, strategies, structures, linguistics, and social events) (Clark 1972; Ashforth and Mael 1989; Dutton et al. 1994; Pratt and Rafaeli 1997; Alvesson and Willmott 2002; Cardador and Pratt 2006).

The third condition, salience of the out-groups (Turner 1981; Allen, Wilder and Atkinson 1983), is defined as "activation of an identity in a situation" (Oakes 1987; Stets and Burke 2000, p. 229). This condition demonstrates that an "awareness of out-groups reinforces awareness of

one's in-group” (Ashforth and Mael 1989, p. 25). This condition relates to the natural tendency to create social boundaries by dividing and categorizing groups into “us” versus “them” (Turner 1985; Ashforth and Mael 1989; Alvesson and Willmott 2002). Accordingly, by nature this inter-group comparison facilitates organizational identification by reinforcing the group categorization (i.e., when perceived in-group differences are less than perceived out-group differences) (Turner et al. 1987; Stets and Burke 2000). An important component of this third condition is the degree of either perceived or actual inter-group competition (Mael and Ashforth 1992). For example, researchers have found that assigning individuals into random groups strengthens identification by suggesting a competitive state (Billig and Tajfel 1973; Locksley et al. 1980; Ashforth and Mael 1989). Therefore, such inter-group competition strengthens organizational identification by intensifying out-group discrimination and in-group cohesion (i.e., in-group and out-group boundaries are more sharply drawn) (i.e., Ashforth and Mael 1989; Mael and Ashforth 1992). Conditions that accentuate this salience of out-groups are conflict of interests (e.g., conflicting goals/objectives/rewards and resource competition), psychological and physical barriers (e.g., lack of interdependence and proximity), and poor leadership (e.g., failing to coach employees on the importance of cooperation and communication and not providing necessary dispute resolution mechanisms) (Bullis and Tompkins 1989; Ashforth and Johnson 2001; Cardador and Pratt 2006).

In addition to the three broad conditions that facilitate organizational identification, there are several traditional group formation factors (e.g., interpersonal interactions, close proximity, sharing goals and/or threats, task interdependence, common history, similarities, and liking) that increase the tendency of organizational identification (Ashforth and Mael 1989; Scott and Lane 2000). Although the majority of these traditional group formation factors have been identified as organizational features and practices that contribute to distinctiveness (e.g., common history and

similarities) or as conditions that accentuate salience of out-groups (e.g., close proximity, sharing goals and/or threats, and task interdependence) (Dutton et al. 1994; Ashforth and Johnson 2001; Cardador and Pratt 2006), it is important to acknowledge the relational component of how these factors encourage organizational identification. Specifically, interpersonal relationships increase the tendency and strength of organizational identification (Ashforth and Mael 1989; Dutton et al. 1994). The commonly recognized facilitators of interpersonal relationships that positively affect organizational identification include interpersonal interactions, close proximity, common history and shared cultural norms, interdependent teams, and manager efforts (Ashforth and Mael 1989; Dutton et al. 1994; Rousseau 1998; Ashforth and Johnson 2001; Houston et al. 2001; Cardador and Pratt 2006; Ritzer et al. 2006; Somech et al. 2009; Webber 2011).

In sum, the cognitive organizational identification process is a social-driven phenomenon that involves categorization (i.e., identifying and establishing in-group and out-group boundaries) as well as self-enhancement (i.e., antecedents that increase organizational identification tendency) (Pratt 2001). Specifically, categorization serves as a means for an individual to define their place within society and reinforcing and contributing to one's self-concept by answering, "Who am I?" (Tajfel 1981; Stryker and Serpe 1982; Turner 1982; Turner 1985; Turner et al. 1987; Ashforth and Mael 1989). There are three conditions and several behavioral-related factors that facilitate organizational identification (i.e., prestige, distinctiveness, salience of out-groups, interpersonal interactions, close proximity, sharing goals and/or threats, task interdependence, common history, similarities, and liking) (Tolman 1943; March and Simon 1958; Turner 1981; Allen et al. 1983; Chatman et al. 1986; Oakes and Turner 1986; Ashforth and Mael 1989). Given this discussion of the cognitive organizational identification process, the following section delineates intra- and inter-organizational behavioral outcomes of organizational identification.

### *Organizational Identification Behaviors*

Organizational identification depicts a psychological attachment to an organization where individuals attribute organizational successes and failures as personal experiences and develop “feelings of oneness with the organization” (Tolman 1943; Foote 1951; Ashforth and Mael 1989; Mael and Tetrick 1992; Corsten et al. 2006, p. 172). Thus, organizational identification initiates support (i.e., loyalty) toward the organization in addition to feelings of solidarity and unity, which reinforce organizational identification (Foote 1951; Patchen 1970; Ashforth and Mael 1989). An important premise of SIT is that organizational identification also prompts behaviors traditionally associated with group formation (Turner 1982; 1984; 1985; Ashforth and Mael 1989).

Organizational identification (i.e., via group formation) contributes to the development of an in-group bias that arises from a perceived shared categorical identity among in-group members (Tajfel and Turner 1986; Dutton et al. 1994; Turner 1999). Given this perception of similarities (i.e., perceived shared categorical identity), the resulting favoritism among the in-group members (i.e., intra-organizational employees) is responsible for improving intra-group attitudes, cohesion, cooperation, altruism, trust, reciprocity, collective behavior, shared norms, mutual influence, and favorable perceptions/evaluations of the in-group (Turner 1978; 1982; 1984; Hogg and Abrams 1988; Ashforth and Mael 1989; Kramer 1991; Dutton et al. 1994; Hogg and Terry 2001). Also, as organizational identification heightens, individuals become increasingly motivated to achieve the organizational goals, are more proficient at coordinating actions and decisions with in-group members, are inclined to provide in-group support and assistance, and are willing to interact and share information with in-group members (Dutton et al. 1994; Scott and Lane 2000; Ashforth et al. 2008). The reasoning for such substantial effort on the part of an organization is based on the notion that one’s self-concept is derived from organizational identification (Berger, Cunningham



and Drumwright 2006). Specifically, collective interest becomes self-interest and individuals are motivated by the organizational collective interest (van Knippenberg and Sleebos 2006).

Although organizational identification (i.e., via group formation) is responsible for several favorable intra-organizational behaviors as well as motivates individuals to dedicate efforts that are consistent with organizational goals (Dutton et al. 1994; van Knippenberg and Sleebos 2006), SIT explains that organizational identification may be responsible for several unfavorable inter-organizational behaviors (Tajfel et al. 1971; Richter et al. 2006). Specifically, the most common inter-group behaviors are critical inter-group perceptions, outbreaks of conflict and dissonance, undervalued evaluations, competition and rivalry, hostile attitudes, distrust, and stereotyping (Turner 1975; Pelled and Adler 1994; Brewer 1996; Richter et al. 2006). One of the reasons for these inter-group conflicts is due to defending in-group prestige, distinctiveness, and salience of the out-groups (i.e., preserving group categorization) (Turner 1985; Abrams and Hogg 1988). A second reason for the greater tendency of inter-group conflict is based on the theoretical premise that organizational identification contributes to developing out-group (i.e., inter-organizational) discrimination and innate perceptions of inter-organizational conflict of interest (Turner 1975; Locksley et al. 1980). Specifically, this competitive component of organizational identification originates from the inherent norm of competitive group behavior in which strong identification prompts individuals to behave in a manner that ensures maximizing the in-group rewards over that of the out-group (Tajfel et al. 1971; Hornsey 2008). Importantly, rewards can be tangible and monetary or can represent a valuable emotional significance (Turner 1975; Tajfel 1978).

In summary, organizational identification (via group formation) contributes to improving in-group attitudes, cohesion, cooperation, altruism, trust, reciprocity, collective behavior, shared norms, mutual influence, and favorable perceptions/evaluations of the in-group (Ashforth and

Mael 1989; Dutton et al. 1994; Scott and Lane 2000; Cardador and Pratt 2006). Nevertheless, organizational identification (via group formation) contributes to critical out-group perceptions, outbreaks of conflict and dissonance, undervalued evaluations, competition and rivalry, hostile attitudes, distrust, and stereotyping (Turner 1975; Pelled and Adler 1994; Brewer 1996; Richter et al. 2006). Importantly, group membership is more than a manual for acceptable organizational behavior; rather, organizational identification becomes a component of individuals' psychology that shape perceptions and interactions (Ashforth and Mael 1989; Turner and Haslam 2001).

### Hypothesis Development

This research examines organizational identification within a supply chain management context. This dissertation research incorporates the internal-to-external implementation approach to supply chain integration, the common mechanisms required to achieve internal and supplier integration, the barriers associated with integration implementation efforts, and the antecedents and behaviors (i.e., in-group and out-group) that are associated with organizational identification. The four constructs of interest are achieved internal integration, achieved supplier integration, organizational identification, and supply chain orientation. Table 1 provides the definitions for each of these four key constructs. The below paragraphs develop the three hypotheses.

Table 1. Construct Definitions

<b><i>Achieved Internal Integration</i></b> (O'Leary-Kelly and Flores 2002; Turkulainen and Ketokivi 2012)	An organizational state of cooperation, coordination, interaction, and collaboration.
<b><i>Achieved Supplier Integration</i></b> (O'Leary-Kelly and Flores 2002; Turkulainen and Ketokivi 2012)	An organizational state of cooperation, coordination, interaction, and collaboration that involves a supplier.
<b><i>Organizational Identification</i></b> (Mael and Ashforth 1992, p. 109)	An organizational state of "psychological attachment" towards the organization.
<b><i>Supply Chain Orientation</i></b> (Mentzer et al. 2001; Esper et al. 2010)	An organizational strategic acceptance and structural implementation of a supply chain management philosophy.

The first hypothesis involves explaining the relationship between internal integration and organizational identification. Specifically, the generally accepted internal integrative structures and policies/activities are informal governance structures, information systems, properly aligned measurement and reward systems, grouping (i.e., proximity), manager support and commitment, cross-training, interdepartmental teams, and frequent informal information sharing (Murphy and Poist 1992; Pinto et al. 1993; Gustin et al. 1995; Mollenkopf et al. 2000; Pagell 2004; Garrett et al. 2006; Germain et al. 2008; Hirunyawipada et al. 2010). Likewise, the commonly recognized factors that contribute to organizational identification are interpersonal interactions, proximity, sharing goals and/or threats, interdependent teams, management cultural efforts (i.e., behavioral), task interdependence, common history and cultural norms, similarities, and liking (Ashforth and Mael 1989; Dutton et al. 1994; Scott and Lane 2000; Cardador and Pratt 2006).

There are also similarities between the in-group behaviors associated with organizational identification (i.e., improving attitudes, cooperation, favorable perceptions/evaluations, cohesion, reciprocity, collective behavior, norms, trust, altruism, and mutual influence) and the achieved internal integration behaviors (i.e., cooperation, coordination, interaction, and collaboration) that reinforce and strengthen organizational identification (Ashforth and Mael 1989; Dutton et al. 1994; Hogg and Terry 2001; O'Leary-Kelly and Flores 2002; Turkulainen and Ketokivi 2012). Therefore, the first hypothesis is grounded by SIT and incorporates internal integration research:

H1: Achieved internal integration has a positive effect on organizational identification.

Despite the favorable and advantageous intra-organizational behavioral outcomes that are associated with organizational identification and the reinforcing behaviors attributed to achieving internal integration, SIT suggests organizational identification is a source of behavioral barriers

when organizations extend internal integration to external integration. Specifically, the common inter-group (i.e., inter-organizational) behaviors are critical inter-group perceptions, outbreaks of conflict and dissonance, undervalued evaluations, competition and rivalry, stereotyping, hostile attitudes, and distrust (Turner 1975; Pelled and Adler 1994; Brewer 1996; Richter et al. 2006). One reason for the greater tendency of inter-group conflict originates from the inherent norm of competitive group behavior in which identification prompts individuals to behave in a manner to maximize in-group rewards over that of the out-group (Tajfel et al. 1971; Locksley et al. 1980).

Organizational merger research also reveals that inter-group behaviors that are associated with strong organizational identification hinder inter-organizational integrative efforts due to organizational identity threats (vanLeeuwen, vanKnippenberg and Ellemers 2003). These threats take form of lowering organizational prestige (e.g., association with less reputable organization), reducing organizational distinctiveness (e.g., changes to unique culture, structures, or strategies), and/or behaviors that are consistent with defending salience of out-groups (i.e., preserving group categorization) (Skevington 1980; vanLeeuwen et al. 2003). In the supplier integration context, it is expected organizational identification will prompt negative out-group behaviors toward the supplier. Specifically, common supplier integration mechanisms (e.g., systems, manager support, cross-training, and boundary spanners) pose threats to organizational distinctiveness and highlight salience of the out-group (i.e., supplier) (Ragatz et al. 1997; Wagner 2003; Piercy 2008). Hence:

H2: Organizational identification has a negative effect on achieving supplier integration.

Given that the first two hypotheses relate to examining a source of relational behavioral barriers of supply chain integration that originates within an organization, the third hypothesis is dedicated to examining a solution that mitigates the source of the relational behavioral barriers of

supply chain integration. This dissertation introduces SCO as a means to mitigate the negative effect organizational identification has on achieving supplier integration. Similar to the preceding hypotheses, this final hypothesis is derived from both the contextual and theoretical literature.

Researchers have acknowledged SCO as a vital antecedent and facilitator of supply chain management (Jüttner and Christopher 2013). Specifically, the role of SCO is a focused effort on elements within a focal organization that have an influence on supply chain relationships, where SCO within all organizations that comprise a supply chain represents supply chain management (Mentzer et al. 2001; Min and Mentzer 2004; Esper et al. 2010; Kotzab et al. 2011). The outcome of the structural and strategic SCO efforts is an overarching supply chain perspective, in which rather than focusing on either intra-organizational or inter-organizational objectives and rewards, an organization focuses on the entire supply chain's objectives and rewards (Mentzer et al. 2001; Min and Mentzer 2004; Esper et al. 2010). A critical distinction between the SCO structural and strategic efforts and the integrative mechanisms is that SCO incorporates a holistic approach to supply chain management while internal and external integrative mechanisms typically suggest a piecemeal approach to implementing supply chain management. Given the contextual literature, SCO is a viable solution since it occurs within the boundaries of a focal organization, is necessary condition when implementing supply chain management (i.e., extending internal integration to external integration), and yields favorable inter-organizational behavior (Mentzer et al. 2001; Min and Mentzer 2004; Esper et al. 2010; Kotzab et al. 2011; Jüttner and Christopher 2013).

The theoretical literature provides greater insight as to the hypothesized SCO moderating effect between organizational identification and achieving supplier integration. Specifically, SIT explains that the unfavorable inter-group behaviors arise due to perceived or actual inter-group competition as well as from organizational identity threats (i.e., prestige, distinctiveness, and

salience of out-groups) (Tajfel et al. 1971; Turner 1975; 1985; Abrams and Hogg 1988; Locksley et al. 1980; Skevington 1980; vanLeeuwen et al. 2003; Hornsey 2008). In order to mitigate negative inter-group behaviors, researchers have concluded that the best solution is to establish an acceptance and the pursuit of a common, superordinate goal without threatening identities (Deschamps and Brown 1983; Brewer 1996). Accordingly, SCO moderates the negative effect organizational identification has on achieving supplier integration since SCO does not eliminate organizational identification; rather, it mitigates the unfavorable inter-group behaviors associated with inter-group competition (i.e., salience of out-group) and is nonthreatening to organizational prestige and organizational distinctiveness. Therefore, the final hypothesis is given by:

H3: Supply chain orientation mitigates the negative effect that organizational identification has on achieved supplier integration (i.e., negatively moderates).

As depicted from the proposed conceptual model (Figure 1), organizational identification introduces an interesting paradox when considering the generally accepted approach to implement supply chain integration (i.e., internal-to-external) (Stevens 1989). Specifically, firms that focus solely on the internal integration phase of supply chain integration and dedicate substantial effort to eliminating functional silos are expected to establish firm-wide organizational identification. The outcomes are favorable inter-departmental behaviors and operational efficiencies originating from enhanced coordination and cooperation (Corsten et al. 2006). In this situation, it appears that internal integration has been successfully achieved. *However*, when such an organization then attempts to extend internal integration to supplier integration, organizational identification is expected to prompt employees to perceive integrating with a supplier as a possible threat to the current organizational state (Skevington 1980; van Leeuwen et al. 2003). The result is behaviors

associated with defending organizational prestige, distinctiveness, and salience of the out-groups and competitive inter-organizational behavior (e.g., critical perceptions, conflict and dissonance, undervalued evaluations, hostile attitudes, rivalry, and distrust) (Tajfel et al. 1971; Turner 1975; Locksley et al. 1980; Skevington 1980; van Leeuwen et al. 2003; Richter et al. 2006).

Although researchers have advocated supplier-to-buyer identification (e.g., Corsten et al. 2006; Corsten et al. 2011) or supply chain identification (e.g., Min, Kim and Chen 2009), higher order identification is not a solution for this context for two reasons. First, when comparing the supplier integrative mechanisms with the common antecedents of organizational identification, there are fewer similarities and less success when implementing supplier integrative mechanisms (e.g., inter-organizational measurement and reward systems, proximity, cross-training and teams, informal governance, and unwilling to share information) (Ragatz et al. 1997; Ashforth and Mael 1989; Fawcett and Magnan 2002; Sinkovics and Roath 2004). Second, although individuals often have multiple identities, having multiple identities within a supply chain context is likely to create identity conflict and when identity inconsistency arises, an individual often resorts to their lower order identity and essentially nothing will have changed (Ashforth et al. 2008). Accordingly, for the purpose of implementing supply chain integration (i.e., internal-to-external approach), higher order identification will only strengthen the established organizational identification.

This second chapter has summarized the integration literature (i.e., internal, customer, supplier, and supply chain), the SCO literature, and organizational identification SIT literature. Three hypotheses have been developed based on the contextual and theoretical bodies of literature. Thus, the following third chapter of this dissertation is dedicated to describing the quantitative research design and procedures that will be applied in order to test the direct and the moderating effects among the four constructs of interest.

## CHAPTER 3

### METHODOLOGY

The purpose of this third chapter is to identify the methodology that best answers the three research questions and describe the research design and analytical techniques that will be applied for hypothesis testing. The chapter begins by justifying the intended quantitative methodology, research design, and the selected statistical modeling technique. Next, the population and sample characteristics are identified. The intended data collection procedures are discussed and followed by introducing the intended instrumentation. Finally, the last three sections describe the specific procedures that are associated with the preliminary data preparation (i.e., suspicious response patterns, univariate outliers, normal distribution, and multicollinearity), the measurement model (i.e., establishing reliability and validity), and the structural model (i.e., testing the hypotheses).

#### Quantitative Methodology and Survey Research Design

This dissertation research will entail a quantitative methodology in order to answer three overarching research questions:

1. Does achieving internal integration have an effect on organizational identification?
2. Does organizational identification have an effect on achieving supplier integration?
3. Does supply chain orientation moderate the effect that organizational identification has on achieving supplier integration?

Considering these three research questions involve testing and explaining theoretically grounded relationships, a quantitative methodology is appropriate (Johnson and Onwuegbuzie 2004). Also, as it relates to this dissertation, a quantitative methodology is best suited for research problems that involve identifying antecedents of an outcome as well as factors that influence an outcome



(Creswell 2009). A quantitative methodology is also most useful when precise numerical data are required in testing predictive theoretical hypotheses (Johnson and Christensen 2003), in which a survey is an appropriate data collection procedure (Handfield and McInyk 1998; Creswell 2009).

In general, a survey refers to “the selection of a relatively large sample of people from a pre-determined population, followed by the collection of a relatively small amount of data from those individuals” (Kelley et al. 2003, p. 261). A survey is essentially designed to provide insight of the state or conditions concerning a sample of a population of interest at a specific moment in time (Creswell 2009; Dillman, Smyth and Christian 2009). The advantages of a survey research design are generalizability, standard measurements, and the data are real-world observations (Yin 1994; Tamas 2000; Creswell 2009). A survey research design also lends itself well to testing hypotheses involving relationships between independent, moderating, and dependent variables (Kelley et al. 2003; Creswell 2009). Thus, since this dissertation adopts a state of organizational conditions perspective and intends to test direct and indirect relationships among four constructs, a survey research design will serve as the data collection procedure.

Finally, given that the selected statistical modeling technique influences data collection and preparation decisions, it is important to acknowledge the reasoning for adopting a partial least squares structural equation modeling (PLS-SEM) technique. First, the research objective involves predicting and explaining the relationships among the four constructs (Hair, Ringle and Sarstedt 2011). Second, this research examines both direct and moderating effects (Chin, Marcolin and Newsted 2003). Third, as will be discussed in detail in the following sections, the constructs are measured with ordinal Likert scales (i.e., unknown distribution) and the model is recursive (Hair et al. 2014). Thus, given justification for the research design and statistical modeling technique, the remainder of this chapter outlines the specific method decisions, instruments, and procedures.

## Population and Sample Characteristics

The population of interest for this dissertation is organizations that are engaged in supply chain integration (i.e., internal-to-external implementation approach). Although it is difficult to identify a more specific target population based on supply chain integration survey research (Van der Vaart and van Donk 2008), sample demographics such as industry and organizational size will be reported (Forza 2002). This approach is referred to as random sampling in which the main benefit of this approach is the ability to generalize findings to the population (Kelley et al. 2003).

A recommended statistical power analysis method will assist in the sample size decision (i.e., Ringle, Sarstedt, and Straub 2012; Hair et al. 2014). Specifically, the method outlined by Cohen (1992) to determine the minimum sample size for statistical testing takes into account the desired statistical power ( $R^2 = 80\%$ ), targeted significance criterion ( $\alpha = 0.01$ ), appropriate effect size ( $f^2 = 0.15$ ), and number of exogenous variables ( $k = 2$ ). Based on these rigorous criteria, the minimum sample size for the proposed model is 97 organizations (Cohen 1992; Hair et al. 2014). However, since the moderating interaction term will yield 84 indicators, additional observations are required ( $n = 150$ ) and the sample goal is approximately 200 surveys (i.e., Chin et al. 2003).

## Data Collection Procedures

There are three overarching themes that relate to the data collection procedures. The first set of decisions involves the target survey respondents. The second set of decisions concerns the data collection medium. The third set of decisions relates to the general format and instructions of the survey. Accordingly, the below three paragraphs describe the data collection procedures and decisions associated with the target survey respondents, the selected data collection medium, and the general format and instructions of the survey.

A key informant that holds an operational middle-management position (e.g., purchasing/commodity/materials manager, senior buyer, operations manager, and purchasing engineer) is the ideal participant since the respondent is likely the most knowledgeable of the current state of both internal and supplier integration and better able to represent the views of individuals within the organization (Narasimhan and Das 2001; Keh and Xie 2009). Although the concern with a single informant involves measurement error issues (Phillips 1981), there are several justifications for this approach. First, the respondents have been selected based on their specialized operational knowledge and will be reporting on the organization rather than one's personal behavior (Phillips 1981; Chen et al. 2007). Second, cross-validation will be performed in which key respondents will be invited to provide the contact information for a second knowledgeable respondent (e.g., Reinartz et al. 2004). Third, a number of approaches have been adopted to proactively minimize single respondent bias (i.e., common method bias), including: separating the measurements (i.e., reducing consistency motif threats), protecting the respondent anonymity, controlling for priming effects (i.e., "this" organization rather than "your" organization), improving the scale items, and providing definitions of the terms (Podsakoff and Organ 1986; Podsakoff et al. 2003). Given that common method bias may be a threat despite these proactive steps (Campbell and Fiske 1959), a commonly recommended test for common method bias will be performed (i.e., Harman's single factor test via CFA) (i.e., Podsakoff et al. 2003; Jayamaha, Grigg and Mann 2008). Finally, given that survey responses are difficult to secure, a single informant approach is an accepted standard for supply chain integration survey research (Chen et al. 2007; VanderVaart and vanDonk 2008).

An online survey will be designed and electronically disseminated via Qualtrics software and panel data management (Qualtrics 2013) given that electronic surveys offer several benefits over mail surveys (Griffis et al. 2003). However, there are two key implications associated with

performing an online survey approach that must be addressed. First, response rates will be calculated and reported for the total invitations and for click-through since a non-response may be caused by external factors (e.g., email auto-filter) that prevent the receipt of an emailed survey (Hong and Harley 2011). Second, non-response bias will be evaluated by means of the Linear Extrapolation Method (Filion 1976) since Qualtrics panel data management does not allow for explicit non/respondent comparison analysis (Atif, Richards and Bilgin 2012). Specifically, the successive wave approach will be used to assign “wave membership,” in which this approach assumes late respondents after a follow-up stimulus are similar to non-respondents (Armstrong and Overton 1977). Accordingly, the data collection period will be approximately two months (October - November) and a follow-up email will be sent three weeks after an initial 150 surveys have been collected. The regression procedures outlined by Lambert and Harrington (1990) will be performed to validate the absence of non-response bias (i.e.,  $R^2$  and ANOVA F-statistics).

The general format and instructions of the survey will be organized similar to established supply chain integration survey research (i.e., Gimenez and Ventura 2003; Gimenez and Ventura 2005; Gimenez 2006). Specifically, respondents will be asked to answer two distinct elimination criteria questions based on the target population: (1) Is the organization engaged in supply chain integration; and (2) Has the organization executed an internal-to-external approach to implement supply chain integration. The qualified respondents will be asked to rate the degree of achieved internal integration, supply chain orientation, organizational identification, and achieved supplier integration. Based on the notion that organizations generally maintain supply chain relationships that range from arm’s length to collaborative (Cannon and Perreault 1999), respondents will be asked to rate the degree of achieved supplier integration (i.e., across functional departments) for the integrated supplier in which they are most familiar. The survey will conclude with requesting

descriptive data for the respondent (e.g., title and tenure) and for the organization (e.g., position within the supply chain, industry, number of employees, and approximate annual sales revenue) (Swink, Narasimhan and Wang 2007; Hong and Harley 2011). Finally, an institutional designated authority (Georgia Southern University) has approved the survey protocol (Appendix C) (NIH 2013), in which the intended survey instrument is provided (Appendix D).

### Instrumentation

All four constructs (i.e., achieved internal integration, organizational identification, supply chain orientation, and achieved supplier integration) will be measured with multiple-item scales (Appendix E). These multi-item scales are slightly modified versions of preexisting scales that have been adapted in order to (1) establish a 7-point Likert consistency across the four constructs of interest, (2) ensure a contextual agreement, and (3) maintain an organizational unit of analysis. First, Likert scale consistency is a recommended feature that relates to coding (i.e., symmetric and equidistant) (Hair et al. 2014), in which a common ordinal scale has been utilized to reduce response bias (Vagias 2006; Kline 2011; Hair et al. 2014). The 7-point Likert scale has also been applied since it ‘reaches the upper limits of scale reliability’ (Allen and Seaman 2007, p. 64).

Second, contextual agreement relates to adapting established achieved internal integration measurement items (i.e., Turkulainen and Ketokivi 2012) in order to capture achieved supplier integration. The reasoning and justification for this procedure is based on prior research that has examined an internal-to-external implementation approach to supply chain integration for the purpose of comparing internal integration and external integration levels (i.e., Gimenez 2006). Simply stated, an achieved state of integration for internal integration and supplier integration should be uniform so that the role of organizational identification can be accurately assessed.

Third, this dissertation research follows Corsten et al. (2011) in adapting individual-level organizational identification measurement items (i.e., Mael 1988) to capture an organizational unit of analysis for identification. Specifically, organizational identification has been extended to an organizational unit of analysis (Kogut and Zander 1996), in which the organizational level is derived from the individual level (Gundlach, Zivnuska and Stoner 2006; Corsten et al. 2011). The term, holographic organization (Albert and Whetten 1985), has been coined to depict such an organization where interdepartmental employees share a common organizational identity (i.e., organizational identification) (Ashforth and Mael 1989; Mael and Ashforth 1992).

Importantly, although Min and Mentzer's (2004) SCO measurement scale is commonly applied in SCM research (Esper, Defee and Mentzer 2010), there are two key limitations for the purpose of the current dissertation research. First, a number of the SCO scale items may cross-load with the achieved supplier integration scale items and/or create noise when considering the organizational identification scale items (Wong, Rindfleisch and Burroughs 2003). Second, the SCO scale items capture the process of implementing SCO in an organization (Min and Mentzer 2004) rather than as an achieved organizational state as the other three constructs in the proposed model. Thus, this dissertation adapts the joint SCM conditions construct that has been recently introduced by Kotzab et al. (2011). Although this construct has yet to be widely established in the literature, this construct is appropriate for this research since it reflects a SCO and is an achieved organizational state resulting from executing intra-organizational SCM strategies and structures.

Finally, considering that a number of the measurement items have been slightly modified and the constructs involve relationships and behaviors that occur within and across organizations, a small pilot study has been performed (Dillman et al. 2009). Specifically, piloting is a proactive approach to identify and address potential response problems prior to administering the survey

(Kelley et al. 2003). Given the feedback from three established academics and three practitioners, slight modifications to a number of the item's sentence structures were made for the purpose of clarity and comprehension (i.e., control for common method bias) (Podsakoff et al. 2003).

### Data Preparation

A number of preliminary data assessments will be performed before evaluating the model and testing the hypotheses. Specifically, in addition to checking for biases (i.e., common method, single respondent, and non-response), potential issues that will be addressed include suspicious response patterns, univariate outliers, normal distribution, and multicollinearity (Hair et al. 2010; Kline 2011; Hair et al. 2014). Given that the intended bias assessments have been described, the below paragraphs discuss intended procedures for examining the remaining four potential issues.

The first set of procedures will be identifying suspicious response patterns and detecting univariate outliers (Hair et al. 2010; Hair et al. 2014). First, although a validation item has been included in the survey in order to identify and remove observations that are deemed as careless responses (Meade and Craig 2012), visual assessment will be performed to avoid inconsistencies in the responses (Hair et al. 2014). Second, although univariate (i.e., single variable) outliers are generally not a concern when a Likert scale is operationalized (Kline 2011), extreme univariate outliers serve as an indication that the sample is not a valid representation of the population (Hair et al. 2010). Thus, univariate outliers will be assessed via graphical methods (i.e., box plots) and will be addressed according to common recommendations (Hair et al. 2014).

The second set of procedures will be assessing distribution and gauging multicollinearity. First, although PLS-SEM does not require normally distributed data, extreme non-normal data is problematic and will be evaluated based on the skew and the kurtosis values (i.e.,  $-1 \geq \text{value} \geq 1$ )

(Kline 2011; Hair et al. 2014). Second, given that multicollinearity can influence the structural model (i.e., path coefficients and weights), multicollinearity levels will be assessed by means of two measures (tolerance values  $> 0.2$ ; VIF values  $< 5$ ) (Hair et al. 2014).

### Measurement Model

The PLS-SEM model estimation and interpretation approach begins with evaluating the measurement model (Aibinu and Al-Lawati 2010). Evaluating the measurement model involves procedures associated with assessing the reliability and validity of the measurement items (Garver and Mentzer 1999). The central purpose of the measurement model procedures is to confirm that the model exhibits ‘sufficient robustness’ prior to examining the model’s explanatory power and testing the hypothesized relationships (Aibinu and Al-Lawati 2010). The following paragraphs delineate the procedures that will be performed via SmartPLS to assess reliability (i.e., scale and indicator) and validity (i.e., convergent and discriminant) of the reflective measurement items.

Reliability for quantitative research is described as “evaluation of measurement accuracy - the extent to which the respondent can answer the same or approximately the same questions the same way each time” (Straub 1989, p. 151). In other words, reliability is concerned with the consistency of the measurement scale (Garver and Mentzer 1999). This research takes a proactive approach to improve the likelihood of scale reliability by adopting and adapting preexisting item scales (Creswell 2009). Scale reliability will be assessed and validated with composite reliability for all the constructs (i.e.,  $0.70 \leq \rho_c \leq 0.95$ ) since Cronbach’s alpha often underestimates internal consistency reliability when performing PLS-SEM (Nunnally and Bernstein 1994; Hair et al. 2014). The individual item reliability (i.e., indicator reliability) will also be evaluated (i.e., outer loadings  $\geq 0.708$ ;  $\alpha \leq 0.05$ ) to establish that an individual item underlies one intended construct



and that the shared variance between an item and construct is greater than the measurement error variance (Aibinu and Al-Lawati 2010; Hair et al. 2014). Individual item reliability is a necessary condition for convergent validity (Garver and Mentzer 1999; Rutner et al. 2008; Hair et al. 2014).

Validity considerations for a quantitative research approach are generally concerned with measurement scales, latent variables, and constructs (Churchill 1992). There are two dimensions of validity when assessing the measurement model, namely convergent validity and discriminant validity (Garver and Mentzer 1999). Convergent validity refers to “the extent to which a measure correlates positively with alternative measures of the same construct” (Hair et al. 2014, p. 102). Specifically, convergent validity is achieved when the measurement items are correlated with the intended construct and will be evaluated with the average variance extracted (i.e.,  $AVE \geq 0.50$ ), which indicates the construct explains more of the measurement item variance than the remaining measurement item error (Fornell and Larcker 1981; Garver and Mentzer 1999; Hair et al. 2014). Discriminant validity is “the extent to which a construct is truly distinct from other constructs by empirical standards” (Hair et al. 2014, p. 104). Discriminant validity indicates the measurement items are able to differentiate between the intended construct and the other constructs in the model (Garver and Mentzer 1999). The two evaluation methods that will test for discriminant validity are cross-loadings analysis and the Fornell-Larcker criterion (i.e.,  $AVE > \text{squared correlation of construct pairs}$ ) (Fornell and Larcker 1981; Aibinu and Al-Lawati 2010; Hair et al. 2014).

### Structural Model

The second step in PLS-SEM model estimation and interpretation involves evaluating the structural model’s explanatory power and testing the developed hypotheses (Aibinu and Al-Lawati 2010; Hair et al. 2014). Thus, the first three paragraphs in this section describe the accepted PLS-

SEM structural model evaluation procedures (Hair et al. 2014). The remaining three paragraphs are dedicated to discussing the hypotheses testing procedures and interpretation. Specifically, the approaches for evaluating and interpreting the direct hypotheses (H1 and H2) will be described first, which will be followed with the moderating hypothesis (H3) procedures and interpretation.

The first measure for evaluating the explanatory power of the structural model will be the coefficient of determination ( $R^2$ ) (Hair et al. 2014). The coefficient of determination measures the amount of variance in the dependent variable (percentage) that is explained by the model, where a greater value represents greater predictive accuracy (Aibinu and Al-Lawati 2010; Hair et al. 2014). The general rule of thumb for interpreting the  $R^2$  values is given by: weak (0.25), moderate (0.50), and substantial (0.75) (Henseler et al. 2009; Hair et al. 2014). Although the adjusted  $R^2$  value will also be assessed for achieved supplier integration, this measurement will likely provide the same conclusions given that the model is not considered to be complex (Hair et al. 2014).

The second measure for evaluating the explanatory power of the structural model will be the effect size ( $f^2$ ) (Hair et al. 2014). The effect size is essentially a contribution measurement for each of the exogenous constructs. The procedure for assessing the effect size begins with a calculation that involves a change in the  $R^2$  value when an exogenous construct is included and then excluded from the model (Hair et al. 2014). This calculation will be performed individually for each of the exogenous variables in the model ( $f^2 = [(R^2_{\text{included}} - R^2_{\text{excluded}})/(1 - R^2_{\text{included}})]$ ). A general guideline for interpreting the specific  $f^2$  values is given by: small (0.02), medium (0.15), and large (0.35) (Cohen 1988; Hair et al. 2014).

The third and fourth measures are similar to the  $R^2$  and  $f^2$  measures; however, the Stone-Geisser's  $Q^2$  value and the  $q^2$  effect size are predictive relevance indicators rather than predictive accuracy indicators (Hair et al. 2014). The  $Q^2$  values will be calculated with the recommended

cross-validated redundancy approach (i.e., blindfolding procedure; omission distance = 9) and the  $q^2$  effect size will be calculated via the formula and the procedures outlined by Hair et al. (2014) ( $q^2 = [(Q^2_{\text{included}} - Q^2_{\text{excluded}})/(1 - Q^2_{\text{included}})]$ ). Accordingly, although there is not a general guide for an acceptable Stone-Geisser's  $Q^2$  value, a larger  $Q^2$  value is preferred ( $> 0$ ) and indicates that the exogenous construct being examined has greater predictive relevance (Ringle, Sarstedt and Mooi 2010). Moreover, the general guideline for interpreting the specific  $q^2$  values is given by: small (0.02), medium (0.15), and large (0.35) (Hair et al. 2014).

Assuming the explanatory power of the structural model will be sufficient, the two direct hypotheses will be tested first. Specifically, the standardized path coefficients are reported in the SmartPLS output ( $-1 < \text{value} < 1$ ), in which values that are close to zero are often non-significant. In order to test whether the hypothesized relationship is significant, a bootstrapping procedure is required (Hair et al. 2014). Importantly, the recommended number of cases is the data sample ( $n$ ) and number of subsamples is 5,000 (Hair et al. 2014). The bootstrapping command in SmartPLS yields a standard error that is required to calculate t-values (i.e.,  $1.96 = p \leq 0.05$ ). Although this is sufficient for path significance, p-values will be calculated for standard reporting (Hair et al. 2014). The first hypothesis (i.e., achieved internal integration  $\rightarrow$  organizational identification) is expected to have a significant, strong positive standardized path coefficient (i.e.,  $p \geq 0.5$ ;  $p \leq 0.05$ ) and the second hypothesis (i.e., organizational identification  $\rightarrow$  achieved supplier integration) is expected to have a significant, strong negative standardized path coefficient (i.e.,  $p \leq -0.5$ ;  $p \leq 0.05$ ).

Lastly, additional procedures will be performed for testing the third hypothesis due to the moderating effect. Considering that PLS-SEM assumes that a 7-point Likert scale will behave similar to a continuous scale and that the model is reflective, the product indicator approach will be performed (Hair et al 2014). This approach involves creating a latent interaction construct, in

which the manifest indicators are computed by multiplying each of the manifest indicators for the predictor (i.e., organizational identification) and moderator (i.e., supply chain orientation) latent variables ( $x*m = 84$ ) (Chin et al. 2003). Also, given that the scales are ordinal and the indicators are equivalent, the indicators will be standardized to a mean of zero and variance of one (Chin et al. 2003). Although standardizing is performed via a command in SmartPLS (Hair et al. 2014), the calculation involves dividing each indicator score mean by the related standard deviation (Chin et al. 2003). A bootstrapping procedure will again yield the path coefficients and standard errors to determine whether the main and interaction effects are significant (Chin et al. 2003). In order to assess the impact of the interaction effects, the explanatory power between the main effects and the direct effects models will be compared ( $f^2 = [R^2(\text{simple effects}) - R^2(\text{direct effects})]/R^2(\text{simple effects})$ ) via effect size evaluation (Cohen 1988; Chin et al. 2003).

The standardized path coefficient between the created interaction variable and dependent variable is expected to be significant and strongly positive (i.e.,  $p \geq 0.5$ ;  $p \leq 0.05$ ).<sup>2</sup> In fact, the standardized path coefficient is expected to be similar in magnitude as the second hypothesis (i.e., organizational identification  $\rightarrow$  achieved supplier integration). The logic for this expectation is due to the interpretation and expectation that the negative effect organizational identification has on achieving supplier integration is mitigated by supply chain orientation. In other words, the sum of the standardized path coefficients is expected to be close to zero (i.e., one standard deviation increase in supply chain orientation will eliminate the negative effect organizational identification has on achieving supplier integration) (Chin et al. 2003; Hair et al. 2014), therefore supporting the third hypothesis and indicating that supply chain orientation does not threaten organizational identification but rather mitigates the negative external behaviors.

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<sup>2</sup> Although not formally hypothesized, supply chain orientation is expected to have a strong direct effect on achieved supplier integration (i.e.,  $p \geq 0.5$ ;  $p \leq 0.05$ ).

## CHAPTER 4

### DATA ANALYSIS AND RESULTS

The purpose of this chapter is to report and summarize the research findings. This chapter is organized as follows. First, the data collection and sample characteristics will be described. Second, the procedures for assessing the preliminary data will be discussed (i.e., cross-validation, common method bias, non-response bias, outliers, distribution, and multicollinearity). Third, the measurement model will be evaluated (i.e., reliability and validity). Fourth, the structural model will be evaluated via PLS-SEM (i.e., path and power). Fifth, the hypothesis test results and their implications will be interpreted. Lastly, this chapter concludes with a CB-SEM post hoc analysis.

#### Data Collection and Sample

The data were collected in 2013 during October and November. The survey was emailed to 6,972 potential respondents (Qualtrics panel) that yielded 227 complete observations. The first wave ( $n = 15$ ) was collected in two days (October 16<sup>th</sup> and 17<sup>th</sup>) and data collection was paused while the initial responses were evaluated. The second wave ( $n = 145$ ) was collected in two days (October 20<sup>th</sup> and 21<sup>st</sup>) and data collection was again paused. Approximately three weeks later, a reminder email was sent to the non-respondents ( $n = 67$ ) and the final data were collected in a day (November 5<sup>th</sup>). Thus, the next paragraph delineates the 33.28% click-through response rate.

A total of 682 survey participants began the survey (clicked through) and a total of 455 surveys were omitted. Specifically, 356 participants were removed from participating based on the two target respondent questions (196 eliminated) and the two target population questions (160 eliminated). Regarding the target respondent elimination questions, 149 did not have operational knowledge of both internal and external organizational conditions whereas 47 did not regularly

interact with their organization's frontline supervisors and at least one direct supplier's frontline supervisors and/or operations managers. Regarding the target population elimination questions, 117 were not engaged in supply chain integration and another 43 were eliminated for adopting an external-to-internal implementation approach. Finally, 45 respondents were eliminated based on failing the validation question and 54 respondents did not complete the entire survey. Appendix F provides a numerical table for the described click-through response rate. Accordingly, the final 33.28% (227/682) click-through response rate exceeds what is often achieved in the supply chain literature for traditional random mail surveys (< 20%) (Griffis et al. 2003) and for online third-party administered panel surveys (e.g., 27.6% and 20.85%) (Autry, Skinner and Lamb 2006).

The respondent sample consisted largely of operational middle/upper middle management (55%) with more than five years of experience with their current employer (77%), which was the target respondent group based on contextual and theoretical literature (Narasimhan and Das 2001; Keh and Xie 2009). As shown in Table 2 below, the sample organizations operate across diverse supply chain positions and industries. Finally, the sample organizations were more representative of U.S. organizations in terms of size than most supply chain integration studies (Pagell 2004).

Table 2. Descriptive Statistics of Responding Organizations

<b>Respondent Title</b>	Number (n)	Percent (%)	<b>Respondent Tenure</b>	Number (n)	Percent (%)
CEO/Executive/Owner	8	4%	Less than 1 year	7	3%
Director/VP	64	29%	1 - 3 years	24	11%
Plant/Office/General Manager	24	11%	3 - 5 years	20	9%
Operations/Department/Project Manager	97	44%	5 - 7 years	31	14%
Supervisor/Frontline Employee	26	12%	Greater than 7 years	137	63%
<b>Industry</b>	Number (n)	Percent (%)	<b>Supply Chain Position</b>	Number (n)	Percent (%)
Automotive	14	6%	Retailer	41	19%
Apparel/textiles	7	3%	Wholesaler or distributor	34	16%
Electronics	20	9%	Manufacturer	80	37%
Chemicals/plastics	8	4%	Supplier to a manufacturer	6	3%
Medical/pharmaceutical	25	11%	3PL or 4PL	4	2%
Consumer packaged goods	18	8%	Other	54	25%
Industrial parts	18	8%			
Other	109	50%			
<b>Firm Size (Employees)</b>	Number (n)	Percent (%)	<b>Firm Size (Annual Sales)</b>	Number (n)	Percent (%)
1 - 49	34	16%	Less than \$1 million	15	7%
50 - 249	37	17%	\$1 - \$50 million	58	26%
250 - 499	17	8%	\$51 - \$500 million	43	20%
500 - 999	21	10%	\$501 million - \$1 billion	29	13%
1,000 - 2,500	18	8%	Greater than \$1 billion	74	34%
Over 2,500	92	42%			

Descriptive statistics are based on the final sample (n = 219)

## Preliminary Data

Considering that this dissertation uses a single respondent to collect data, cross-validation has been performed to validate the original participant's responses (i.e., assessing the degree of measurement error due to a single respondent approach) (Phillips 1981; Reinartz et al. 2004). In order to collect data to perform the cross-validation analysis, original participants were invited to provide contact information for a second knowledgeable respondent. Importantly, from the 227 completed surveys, only 11 of the respondents provided an email address for a colleague with a similar job title and that would be interested in completing the survey. A survey was created for each of the 11 potential cross-validation respondents in order to correctly match respondent pairs and was distributed to potential respondents as early as possible to avoid temporal bias (Reinartz et al. 2004). Although the survey questions were limited to the four construct measurement items as a means to improve response likelihood, only one of the matched respondents completed the survey. Nevertheless, Appendix G reports the results (i.e., fails to be significantly different).

Common method bias has been evaluated (Harman's single factor test via CFA), and was deemed as not an issue since the total variance explained by one factor was less than half (40.5%) (i.e., Podsakoff et al. 2003). Although the total variance was slightly large, a number of proactive approaches have been adopted to minimize the risk of a common method bias (i.e., separating measurements, protecting respondent anonymity, controlling for priming effects, improving scale items, and reporting definitions) (Podsakoff and Organ 1986; Podsakoff et al. 2003). Thus, likely due to the proactive approaches, the test results indicate that common method bias is minimal.

Non-response bias was assessed and was not problematic. Specifically, except for two indicators (II2 and OI6) the mean responses between the first two waves (i.e., early respondents) and the late respondents (i.e., non-respondents proxy) fail to be significantly different (ANOVA

F-statistics). Post hoc analysis that accounts for unequal sample sizes (i.e., Tukey HSD) signals there is only a marginal mean response difference for the organizational identification indicator (OI6;  $p = 0.03$ ) between the second wave respondents and the late respondents (Appendix H). Next, existence of non-response bias was assessed with the Linear Extrapolation Method (Filion 1976), which involves estimating individual regression models and assessing  $R^2$  values (Lambert and Harrington 1990). As reported in Appendix I, the substantially low  $R^2$  values suggest that responses for the 31 construct indicators are not significantly explained by cumulative response rates (i.e., first and second wave and non-respondents). Thus, given the collective results of the two evaluation approaches, non-response bias was determined not to be a considerable problem.

The extreme univariate outliers were identified via boxplots, in which eight observations were eliminated from the analysis given that these organizations did not fulfill the requirements of the target population. Specifically, the elimination criterion was greater than three standard deviations from the mean on indicators across two or more constructs. As shown in Appendix J, eight observations were responsible for 47 of the 66 very extreme outliers as well as for 35 of the mild-to-extreme outliers ( $\pm 2-3$  standard deviations from the mean). Justification for eliminating these observations was based on the condition that if an organization was truly engaged in supply chain integration, there should not be very extreme lower-bound outliers (i.e., greater than three standard deviations from the mean) for both achieved internal integration and achieved supplier integration. Thus, the following analyses were performed with the remaining 219 observations.

Given that observations were eliminated, boxplots were created with the final dataset and normal distribution was assessed. The boxplots identified a number of outliers (Appendix K), which were likely responsible for the moderate distribution skew and kurtosis. Thus, 75 extreme outliers (1.07% of the data) were truncated within two standard deviations from the mean



(Aguinis, Gottfredson and Joo 2013). The result of this conservative transformation was data that are normally distributed (skew and kurtosis values  $\leq |1|$ ) (Appendix L) (Hair et al. 2014).<sup>3</sup> Finally, multicollinearity was assessed and determined as not problematic (tolerance values  $> 0.2$ ; VIF values  $< 5$ ) (Hair et al. 2014). Considering the data adhere to standard SEM assumptions and requirements, the following section involves evaluating the PLS-SEM measurement model.

### Measurement Model

The individual indicator reliability was assessed first (i.e., outer loading  $\geq 0.708$ ;  $p < 0.05$ ) (Hair et al. 2014), in which all six of the indicators for achieved internal integration and achieved supplier integration exceeded the threshold standard. However, two organizational identification indicators (OI1 = 0.493; OI6 = 0.562) and 11 supply chain orientation indicators (SC1 = 0.689; SC3 = 0.591; SC4 = 0.643; SC6 = 0.654; SC7 = 0.680; SC8 = 0.691; SC9 = 0.608; SC10 = 0.588; SC11 = 0.662; SC12 = 0.631; SC13 = 0.680) fell below the minimum threshold. In following the recommended procedures for the outer loading relevance testing (i.e.,  $0.4 > \text{outer loadings} < 0.7$ ), construct indicators were removed individually and the impact on composite reliability and AVE were assessed (Hair et al. 2014). Given these criteria, two organizational identification indicators (OI1 and OI6) and five supply chain orientation indicators (SC3, SC9, SC10, SC11, and SC12) were removed. Since three supply chain orientation indicators (SC10, SC11, and SC12) were contingent on a responding organization's supply chain position, operations, and/or information availability (e.g., exchanges forecast information) and the remaining nine indicators capture the nature of supply chain orientation, this construct was deemed acceptable. Lastly, scale reliability was deemed sufficient based on the composite reliability values (i.e.,  $> 0.80$ ) (Hair et al. 2014).

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<sup>3</sup> Although 37 observations indicated multivariate outlier concerns (i.e., Mahalanobis Distance;  $\alpha \leq 0.05$ ), subsequent CB-SEM model fit assessment failed to substantially improve by individually removing 19 observations ( $n = 200$ ).

Convergent validity and discriminant validity have been assessed and verified for all four constructs. Convergent validity was assessed based on the AVE values, in which after removing the five supply chain orientation indicators, all the AVE values satisfied the minimum threshold (i.e.,  $AVE \geq 0.50$ ) (Hair et al. 2014). Discriminant validity was assessed based on cross-loading analysis and the Fornell-Larcker criterion (Hair et al. 2014). Accordingly, all the loadings were the greatest for the appropriate constructs and the Fornell-Larcker criterion was satisfied. The following Table 3 reports the discussed PLS-SEM measurement model evaluation results.

Table 3. Measurement Model Evaluation Results (PLS-SEM)

Construct	Item Indicators	Outer Loadings				Composite Reliability	Fornell-Larcker Criterion			
		II	OI	SC	SI		II	OI	SC	SI
Achieved Internal Integration (II)	II1	0.858	0.457	0.514	0.455	0.947	0.749	0.238	0.368	0.358
	II2	0.863	0.423	0.455	0.521					
	II3	0.847	0.400	0.524	0.474					
	II4	0.830	0.374	0.522	0.530					
	II5	0.884	0.434	0.581	0.580					
	II6	0.908	0.437	0.555	0.553					
Organizational Identification (OI)	OI2	0.422	0.841	0.498	0.523	0.895	0.488	0.681	0.314	0.321
	OI3	0.377	0.776	0.437	0.439					
	OI4	0.411	0.852	0.457	0.446					
	OI5	0.397	0.828	0.454	0.455					
Supply Chain Orientation (SC)	SC1	0.475	0.460	0.723	0.524	0.902	0.607	0.561	0.507	0.500
	SC2	0.478	0.398	0.757	0.510					
	SC4	0.405	0.371	0.652	0.486					
	SC5	0.513	0.474	0.754	0.557					
	SC6	0.449	0.397	0.664	0.531					
	SC7	0.333	0.331	0.709	0.464					
	SC8	0.393	0.345	0.703	0.497					
	SC13	0.352	0.380	0.696	0.466					
SC14	0.462	0.418	0.741	0.478						
Achieved Supplier Integration (SI)	SI1	0.534	0.483	0.605	0.853	0.947	0.599	0.567	0.707	0.750
	SI2	0.537	0.502	0.578	0.859					
	SI3	0.481	0.454	0.577	0.845					
	SI4	0.507	0.457	0.662	0.851					
	SI5	0.550	0.539	0.626	0.890					
	SI6	0.501	0.508	0.622	0.898					

Note: AVE values are presented on the diagonal, correlations are below the diagonal, and squared correlations are above the diagonal.

### Structural Model

Three models were developed in SmartPLS for the purposes of assessing the explanatory power of the structural model (i.e., predictive accuracy and relevance) and for evaluating the path coefficients among the constructs (i.e., values and significance). As illustrated in Appendix M,

the main effects model (model A) is the most basic model that does not include the supply chain orientation construct. The direct effects model (model B) captures the direct relationship between supply chain orientation and achieved supplier integration. The simple effects model (model C) is essentially the proposed model that captures supply chain orientation as a moderating construct (i.e., organizational identification \* supply chain orientation interaction term). Accordingly, this section begins by providing an explanation for creating and fully evaluating these three models. The explanatory power of the three structural models will then be assessed and compared, which will be followed by evaluating the path coefficients among the constructs for the three models.

One reason for evaluating multiple models is based on the recommended procedures. For example, the main effects (model A) organizational identification → achieved supplier integration path coefficient specifies the second hypothesized relationship (Hair et al. 2014). However, as a means to appropriately interpret the effects of the moderator, the organizational identification → achieved supplier integration path coefficient is to be compared between the main effects (model A) and the simple effects (model C) (Hair, Ringle and Sarstedt 2013; Hair et al. 2014). A second reason for evaluating multiple models is based on providing additional insight beyond the three proposed hypotheses. For example, although a direct relationship was not formally hypothesized between supply chain orientation and achieved supplier integration, the direct effects (model B) provides additional insight as to the role of supply chain orientation given an internal-to-external implementation approach for supply chain integration. Moreover, by comparing the explanatory power of the direct effects structural model (B) with the simple effects structural model (C), this allows for measuring the effect sizes ( $f^2$ ;  $q^2$ ) for all of the exogenous constructs (e.g., excluding organizational identification would effectively remove the supply chain orientation moderator and the structural model would reduce to supply chain orientation → achieved supplier integration).

The main effects model (model A) was first evaluated on predictive accuracy, in which the achieved supplier integration  $R^2$  value was 0.322 ( $R^2_{\text{adj}} = 0.323$ ) and considered to be between moderate and weak in terms of predictive accuracy ( $< 0.50$ ;  $> 0.25$ ) (Hair et al. 2014). Moreover, the  $R^2$  value for organizational identification was 0.238 ( $R^2_{\text{adj}} = 0.239$ ) and deemed as weak with regards to the predictive accuracy ( $< 0.25$ ) (Hair et al. 2014). An important consideration that relates to both of these  $R^2$  values (organizational identification  $\rightarrow$  achieved supplier integration; achieved internal integration  $\rightarrow$  organizational identification) is that only one exogenous construct is contributing to the  $R^2$  value. Thus, based on the main effects model (model A) the contribution of organizational identification on achieved supplier integration should be interpreted as a large effect size while the contribution of achieved internal integration on organizational identification should be interpreted as a moderately large effect size (Cohen 1988; Hair et al. 2014).

The direct effects model (model B) was also evaluated on predictive accuracy. Given that this model also includes the direct supply chain orientation construct, it was anticipated that the achieved supplier integration  $R^2$  value would be greater than the main effects model (model A). Accordingly, the achieved supplier integration  $R^2$  value was 0.543 ( $R^2_{\text{adj}} = 0.548$ ) and considered to be moderately accurate ( $> 0.50$ ) (Hair et al. 2014). The effect size ( $f^2$ ) was then calculated to assess the contribution of organizational identification ( $f^2 = 0.092$ ; small/medium) and the direct supply chain orientation construct ( $f^2 = 0.484$ ; very large) on achieved supplier integration. Thus, based on the effect sizes and the  $R^2$  values ( $R^2_{\text{modelA}} = 0.322$ ;  $R^2_{\text{modelB}} = 0.543$ ), it was concluded that the direct effects model (model B) is superior with regards to predictive accuracy.

Finally, the simple effects model (model C) was also evaluated on the predictive accuracy (Hair et al. 2014). The achieved supplier integration  $R^2$  value was 0.544 ( $R^2_{\text{adj}} = 0.549$ ) and was nearly identical to the  $R^2$  value as the direct effects model (model B). Accordingly, the predictive

accuracy was considered as moderately accurate ( $> 0.50$ ) (Hair et al. 2014). The effect size ( $f^2$ ) was also calculated in order to assess the contribution of the supply chain orientation moderator construct on achieved supplier integration ( $f^2 = 0.002$ ; null). Based on the comprehensive results, satisfactory predictive accuracy was attributed to organizational identification and the direct path between supply chain orientation and achieved supplier integration (Hair et al. 2014).

The main effects model (model A) was also evaluated on predictive relevancy (Hair et al. 2014). Therefore, via the blindfolding procedure (omission distance = 9) the  $Q^2$  value associated with achieved supplier integration was 0.238 (Hair et al. 2014). The organizational identification  $Q^2$  value associated with achieved internal integration was generated with the same blindfolding procedure ( $Q^2 = 0.156$ ). Although the  $Q^2$  values range between 0 and 1, in which a greater value indicates greater predictive relevancy, there fails to be a standard rule of thumb for interpretation. However, since the  $Q^2$  values relate to one exogenous construct (i.e., organizational identification  $\rightarrow$  achieved supplier integration; achieved internal integration  $\rightarrow$  organizational identification), both  $Q^2$  values were interpreted equivalent to the effect size ( $q^2 = \text{medium}$ ) (Hair et al. 2014).

The direct effects model (model B) was evaluated on predictive relevancy. The  $Q^2$  value associated with achieved supplier integration was 0.401, which indicated a satisfactory predictive relevance (Hair et al. 2014). Considering that two constructs were contributing to the  $Q^2$  value, it was expected that the direct effects model would have greater predictive relevancy than the main effects model (model A). The effect size ( $q^2$ ) was then calculated for organizational identification ( $q^2 = 0.049$ ; small/medium) as well as for the direct supply chain orientation construct ( $q^2 = 0.273$ ; medium/large) on achieved supplier integration (Hair et al. 2014). Therefore, given these effect sizes and the  $Q^2$  values ( $Q^2_{\text{modelA}} = 0.238$ ;  $Q^2_{\text{modelB}} = 0.401$ ), the direct effects model (model B) was deemed to perform best with regards to predictive relevancy.

Finally, the simple effects model (model C) was evaluated on predictive relevancy. The  $Q^2$  value associated with achieved supplier integration was 0.401, which was the same  $Q^2$  value as the direct effects model (model B). The effect size for the supply chain orientation moderator on achieved supplier integration was calculated ( $q^2 = 0.000$ ; null). Based on the comprehensive results, the satisfactory predictive relevancy was attributed to organizational identification and the direct path between supply chain orientation and achieved supplier integration (Hair et al. 2014).

In sum, the explanatory power assessment (i.e., predictive accuracy and relevance) across the three structural models provided insight with regards to the role of the four constructs. First, achieved internal integration performed well in explaining the variance ( $R^2$ ) and in predicting the data points ( $Q^2$ ) of organizational identification. Second, organizational identification yielded sufficient evidence of predictive accuracy ( $R^2$ ;  $f^2$ ) and predictive relevance ( $Q^2$ ;  $q^2$ ) with regards to achieved supplier integration. Third, although the explanatory power assessment indicated that the supply chain orientation moderator failed to adequately contribute to the structural model, the direct effect of supply chain orientation on achieved supplier integration considerably contributed to the power of a parsimonious structural model (Hair et al. 2014). Thus, although a direct effect among supply chain orientation and achieved supplier integration was not formally hypothesized, the structural model explanatory power analysis provided adequate justification for reporting path coefficient assessment for supply chain orientation  $\rightarrow$  achieved supplier integration (model B).

The path coefficients for all three models were evaluated with regards to the values and significance. As expected, the path coefficient for achieved internal integration  $\rightarrow$  organizational identification was highly significant and strongly positive ( $p = 0.488$ ;  $p < 0.000$ ). Unexpectedly, although all the path coefficients for organizational identification  $\rightarrow$  achieved supplier integration were significant ( $p < 0.000$ ), the path coefficient values were moderately positive for both SCO

models (model B = 0.248; model C = 0.239) and strongly positive for the main effects model (model A = 0.568). As anticipated based on the structural model explanatory power analysis, the supply chain orientation → achieved supplier integration path coefficient was highly significant ( $p < 0.000$ ) and strongly positive for both models (model B = 0.568; model C = 0.567). Despite the results of these direct effect paths, the supply chain orientation moderator → achieved supplier integration path coefficient was weak and negative ( $p = -0.038$ ). As reported in Table 4, only the supply chain orientation moderator → achieved supplier integration path failed to be significant.<sup>4</sup>

Table 4. Structural Model Path Coefficient Assessment

Structural Model Path	Path Coefficient	Standard Error	t-value (p-value)
Structural Model A (Main Effects)			
Achieved Internal Integration → Organizational Identification	0.488	0.066	7.411***
Organizational Identification → Achieved Supplier Integration	0.568	0.047	12.037***
Structural Model B (Direct Effects)			
Achieved Internal Integration → Organizational Identification	0.488	0.065	7.456***
Organizational Identification → Achieved Supplier Integration	0.248	0.053	4.663***
Supply Chain Orientation (IV) → Achieved Supplier Integration	0.568	0.051	11.159***
Structural Model C (Simple Effects)			
Achieved Internal Integration → Organizational Identification	0.488	0.065	7.547***
Organizational Identification → Achieved Supplier Integration	0.239	0.055	4.312***
Supply Chain Orientation (IV) → Achieved Supplier Integration	0.567	0.052	10.895***
Supply Chain Orientation (M) → Achieved Supplier Integration	-0.038	0.079	0.480 <sup>N.S.</sup>

A bootstrapping procedure was executed (i.e., 219 cases; 5,000 samples) to determine whether the path coefficients were statistically significant. \*\*\* denotes p-value < 0.000

### Hypothesis Testing Discussion

The purpose of this dissertation has been to examine organizational identification within a supply chain management context. Accordingly, three theoretically grounded hypotheses were developed and empirically tested via PLS-SEM. As described in the preceding section, the path

<sup>4</sup> ( $f^2 = [R^2(\text{simple effects model C}) - R^2(\text{direct effects model B})] / R^2(\text{simple effects model C}) \Rightarrow f^2 = 0.002$ ) suggests that the effect size of the interaction term was nearly undetectable (Cohen 1988; Chin et al. 2003).

coefficients for achieved internal integration → organizational identification and organizational identification → achieved supplier integration were significantly positive and the path coefficient for the supply chain orientation moderator → achieved supplier integration was not significant. Therefore, while Table 5 summarizes the hypothesis test results, the remainder of this section is dedicated to interpreting the three hypothesis test results and the individualized implications.

Table 5. Summary of Hypothesis Test Results

Hypothesis	Findings	Conclusion
<b>H1:</b> Achieved internal integration has a positive effect on organizational identification.	(0.488; $p < 0.00$ )	Supported
<b>H2:</b> Organizational identification has a negative effect on achieving supplier integration.	(0.568; $p < 0.00$ )	Not Supported
<b>H3:</b> SCO mitigates the negative effect organizational identification has on achieved supplier integration.	(-0.038; N.S.)	Not Supported

The first hypothesis was supported in expecting a strong positive effect between achieved internal integration and organizational identification. The hypothesized positive effect originates from two sources. First, the common internal integrative organizational structures and strategic policies and tactical/operational activities are parallel to a number of organizational identification antecedents (e.g., Ashforth and Mael 1989; Pagell 2004). Second, there are several similarities between the in-group behaviors that reinforce and strengthen organizational identification and the behaviors attributed to achieved internal integration (e.g., Dutton et al. 1994; O’Leary-Kelly and Flores 2002). Therefore, as hypothesized, the significant and strongly positive path coefficient between achieved internal integration and organizational identification suggests achieved internal integration increases the tendency and strength of organizational identification.

The second hypothesis was not supported in anticipating a strong negative effect between organizational identification and achieved supplier integration. Particularly interesting is that the hypothesis was not supported since the path coefficient was significantly positive. This empirical



finding yields two valuable implications. First, organizational identification does not necessarily lead organizations to attribute supplier firms as an out-group (i.e., hypothesized phenomenon that would be responsible for a negative path coefficient) (i.e., Turner 1975; 1985). Second, given that organizational identification prompts behavior that best serves organizational interests (i.e., van Knippenberg and Sleebos 2006), a significant positive path coefficient implies organizations view supplier integration (i.e., integrative behaviors) as a condition that will benefit their organization.

The third hypothesis was not supported in anticipating that supply chain orientation would mitigate (i.e., negatively moderate) the negative effect organizational identification was expected to have on achieved supplier integration (i.e., Brewer 1996; Mentzer et al. 2001). Given that the second hypothesis and the direct path between supply chain orientation and achieved supplier integration were significantly positive, the post hoc expectation (based on empirical results) was supply chain orientation would further strengthen the positive effect organizational identification has on achieved supplier integration. However, the results of the third hypothesis suggest that organizational identification and supply chain orientation are discrete phenomena that occur in a firm; where both independently have a significant positive effect on achieved supplier integration.

As demonstrated by the above hypothesis testing discussion, the empirical results yielded a number of unexpected relationships among the constructs of interest. Specifically, finding that organizational identification has a positive effect on achieved supplier integration was the most interesting outcome of this research. Taking into account the first two hypothesized relationships were significantly positive (i.e., achieved internal integration → organizational identification → achieved supplier integration), a post hoc mediation analysis was deemed necessary as a means to better understand the role of organizational identification. Thus, this chapter concludes with a post hoc CB-SEM analysis of organizational identification in a supply chain integration context.

## Post Hoc Analysis

Considering the hypothesis test results associated with organizational identification, this section is dedicated to performing a post hoc CB-SEM evaluation of organizational identification within a supply chain integration context. Specifically, although a formal hypothesis has not been developed for examining organizational identification as a mediating construct between achieved internal integration and achieved supplier integration, the following analysis begins with assessing CB-SEM model fit<sup>5</sup> and then continues to test the mediating role of organizational identification. This section concludes with interpreting and briefly summarizing the analysis results.

The structural model (Appendix O) was estimated via maximum likelihood (ML), in which the results indicated a satisfactory model fit. Although the overall model fit test was rejected ( $X^2 = 252.95$ ;  $p < 0.000$ ), the majority of the common baseline comparison indexes satisfied generally accepted thresholds. Specifically, these baseline comparison indexes included the Incremental Fit Index (IFI = 0.944), Tucker-Lewis Index (TLI = 0.932), and Comparative Fit Index (CFI = 0.943) (Kline 2005). The CB-SEM structural model also adhered to the acceptable fit recommendation for Standardized Root Mean Squared Residual (SRMR = 0.039) as well as a reasonable value for Root Mean Square Error of Approximation (RMSEA = 0.083) (Kline 2005).

The CB-SEM structural model also yielded significantly positive path coefficients among the three constructs of interest (i.e., achieved internal integration → organizational identification → achieved supplier integration). In order to determine whether the construct relationships were also indirect, mediation was evaluated via a bias-corrected (95%) bootstrapping procedure in AMOS (ML estimation). Although Sobel's test was performed to validate these results, bias-corrected bootstrapping is considered a more rigorous and accepted mediation testing approach

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<sup>5</sup> Given that CB-SEM assumptions have been assessed and verified as part of the preliminary data section, Appendix N reports the satisfactory CB-SEM measurement model evaluation results.

(Hayes 2013). Importantly, both mediation-testing approaches require capturing data from direct path models (i.e., achieved internal integration → achieved supplier integration; achieved internal integration → organizational identification) and from the mediated path model. As demonstrated by the following mediation test results (Table 6), organizational identification partially mediated the relationship between achieved internal integration and achieved supplier integration.

Table 6. Mediation Test Results

Model	Path Statistics			Mediation Test
Direct	(IV → DV)	std $\beta = 0.642$	$p < 0.000$	Bootstrap: Indirect Effect (two-tail) $p < 0.000$
Mediated	(IV → DV)	std $\beta = 0.427$	$p < 0.000$	
Direct	(IV → M)	unstd $\beta = 0.497$	std error = 0.073	Sobel's Test Statistic (p-value) 4.165 ( $p < 0.000$ )
Mediated	(M → DV)	unstd $\beta = 0.416$	std error = 0.079	

This post hoc CB-SEM evaluation of organizational identification within a supply chain integration context has revealed that the positive effect that achieved internal integration has on achieved supplier integration is partially mediated by organizational identification. Specifically, the mediation test results indicate that achieved internal integration has a direct positive effect on achieved supplier integration (i.e.,  $\beta = 0.642$ ;  $p < 0.000$ ) and a positive effect on organizational identification (i.e.,  $\beta = 0.539$ ;  $p < 0.000$ ). Moreover, organizational identification subsequently has a positive effect on achieved supplier integration (i.e.,  $\beta = 0.395$ ;  $p < 0.000$ ) and the achieved internal integration → achieved supplier integration relationship reduces ( $\beta = 0.427$ ;  $p < 0.000$ ) when organizational identification is introduced as a mediator. Thus, organizational identification accounts for a portion of the total effect achieved internal integration has on achieved supplier integration (i.e.,  $0.642 - 0.427 = 0.215$ ;  $p < 0.000$ ). The test results can be interpreted as follows. Given a firm that has achieved internal integration, greater levels of organizational identification will be present, which will ultimately further increase the degree of achieved supplier integration (i.e., organizational identification provides insight into implementing supply chain integration).

## CHAPTER FIVE

### CONCLUSION

The purpose of this final chapter is to discuss the implications and contributions of this dissertation as well as to identify the research limitations and future research directions. First, the implications as to why two of the three hypotheses were not supported will be discussed. Also, based on the collective empirical assessment, the theoretical and managerial implications will be summarized, respectively. Second, both the theoretical and the managerial contributions will be revisited and revised based on the empirical findings. Third, the research limitations will be identified. Finally, a number of future research directions will be proposed that were derived from the current research limitations and findings as well as extant supply chain literature needs.

#### Dissertation Implications

This section summarizes the overarching implications that are grounded on the collective empirical findings. In sum, the formal hypothesis tests suggest that achieved internal integration has a positive effect on organizational identification, organizational identification has a positive effect on achieving supplier integration, and SCO fails to moderate the relationship between organizational identification and achieved supplier integration. The results also confirmed that SCO yields a strong positive direct effect on achieved supplier integration. Lastly, the post hoc analysis indicates that organizational identification partially mediates the relationship between achieved internal integration and achieved supplier integration. Considering that two of the three hypotheses were not supported, this section begins with discussing the implications as to why hypothesis 2 and hypothesis 3 were not supported. The remainder of this section focuses on the theoretical and managerial implications associated with the actual empirical results.

### *Counter-Hypothesis Implications*

The second hypothesis was not supported in anticipating a strong negative effect between organizational identification and achieved supplier integration. Particularly interesting is that the hypothesis was not supported since the path coefficient was significantly positive. As previously discussed, this empirical outcome suggests that organizational identification does not necessarily lead organizations to attribute supplier organizations as an out-group (i.e., Turner 1975; 1985) and that organizations view supplier integration as a condition that will benefit their organization (i.e., vanKnippenberg and Sleebos 2006). Accordingly, an additional implication from interpreting these results may supplement extant supply chain literature findings. Specifically, Stank et al. (2001) concluded that an overall behavioral change within an organization might be responsible for favorable internal and external attitudes and relationships (i.e., synergistic). As it relates to the current research, organizational identification may be a source of such an overall behavioral change where a shared sense of solidarity and unity within an organization (Foote 1951) prompts advantageous internal behaviors as well as advantageous external behaviors.

The third hypothesis was not supported in anticipating that supply chain orientation would mitigate (i.e., negatively moderate) the negative effect organizational identification was expected to have on achieved supplier integration (i.e., Brewer 1996; Mentzer et al. 2001). As previously discussed, the results of the third hypothesis suggest that organizational identification and supply chain orientation are discrete phenomena that occur within a firm; in which both independently have a significant positive effect on achieved supplier integration. Thus, further interpreting these results yield an additional implication that challenges extant supply chain management theoretical literature. Specifically, although seminal literature suggests supply chain orientation is central to successfully extend internal integration to external integration (i.e., prompting an outward focus)

(Mentzer et al. 2001), this dissertation research has found an internally focused phenomenon (i.e., organizational identification) that also contributes to an internal integration → external integration relationship. The overarching implication is, contrary to a key premise of supply chain literature, internally focused motives encourage supply chain integration (i.e., positive external behaviors).

### *Theoretical Implications*

The theoretical implications of this dissertation are twofold. First, with regards to the SIT literature, this research has found that organizational identification antecedents are not limited to the three conditions and group formation factors (Ashforth and Mael 1989). Rather, this research establishes that a range of efforts for eliminating a functional silo approach (e.g., decentralization, informal interactions, information systems, measurement and reward systems, grouping, manager support, cross-training programs, and establishing teams) (Pagell 2004) increases the tendency of organizational identification. Moreover, this dissertation research establishes that the behaviors associated with successfully achieving internal integration (cooperation, coordination, interaction, and collaboration) (O’Leary-Kelly and Flores 2002) contribute to self-reinforcing behaviors of organizational identification (Dutton et al. 1994). Thus, a principal SIT theoretical implication is organizational identification can be an unexpected outcome of strategic and tactical SCM actions.

Second, with regards to supply chain integration theoretical implications, this dissertation research found that organizational identification explains a portion of the positive effect internal integration has on external integration. Prior to this research, the internal integration → external integration relationship was largely attributed to the integrative mechanisms, in which researchers intuitively explained the positive relationship was based on organizational capabilities (e.g., high internal information sharing capabilities facilitate high external information sharing capabilities

due to established knowledge and infrastructure) (Zhao et al. 2011). Although the CB-SEM post hoc results support the rationalization that established knowledge and infrastructure are primarily responsible for a positive internal integration → external integration relationship (i.e., integrative mechanisms were captured via an achieved organizational state of integration) (Turkulainen and Ketokivi 2012), it was also concluded that intra-organizational focused behavioral phenomena are present and partly responsible for the internal integration → external integration relationship. Thus, the overarching supply chain integration theoretical implication is that there are behavioral phenomena that contribute to successfully achieving supply chain integration (i.e., besides SCO).

### *Managerial Implications*

The overarching managerial implication is that organizational identification and SCO can harmoniously exist within an organization. Although the results are consistent with the literature in that SCO requires overt managerial action to realize a supply chain management philosophy as a means to achieve favorable inter-organizational behaviors (Mentzer et al. 2001), organizational identification imposes two additional conditional requirements. First, in order for organizational identification to have a positive effect on supply chain integration, the post hoc analysis suggests that the internal-to-external implementation approach to supply chain integration (Stevens 1989) is required (i.e., achieved internal integration → organizational identification → achieved supplier integration). Second, for organizational identification to benefit firms both internally (i.e., greater motivation, improve job satisfaction, lower turnover, and favorable behavior) (Cardador and Pratt 2006) and externally (i.e., positively affect achieved supplier integration), focused effort must be taken (e.g., manager support and aligned rewards) (Fawcett and Magnan 2002; Pagell 2004) so external integration is viewed to benefit the firm and not threaten the current state (Brewer 1996).

## Dissertation Contributions

This dissertation originally identified a number of anticipated contributions resulting from this research (see Chapter 1). In general, these contributions included introducing organizational identification to the supply chain management literature; identifying an additional antecedent of organizational identification; evaluating a complex relational phenomenon that occurs within an organization and affects supply chain integration efforts; and examining the role of supply chain orientation with regards to supply chain integration. Moreover, these four overarching academic contributions were expected to serve managers with regards to supply chain integration efforts.

### *Theoretical Contributions*

This dissertation research is the first to introduce and examine the theoretical construct, organizational identification, in the supply chain management domain. Although the expectation was that organizational identification out-group behaviors would hinder successfully achieving supplier integration (i.e., Turner 1975; 1985), this dissertation contributes to the SIT literature by capturing and explaining inter-organizational behaviors (Ashforth et al. 2008). This dissertation goes beyond the common practice of adapting in-group behavior as an outcome of organizational identification (Ashforth et al. 2008); rather, this research extends the theoretical underpinnings of group identification to a supply chain context where both in-group and out-group social behaviors are adapted to explain organizational social behaviors.

This dissertation successfully identified achieved internal integration as an antecedent of organizational identification. Accordingly, this research contributes to SIT by extending current understanding of organizational identification (Ashforth, personal communication, December 14, 2012). Specifically, although SIT specifies that three conditions and several factors contribute to



organizational identification (Ashforth and Mael 1989), this research captures the process as well as the psychological state of organizational identification (i.e., three conditions, traditional group formation factors, and self-reinforcing behaviors) (Ashforth and Mael 1989; Dutton et al. 1994). This dissertation research also extends the current inventory and understanding of organizational identification antecedents by demonstrating that organizational identification can be an outcome of a business strategy and tactical actions (i.e., implementing and achieving internal integration).

This dissertation fully evaluated a complex relational phenomenon that occurs within the boundaries of an organization that and impacts organization's success in achieving supply chain integration. The first contribution is providing insight into complex factors that affect relational behaviors, which is the next step to better understand the supply chain integration phenomenon and advance supply chain management theories (Zhao et al. 2008; Defee et al. 2010). The second contribution is evaluating integration as an achieved organizational state, in which this is the first study to capture achieved internal and achieved external dimensions of supply chain integration. Specifically, this contribution emerges from the notion that theoretical development is dependent on testing and developing critical supply chain management constructs (Chen and Paulraj 2004).

This dissertation is the first research study to introduce and examine the facilitating role of SCO with regards to implementing and successfully achieving supply chain integration; thus contributing to much needed supply chain management theory development (e.g., Storey et al. 2006; Ketchen and Hult 2011). Specifically, although the supply chain management concept is predicated on both SCO and integration (Mentzer et al. 2001; Pagell 2004), extant research has yet to explicitly consider the implications of SCO with regards to supply chain integration efforts. The overarching theoretical contribution relating to the role of SCO is demonstrating that SCO is responsible for external integrative behaviors that are unattainable via integrative mechanisms.

### *Managerial Contributions*

The objective of this dissertation was to identify a source of relational behavioral barriers of supply chain integration that originates within a focal organization and to offer a solution that mitigates the source of the relational behavioral barriers of supply chain integration. Nonetheless, the empirical results indicate that this dissertation research has identified two distinct phenomena that occur within a focal organization that contribute to supply chain integration efforts. First, as described, this research serves managers by revealing the benefits of organizational identification are twofold. Considering that this research has also identified achieved internal integration as an antecedent of organizational identification, managers are better equipped to create organizational identification and to enjoy the internal organizational benefits of organizational identification as well as the external integration facilitator role of organizational identification. Second, although SCO has been recognized as an important supply chain management philosophy, this dissertation provides managers with additional evidence that SCO offers a number of benefits. Accordingly, managers now have more information and understanding when making SCO related decisions.

### Research Limitations

Unfortunately, no research is without limitations. This dissertation research has three key limitations. The first limitation is a survey research design that uses a single respondent to report on organizational conditions. Although survey respondents were targeted due to their knowledge of the current states of integration and the ability to represent the views of individuals within the organization (Narasimhan and Das 2001; Keh and Xie 2009), a single informant often introduces measurement errors (Phillips 1981). The inability to collect adequate secondary survey data also prevented a meaningful cross-validation assessment. Despite these limitations, a single informant

approach is an accepted standard for supply chain integration survey research due to historically low response rates (Chen et al. 2007; VanderVaart and vanDonk 2008). Moreover, the proactive steps that were taken likely contributed to avoiding common method bias (Podsakoff et al. 2003).

The second limitation is a survey research design that examines a dyadic relationship (i.e., achieved supplier integration) as a proxy for the external dimensions of supply chain integration. Justification for this research design is based on literature that specifies: dyads are an accepted measurement for supply chain management and integration research (Flynn et al. 2010; Soni and Kodali 2011); dyads are generalizable to a supply chain when examining relational phenomena (Autry and Griffis 2008); and buyer-supplier dyad relationships are fundamental to supply chain management (Chen and Paulraj 2004). Nevertheless, because supplier and customer integration entail different operating environments and perhaps behavioral considerations (Wong et al. 2011) and since a supply chain is generally represented as “a set of three or more entities” (Mentzer et al. 2001, p. 4), this dissertation research is somewhat limited by a dyadic survey research design.

The third limitation originates from the notion that all research methods impart strengths and weakness with regards to a research study (McGrath 1981). For example, while a strength of a survey research design is the ability to generalize to a population, weaknesses include realism and measurement precision (McGrath 1981). In a similar vein, despite having a target population that imposes a degree of causation (i.e., organizations implemented supply chain integration via an internal-to-external approach) and the suitability of SEM to predict and explain relationships among constructs of interest (Hair et al. 2011), the achieved internal integration → organizational identification causal relationship is theoretically supported rather than methodologically imposed (Hair et al. 2014). Although a theoretical causal relationship is sufficient to test mediation, such assessment ideally requires tangible cause-and-effect relationships (Hayes 2013; Hair et al. 2014).

## Future Research Directions

In order to overcome the single respondent and the dyadic relationship limitations of this dissertation research, a more inclusive/robust data collection and survey research design could be operationalized. Specifically, multiple-respondent observations could be collected within a focal organization as well as within corresponding customer and supplier organizations. This proposed future research opportunity would allow researchers to perform multiple-informant analytical techniques that are known to improve measurement reliability (O'Leary-Kelly and Flores 2002). Moreover, in capturing customer and supplier data, researchers can measure inter-rater agreement (e.g., evaluate answers between the focal organization and a corresponding supply chain partner) for both of the external integration dimensions (Wagner, Rau and Lindemann 2010). Finally, by collecting customer and supplier integration data, researchers may fully account for the effects of organizational identification given a supply chain integration context (e.g., Zhao et al. 2011).

In order to address the two methodology-related limitations of this dissertation research, future opportunities exist in developing an experimental research design as a means to improve measurement precision and to adequately capture causation (McGrath 1981; Spencer, Zanna and Fong 2005). Although the SIT and identification theoretical literature has historically performed experimental studies to examine the effects of identification and group behavior dynamics (e.g., Tajfel 1970; Worchel et al. 1998; DeCremer 2006), such an experimental research protocol is not available to examine the identification phenomenon within a supply chain context. Therefore, it is recommended that researchers consider modifying the "Beer Distribution Game" (e.g., Croson and Donohue 2009) to essentially simulate supply chain integration (i.e., internal integration and then external integration) for the manipulation group and assess organizational identification by collecting data via a post experiment questionnaire (e.g., Ellemers, Spears and Doosje 1997).

In spite of the research limitations, this dissertation remains to be the first study to assess organizational identification within a supply chain management context. Accordingly, a key area of future research directions relates to expanding current limited knowledge of the identification phenomenon in the supply chain management domain (e.g., Corsten et al. 2006; Min et al. 2009; Corsten et al. 2011). For example, an opportunity to extend the current study exists in testing and comparing benefits associated with organizational identification and a higher order identification focus (e.g. customer identification). This described research opportunity would provide insight as to whether organizational identification or customer identification is more beneficial to firms (i.e., Corsten et al. 2011). A second opportunity to extend this study relates to the premise of this dissertation research. Specifically, considering that individuals are more likely to identify with lower order identities than with higher order identities (Ashforth et al. 2008) and that achieving internal integration is a difficult accomplishment (Fawcett and Magnan 2002), researchers should examine departmental identification as a barrier to achieving internal integration.

A second overarching area of future research directions involves current understanding of the integration concept as well as barriers of supply chain integration. First, a substantial gap in the supply chain literature is an established measurement scale for the integration concept. Thus, an opportunity is to validate and extend the current achieved integration constructs (i.e., internal, supplier, and customer) and to develop a model that evaluates the effectiveness of the commonly cited integrative mechanisms (e.g., Leenders and Wierenga 2002). Second, in order to identify a phenomenon that arises within the boundaries of an organization that hinders external integration efforts, researchers should perform a case study approach and grounded theory methodology. In sum, this dissertation has identified two distinct facilitators of supply chain integration as well as revealed the numerous future research opportunities relating to supply chain integration.

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**APPENDIX A**  
**Integration Concept Definitions: Processes, Mechanisms, and Techniques**

<b>Internal Integration</b>	
Integration (Germain et al. 1994, p. 472)	“Integration refers to lateral links that coordinate differentiated subunits, reduce conflict and duplication, foster mutual adjustment, and coalesce subunits toward meeting overall organizational objectives.”
Integration (Lawrence and Lorsch 1967, p. 11)	“... the process of achieving unity of effort among the various subsystems in the accomplishment of the organization's task.”
Interdepartmental Integration (Stank et al. 1999, p. 12)	“Integration, melding together disparate areas, can be achieved through interaction/communication related activities, collaboration-related activities, or a combination of the two types of processes.”
<b>Supplier Integration</b>	
Supplier Integration (Eltantawy et al. 2009, p. 926)	“Actions, such as supplier participation in cross-functional teams, proactive support for product development processes, and early involvement in the design process are indicators of supplier integration...”
Supplier Integration (Lockström et al. 2010, p. 241)	“... a practice that links externally performed work of the supplier into a seamless congruency with internal work processes.”
Supplier Integration (Mollenkopf and Dapiran 2005, p. 65)	“Supplier integration refers to the competency of linking externally performed work into a seamless congruency with internal work processes.”
<b>Customer Integration</b>	
Customer Integration (Moeller 2008, p. 202)	“... combining customer resources (persons, possessions, nominal goods, and/or personal data) with the company resources, in order to transform customer resources.”
Customer Integration (Mollenkopf and Dapiran 2005, p. 65)	“Customer integration is the competency of building lasting distinctiveness with customers of choice.”
Customer Integration (Tollin 2002, p. 429)	“Captures a wide array of methods to import intelligence about customers’ values and behavior...”
<b>Supply Chain Integration</b>	
Supply Chain Integration (Cagliano et al. 2006, p. 283)	“Supply chain integration is strictly related to coordination mechanisms and in particular implies that business processes should be streamlined and interconnected both within and outside the company boundaries.”
Supply Chain Integration (Jayaram and Tan 2010, p. 262)	“Supply chain integration refers to coordination mechanisms in the form of business processes that should be streamlined and interconnected both within and outside company boundaries.”
Supply Chain Integration (Vijayasathy 2010, p. 489)	“... refers to the adoption and use of collaborative and coordinating structures, processes, technologies and practices among supply chain partners for building and maintaining a seamless conduit for the precise and timely flow of information, materials and finished goods.”

**APPENDIX B**  
**Integration Concept Definitions: Achieved Organizational State of Integration**

<b>Internal Integration</b>	
Organizational Integration (Barki and Pinsonneault 2005, p. 166)	"... the extent to which distinct and interdependent organizational components constitute a unified whole. In this definition, the term component refers to organizational units, departments, or partners and includes the business processes, people, and technology involved."
Interdepartmental Integration (Chen et al. 2010, p. 1151)	"Integration refers to a state of shared vision, mutual goal commitments, and collaborative behaviors."
Integration (O'Leary-Kelly and Flores 2002, p. 226)	"... integration refers to the extent to which separate parties work together in a cooperative manner to arrive at mutually acceptable outcomes. Accordingly, this definition encompasses constructs pertaining to the degree of cooperation, coordination, interaction, and collaboration."
<b>Supplier Integration</b>	
Supplier Integration (Das et al. 2006, p. 564)	"a state of syncreticism among the supplier, purchasing and manufacturing constituents of an organization."
Supplier Integration (Schoenherr and Swink 2012, p. 100)	"Supplier integration involves coordination and information sharing activities with key suppliers that provide the firm with insights into suppliers' processes, capabilities and constraints..."
Supplier Integration (Wong et al. 2011, p. 605)	"Supplier integration involves strategic joint collaboration between a focal firm and its suppliers in managing cross-firm business processes, including information sharing, strategic partnership, collaboration in planning, joint product development, and so forth."
<b>Customer Integration</b>	
Customer Integration (Schoenherr and Swink 2012, p. 100)	"Customer integration refers to close collaboration and information sharing activities with key customers that provide the firm with strategic insights into market expectations and opportunities..."
Customer Integration (Wong et al. 2011, p. 605)	"Customer integration involves strategic information sharing and collaboration between a focal firm and its customers which aim to improve visibility and enable joint planning."
Customer Integration (Zailani and Rajagopal 2005, p. 383)	"... company working closely with customers and viewing the latter as an important component of supply chain."
<b>Supply Chain Integration</b>	
Supply Chain Integration (Fawcett and Magnan, p. 355)	"True integration - where objectives are aligned, communication is open and candid, resources are pooled, and risks and rewards are shared - remains rare."
Supply Chain Integration (Rich and Hines 1997, p. 213)	"This organizational state involves the externalization of the alignment process and the integration of the supply base with the demands of the consumer in a transparent system of materials and information exchange."
Supply Chain Integration (Zhao et al. 2008, p. 374)	"SCI is the degree to which an organization strategically collaborates with its SC partners and manages intra- and inter-organization processes to achieve effective and efficient flows of products, services, information, money and decisions, with the objective of providing maximum value to its customers."

APPENDIX C  
Institutional Review Board (IRB) Approval Letter

Georgia Southern University Office of Research Services & Sponsored Programs		
<b>Institutional Review Board (IRB)</b>		
Phone: 912-478-0843		Veazey Hall 2021
Fax: 912-478-0719	IRB@GeorgiaSouthern.edu	P.O. Box 8005 Statesboro, GA 30460

**To:** Jessica L. Robinson  
Dr. Karl Manrodt  
Dr. Paige Rutner  
Dr. Monique Murfield  
Dr. Christopher Boone

**cc:** Charles E. Patterson  
Vice President for Research and Dean of the Graduate College

**From:** Office of Research Services and Sponsored Programs  
Administrative Support Office for Research Oversight Committees  
(IACUC/IBC/IRB)

**Initial Approval Date:** 10/15/13

**Subject:** Status of Application for Approval to Utilize Human Subjects in Research –  
**Exempt Process**

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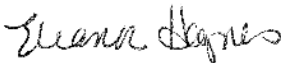
After a review of your proposed research project numbered H14122 and titled **“Organizational Identification and Supply Chain Orientation: Examining a Supply Chain Integration Paradox.”** it appears that your research involves activities that do not require full approval by the Institutional Review Board (IRB) according to federal guidelines.

According to the Code of Federal Regulations Title 45 Part 46, your research protocol is determined to be exempt from full review under the following exemption category(s):

- B2 Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (I) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (II) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

*Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that your research, as submitted, is exempt from IRB approval. No further action or IRB oversight is required, as long as the project remains the same. If you alter the project, it is your responsibility to notify the IRB and acquire a new determination of exemption. Because this project was determined to be exempt from further IRB oversight, this project does not require an expiration date.*

Sincerely,



Eleanor Haynes  
Compliance Officer



# APPENDIX D

## Survey Instrument (page 1)

 **GEORGIA SOUTHERN UNIVERSITY**

Thank you for participating in this survey. The purpose of this dissertation research is to learn about organizational and supply chain conditions and how they influence supply chain integration.

Your answers will be kept completely confidential and will be used for scientific research only. No individual or organization will be identified and all data will be used in the aggregate. None of the data collected in this study will be shared with or sold to any third party. Participation is strictly voluntary and you may stop answering questions at any time.

The questionnaire should take approximately 5-7 minutes. Please try to complete the survey in one sitting and answer the questions to the best of your ability. Participation in this questionnaire does not require you to provide information about your experiences, but rather to answer questions based on an organizational unit or analysis. Continued involvement indicates your consent to participate in this survey.

Thank you again for your willingness to participate in this research. If you have any questions about your rights as a research participant, you may contact the Office of Research at Georgia Southern University at (912) 470-3465. This project has been reviewed and approved under GSU IRB under tracking number 141432.

Progress bar: 0% to 100%

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 **GEORGIA SOUTHERN UNIVERSITY**

This survey involves questions regarding daily operating conditions within your organization and across supply chain members. Do you have operational knowledge of both internal and external organizational conditions?

Yes  
 No

Progress bar: 0% to 100%

<< >>

 **GEORGIA SOUTHERN UNIVERSITY**

Do you regularly interact with your organization's frontline supervisors and with at least one direct supplier's frontline supervisors and/or operations managers?

Yes  
 No

Progress bar: 0% to 100%

>>

 **GEORGIA SOUTHERN UNIVERSITY**

Organizations may integrate internally (across departments) or externally (with a supplier or customer). Examples of integration implementation techniques are aligning information, measurement, and reward systems; creating cross-functional teams; and establishing informal and collaborative communication policies. Organizations that integrate internally and externally with both a supplier and a customer (three sequential supply chain organizations) are said to be engaged in supply chain integration.

Is your organization engaged in supply chain integration?

Yes  
 No

Progress bar: 0% to 100%

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 **GEORGIA SOUTHERN UNIVERSITY**

An internal-to-external approach to implementing supply chain integration is when an organization has integrated internally first and then integrated with external supply chain members.

Has your organization executed an internal-to-external approach to implement supply chain integration?

Yes  
 No

Progress bar: 0% to 100%

>>

## APPENDIX D Survey Instrument (page 2)

**GEORGIA SOUTHERN UNIVERSITY**

The questions below relate to internal integration among the functional departments within your organization (e.g., logistics, marketing, and production). Please indicate the degree to which you agree or disagree with the following statements.

	INTERNAL ORGANIZATIONAL INTEGRATION						
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The functions in this organization are well integrated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The functions in this organization cooperate well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Functional problems are solved early in this organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This organization's functions coordinate their activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The organization's functions work interactively with each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The functions in this organization collaborate well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Next Question >>

**GEORGIA SOUTHERN UNIVERSITY**

The questions below relate to the supply chain condition (e.g., your organization, suppliers, customers, and service providers). Please indicate the degree to which you agree or disagree with the following statements.

	SUPPLY CHAIN CONDITIONS						
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
There is a collaborative agreement on process evaluation with other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is an agreement on collaborative goals with other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are joint groups in place with other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This organization is aware that its decisions may affect other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This organization is willing to trust other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This organization has long-term relationships with other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is an equal distribution of power among all supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If you have not had this item, please mark Strongly Disagree.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is an equal distribution of risks and benefits among all supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a mutual dependency between this organization and other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This organization exchanges stock level information with other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This organization exchanges forecasting information with other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This organization exchanges product development information with other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The organization's corporate culture is similar to other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This organization's corporate decision making is similar to other supply chain members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Next Question << >>

**GEORGIA SOUTHERN UNIVERSITY**

The questions below relate to your organization's perceptions. Please indicate the degree to which you agree or disagree with the following statements about how the majority of your employees feel about their own organization.

	ORGANIZATIONAL CONDITIONS						
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
When someone criticizes this organization, it feels like a personal insult to the employees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees are very interested in what others think about this organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When talking about this organization, employees usually say "we" rather than "they".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This organization's successes are the employees' successes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When someone praises this organization, it feels like a personal compliment to the employees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If a story in the media criticized this organization, it would be embarrassing to the employees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Next Question >>

## APPENDIX D Survey Instrument (page 3)

**GEORGIA SOUTHERN UNIVERSITY**

Please take a moment to think about an integrated supplier that you are the most familiar. The questions below relate to supplier integration among the functional departments (e.g., logistics, marketing, and production). Please indicate the degree to which you agree or disagree with the following statements.

SUPPLIER INTEGRATION

The functions between the organizations are well integrated.	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The functions between the organizations are well integrated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The functions between the organizations cooperate well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Functional problems are solved easily between the organizations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The organization's functions coordinate their activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The organization's functions work interdependently with each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The functions between the organizations collaborate well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**GEORGIA SOUTHERN UNIVERSITY**

Please provide your formal job title.

Please indicate approximately how long you have been employed with your current employer.

Less than 1 year  
 1 - 3 years  
 3 - 5 years  
 5 - 7 years  
 Greater than 7 years

Voluntary and Anonymous: Please provide the email address of a colleague with a similar job title that would be interested in completing this survey:

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**GEORGIA SOUTHERN UNIVERSITY**

Which term best describes your organization's position in the supply chain?

Retailer  
 Wholesaler or distributor  
 Manufacturer  
 Supplier to a manufacturer  
 JPL or cPL  
 Other

Which term best describes your organization's industry?

Automotive  
 Apparel/textiles  
 Electronics  
 Chemicals/plastics  
 Medical/pharmaceutical  
 Consumer packaged goods  
 Industrial parts  
 Other

What is the total number of employees in your organization?

1 - 49  
 50 - 249  
 250 - 499  
 500 - 999  
 1,000 - 2,500  
 Over 2,500

What is your organization's approximate annual sales revenue?

Less than \$1 million  
 \$1 - \$50 million  
 \$51 - \$500 million  
 \$501 million - \$1 billion  
 Greater than \$1 billion

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## APPENDIX E

### Scale Measurement Items

---

**Achieved Internal Integration** (Adapted from Turkulainen and Kotokivi 2012)

---

Scale response anchors (Vagias 2006): 1=Strongly disagree; 2=Disagree; 3=Somewhat disagree; 4=Neither agree nor disagree; 5=Somewhat agree; 6=Agree; and 7=Strongly agree.

- II1) The functional departments in this organization are well integrated.
- II2) The functions in this organization cooperate well.
- II3) Functional problems are solved easily in this organization.
- II4) This organization's functions coordinate their activities.
- II5) This organization's functions work interactively with each other.
- II6) The functions in this organization collaborate well.

---

**Achieved Supplier Integration** (Gimenez 2006; Adapted from Turkulainen and Kotokivi 2012)

---

Scale response anchors (Vagias 2006): 1=Strongly disagree; 2=Disagree; 3=Somewhat disagree; 4=Neither agree nor disagree; 5=Somewhat agree; 6=Agree; and 7=Strongly agree.

- SI1) The functions between the organizations are well integrated.
- SI2) The functions between the organizations cooperate well.
- SI3) Functional problems are solved easily between the organizations.
- SI4) The organization's functions coordinate their activities.
- SI5) The organization's functions work interactively with each other.
- SI6) The functions between the organizations collaborate well.

---

**Organizational Identification** (Adapted from Mael 1988; Corsten et al. 2011)

---

Scale response anchors (Vagias 2006): 1=Strongly disagree; 2=Disagree; 3=Somewhat disagree; 4=Neither agree nor disagree; 5=Somewhat agree; 6=Agree; and 7=Strongly agree.

- OI1) When someone criticizes this organization, it feels like a personal insult to the employees.
- OI2) Employees are very interested in what others think about this organization.
- OI3) When talking about this organization, employees usually say "we" rather than "they."
- OI4) This organization's successes are the employee's successes.
- OI5) When someone praises this organization, it feels like a personal compliment to the employees.
- OI6) If a story in the media criticized this organization, it would be embarrassing to the employees.

---

**Supply Chain Orientation** (Adapted from Kotzab et al. 2011)

---

Scale response anchors (Vagias 2006): 1=Strongly disagree; 2=Disagree; 3=Somewhat disagree; 4=Neither agree nor disagree; 5=Somewhat agree; 6=Agree; and 7=Strongly agree.

- SC1) There is a collaborative agreement on process evaluation with other supply chain members.
  - SC2) There is an agreement on collaborative goals with other supply chain members.
  - SC3) There are project groups in place with other supply chain members.
  - SC4) This organization is aware that its decisions may affect other supply chain members.
  - SC5) This organization is willing to trust other supply chain members.
  - SC6) This organization has long-term relationships with other supply chain members.
  - SC7) There is an equal distribution of power among all supply chain members.
  - SC8) There is an equal distribution of risks and benefits among all supply chain members.
  - SC9) There is a mutual dependency between this organization and other supply chain members.
  - SC10) This organization exchanges stock level information with other supply chain members.
  - SC11) This organization exchanges forecasting information with other supply chain members.
  - SC12) This organization exchanges product development information with other supply chain members.
  - SC13) This organization's corporate culture is similar to other supply chain members.
  - SC14) This organization's corporate decision making is similar to other supply chain members.
-

APPENDIX F  
Click-Through Response Rate

Total number of panel targeted participants (B2B managers)	6,972
Total number removed due to target respondent questions	196
Target respondent elimination question 1 (internal/external knowledge)	149
Target respondent elimination question 2 (internal/supplier interaction)	47
Total number removed due to target population questions	160
Target population elimination question 1 (not engaged in SC integration)	117
Target population elimination question 2 (external-to-internal approach)	43
Total number removed due to failing the validation question	45
Total number removed due to not completing the survey	54
Final click-through rate	33.28%
Total number of retained surveys after the screening process	227
Total number of click-through survey respondents	682

**APPENDIX G**  
**Cross-Validation Assessment**

<b>One-Sample Test</b>					
Measurement Item	Test Value = 0				
	Mean	Standard Deviation	Significance (2-tailed)	95% Confidence Interval of the Difference	
				Lower	Upper
<b>Achieved Internal Integration</b>					
II1	6.0	1.414	0.105	-6.71	18.71
II2	6.5	0.707	0.049	0.15	12.85
II3	5.5	2.121	0.170	-13.56	24.56
II4	6.0	1.414	0.105	-6.71	18.71
II5	6.0	1.414	0.105	-6.71	18.71
II6	6.0	1.414	0.105	-6.71	18.71
<b>Supply Chain Orientation</b>					
SC1	5.5	0.707	0.058	-0.85	11.85
SC2	6.0	1.414	0.105	-6.71	18.71
SC3	6.0	1.414	0.105	-6.71	18.71
SC4	6.5	0.707	0.049	0.15	12.85
SC5	6.5	0.707	0.049	0.15	12.85
SC6	6.0	1.414	0.105	-6.71	18.71
SC7	6.0	1.414	0.105	-6.71	18.71
SC8	1.0	0.00*	n.a.	n.a.	n.a.
SC9	5.5	0.707	0.058	-0.85	11.85
SC10	6.0	0.00*	n.a.	n.a.	n.a.
SC11	5.0	2.828	0.242	-20.41	30.41
SC12	5.0	2.828	0.242	-20.41	30.41
SC13	5.5	2.121	0.170	-13.56	24.56
SC14	6.0	1.414	0.105	-6.71	18.71
SC15	6.0	1.414	0.105	-6.71	18.71
<b>Organizational Identification</b>					
OI1	6.5	0.707	0.049	0.15	12.85
OI2	6.5	0.707	0.049	0.15	12.85
OI3	6.0	0.00*	n.a.	n.a.	n.a.
OI4	7.0	0.00*	n.a.	n.a.	n.a.
OI5	7.0	0.00*	n.a.	n.a.	n.a.
OI6	6.0	0.00*	n.a.	n.a.	n.a.
<b>Achieved Supplier Integration</b>					
SI1	6.5	0.707	0.049	0.15	12.85
SI2	6.5	0.707	0.049	0.15	12.85
SI3	6.0	1.414	0.105	-6.71	18.71
SI4	6.0	1.414	0.105	-6.71	18.71
SI5	6.0	1.414	0.105	-6.71	18.71
SI6	6.0	1.414	0.105	-6.71	18.71

\* t cannot be computed because the standard deviation is 0.

## APPENDIX H Non-Response Bias Assessment

### Achieved Internal Integration

ANOVA						
Item		Sum of Squares	df	Mean Square	F	Sig.
II1	Between Groups	3.59	2	1.79	1.10	0.33
	Within Groups	364.20	224	1.63		
	Total	367.79	226			
II2	Between Groups	10.62	2	5.31	3.51	0.03
	Within Groups	338.90	224	1.51		
	Total	349.52	226			
II3	Between Groups	5.67	2	2.83	1.48	0.23
	Within Groups	428.47	224	1.91		
	Total	434.14	226			
II4	Between Groups	6.36	2	3.18	1.89	0.15
	Within Groups	376.53	224	1.68		
	Total	382.89	226			
II5	Between Groups	3.62	2	1.81	1.18	0.31
	Within Groups	343.37	224	1.53		
	Total	346.99	226			
II6	Between Groups	4.71	2	2.35	1.46	0.24
	Within Groups	362.31	224	1.62		
	Total	367.02	226			

### Organizational Identification

ANOVA						
Item		Sum of Squares	df	Mean Square	F	Sig.
OI1	Between Groups	1.64	2	0.82	0.38	0.69
	Within Groups	488.23	224	2.18		
	Total	489.87	226			
OI2	Between Groups	1.74	2	0.87	0.60	0.55
	Within Groups	322.88	224	1.44		
	Total	324.62	226			
OI3	Between Groups	9.15	2	4.58	2.45	0.09
	Within Groups	418.05	224	1.87		
	Total	427.20	226			
OI4	Between Groups	7.90	2	3.95	2.09	0.13
	Within Groups	423.35	224	1.89		
	Total	431.24	226			
OI5	Between Groups	3.02	2	1.51	1.02	0.36
	Within Groups	330.61	224	1.48		
	Total	333.63	226			
OI6	Between Groups	11.10	2	5.55	3.35	0.04
	Within Groups	371.56	224	1.66		
	Total	382.66	226			

### Achieved Supplier Integration

ANOVA						
Item		Sum of Squares	df	Mean Square	F	Sig.
SI1	Between Groups	0.95	2	0.48	0.33	0.72
	Within Groups	320.51	224	1.43		
	Total	321.46	226			
SI2	Between Groups	0.73	2	0.37	0.25	0.78
	Within Groups	326.78	224	1.46		
	Total	327.52	226			
SI3	Between Groups	0.32	2	0.16	0.09	0.91
	Within Groups	395.93	224	1.77		
	Total	396.25	226			
SI4	Between Groups	1.15	2	0.58	0.40	0.67
	Within Groups	324.58	224	1.45		
	Total	325.73	226			
SI5	Between Groups	0.05	2	0.02	0.02	0.99
	Within Groups	337.11	224	1.51		
	Total	337.15	226			
SI6	Between Groups	0.32	2	0.16	0.11	0.90
	Within Groups	336.65	224	1.50		
	Total	336.97	226			

### Supply Chain Orientation

ANOVA						
Item		Sum of Squares	df	Mean Square	F	Sig.
SC1	Between Groups	2.55	2	1.27	1.02	0.36
	Within Groups	280.14	224	1.25		
	Total	282.69	226			
SC2	Between Groups	1.90	2	0.95	0.76	0.47
	Within Groups	279.78	224	1.25		
	Total	281.67	226			
SC3	Between Groups	0.74	2	0.37	0.20	0.82
	Within Groups	412.02	224	1.84		
	Total	412.77	226			
SC4	Between Groups	0.66	2	0.33	0.26	0.77
	Within Groups	283.86	224	1.27		
	Total	284.52	226			
SC5	Between Groups	7.90	2	3.95	2.76	0.07
	Within Groups	320.73	224	1.43		
	Total	328.63	226			
SC6	Between Groups	3.16	2	1.58	1.38	0.25
	Within Groups	256.35	224	1.14		
	Total	259.52	226			
SC7	Between Groups	6.59	2	3.30	1.63	0.20
	Within Groups	453.04	224	2.02		
	Total	459.63	226			
SC8	Between Groups	7.96	2	3.98	2.06	0.13
	Within Groups	433.12	224	1.93		
	Total	441.08	226			
SC9	Between Groups	1.15	2	0.58	0.42	0.66
	Within Groups	307.07	224	1.37		
	Total	308.22	226			
SC10	Between Groups	1.42	2	0.71	0.28	0.75
	Within Groups	564.76	224	2.52		
	Total	566.19	226			
SC11	Between Groups	0.29	2	0.14	0.07	0.93
	Within Groups	457.96	224	2.04		
	Total	458.25	226			
SC12	Between Groups	6.19	2	3.09	1.47	0.23
	Within Groups	471.08	224	2.10		
	Total	477.27	226			
SC13	Between Groups	0.64	2	0.32	0.16	0.85
	Within Groups	439.32	224	1.96		
	Total	439.96	226			
SC14	Between Groups	1.39	2	0.69	0.35	0.71
	Within Groups	443.49	224	1.98		
	Total	444.88	226			

Multiple Comparisons							
Dependent Variable	(I) GROUP	(J) GROUP	Mean Difference	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
II2	0	1	0.74	0.33	0.07	-0.05	1.52
		2	0.40	0.35	0.49	-0.42	1.23
	1	0	-0.74	0.33	0.07	-1.52	0.05
		2	-0.33	0.18	0.16	-0.76	0.10
	2	0	-0.40	0.35	0.49	-1.23	0.42
		1	0.33	0.18	0.16	-0.10	0.76
OI6	0	1	0.07	0.35	0.98	-0.76	0.89
		2	-0.42	0.37	0.49	-1.29	0.45
	1	0	-0.07	0.35	0.98	-0.89	0.76
		2	-0.49*	0.19	0.03	-0.94	-0.04
	2	0	0.42	0.37	0.49	-0.45	1.29
		1	0.49*	0.19	0.03	0.04	0.94
Tukey Honest Significant Difference							
GROUP	N	Subset for alpha (0.05)		GROUP	N	Subset for alpha (0.05)	
		1	2			1	2
1	145	5.13		1	145	5.33	
2	67	5.46	5.46	0	15	5.40	
0	15		5.87	2	67	5.82	
Sig.		0.51	0.37	Sig.		0.26	

APPENDIX I  
Linear Extrapolation Method (R<sup>2</sup> Values)

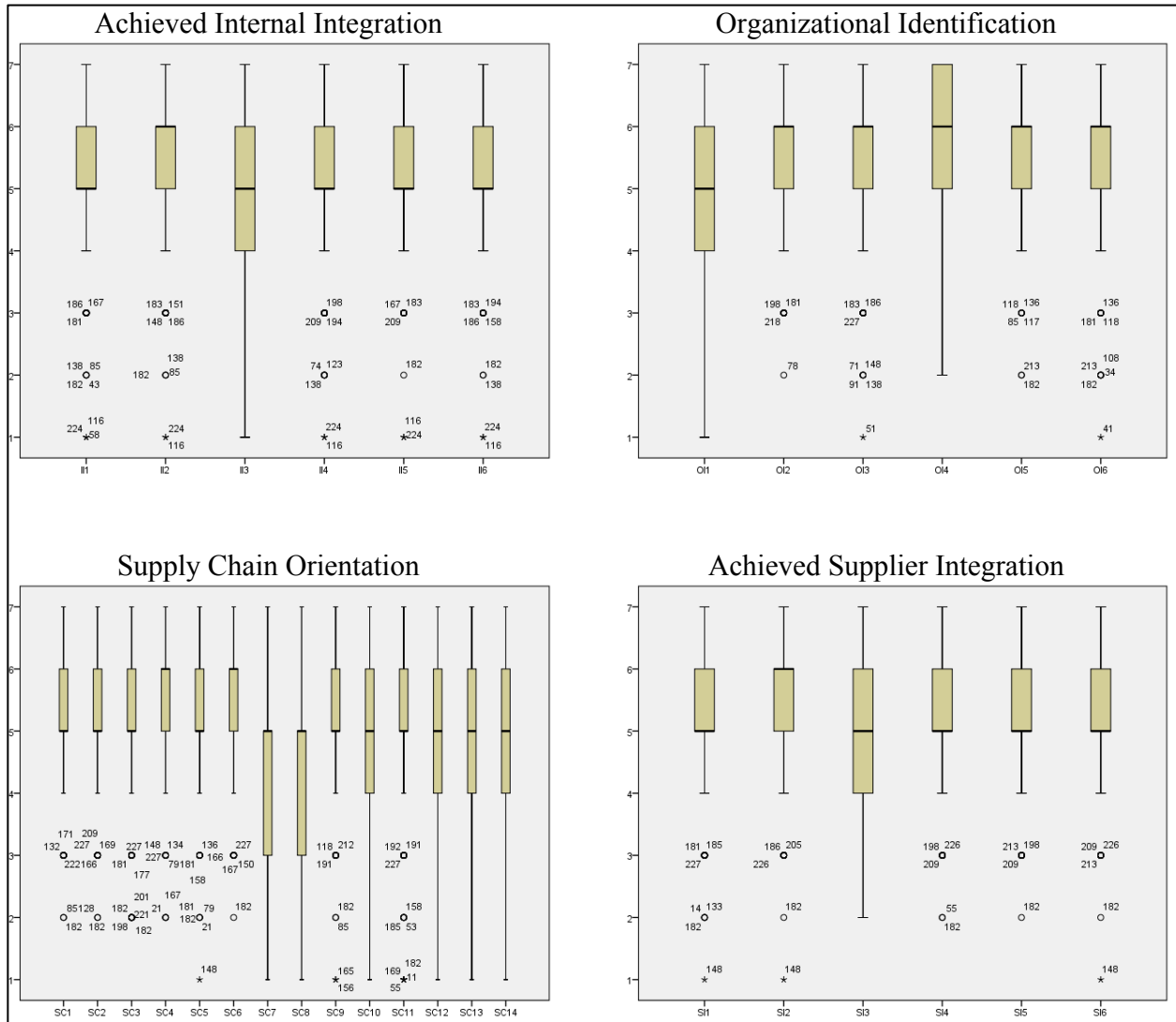
Construct Item	R <sup>2</sup>
<b>Achieved Internal Integration</b>	
II1	0.037%
II2	0.098%
II3	0.274%
II4	0.163%
II5	0.328%
II6	0.081%
<b>Supply Chain Orientation</b>	
SC1	0.151%
SC2	0.657%
SC3	0.121%
SC4	0.019%
SC5	0.527%
SC6	0.022%
SC7	0.029%
SC8	0.355%
SC9	0.369%
SC10	0.220%
SC11	0.042%
SC12	1.112%
SC13	0.136%
SC14	0.293%
<b>Organizational Identification</b>	
OI1	0.087%
OI2	0.172%
OI3	0.075%
OI4	0.174%
OI5	0.050%
OI6	1.280%
<b>Achieved Supplier Integration</b>	
SI1	0.139%
SI2	0.003%
SI3	0.076%
SI4	0.285%
SI5	0.000%
SI6	0.004%

First wave (n = 15); second wave (n = 145); third wave (n = 67)





## APPENDIX K Normal Distribution Boxplots

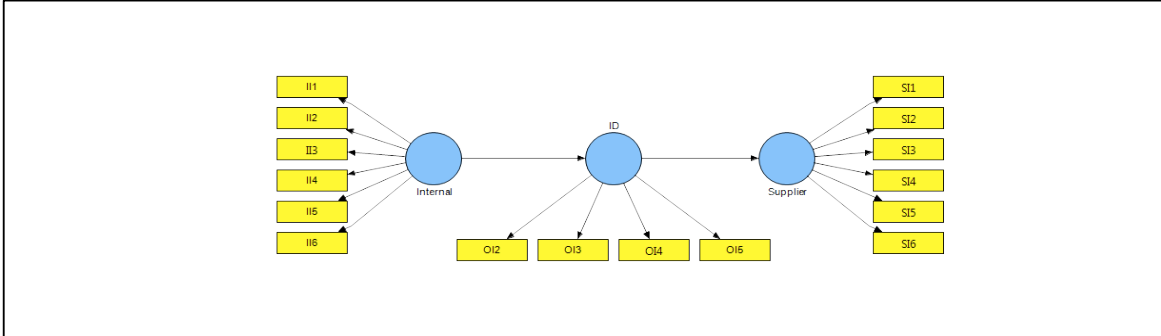


APPENDIX L  
Data Distribution (Skewness and Kurtosis)

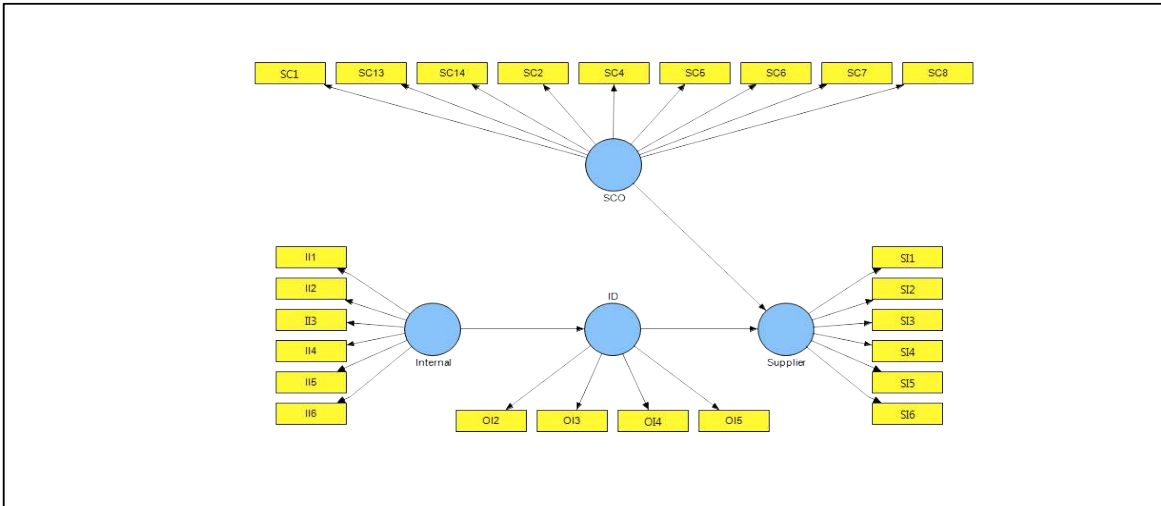
Construct	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
Item	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
<b>Achieved Internal Integration</b>									
II1	219	3	7	5.25	1.04	-0.67	0.16	0.07	0.33
II2	219	3	7	5.41	1.01	-0.82	0.16	0.65	0.33
II3	219	1	7	4.84	1.28	-0.60	0.16	0.02	0.33
II4	219	2	7	5.14	1.14	-0.59	0.16	-0.17	0.33
II5	219	3	7	5.35	1.04	-0.59	0.16	0.05	0.33
II6	219	3	7	5.26	1.05	-0.51	0.16	-0.15	0.33
<b>Supply Chain Orientation</b>									
SC1	219	3	7	5.34	0.96	-0.70	0.16	0.41	0.33
SC2	219	3	7	5.33	0.97	-0.62	0.16	0.17	0.33
SC3	219	2	7	5.22	1.24	-0.65	0.16	0.00	0.33
SC4	219	3	7	5.70	0.93	-0.63	0.16	0.43	0.33
SC5	219	3	7	5.34	1.01	-0.49	0.16	-0.05	0.33
SC6	219	3	7	5.76	0.98	-0.77	0.16	0.57	0.33
SC7	219	1	7	4.36	1.39	-0.07	0.16	-0.85	0.33
SC8	219	1	7	4.46	1.36	-0.33	0.16	-0.82	0.33
SC9	219	3	7	5.35	1.08	-0.52	0.16	-0.21	0.33
SC10	219	1	7	4.78	1.56	-0.77	0.16	0.06	0.33
SC11	219	1	7	5.19	1.31	-0.82	0.16	0.28	0.33
SC12	219	1	7	4.87	1.37	-0.46	0.16	-0.49	0.33
SC13	219	1	7	4.79	1.33	-0.55	0.16	-0.13	0.33
SC14	219	1	7	4.76	1.32	-0.74	0.16	0.31	0.33
<b>Organizational Identification</b>									
OI1	219	1	7	4.94	1.44	-0.69	0.16	-0.22	0.33
OI2	219	3	7	5.62	1.05	-0.70	0.16	0.09	0.33
OI3	219	3	7	5.49	1.13	-0.81	0.16	0.01	0.33
OI4	219	2	7	5.74	1.12	-0.91	0.16	0.60	0.33
OI5	219	3	7	5.82	0.94	-0.81	0.16	0.60	0.33
OI6	219	2	7	5.56	1.16	-0.72	0.16	-0.07	0.33
<b>Achieved Supplier Integration</b>									
SI1	219	2	7	5.21	1.03	-0.60	0.16	0.26	0.33
SI2	219	3	7	5.40	1.00	-0.61	0.16	0.23	0.33
SI3	219	2	7	4.98	1.20	-0.40	0.16	-0.53	0.33
SI4	219	3	7	5.16	1.04	-0.41	0.16	-0.23	0.33
SI5	219	3	7	5.34	1.05	-0.64	0.16	0.02	0.33
SI6	219	3	7	5.26	1.04	-0.61	0.16	-0.07	0.33

## APPENDIX M Structural Models (PLS-SEM)

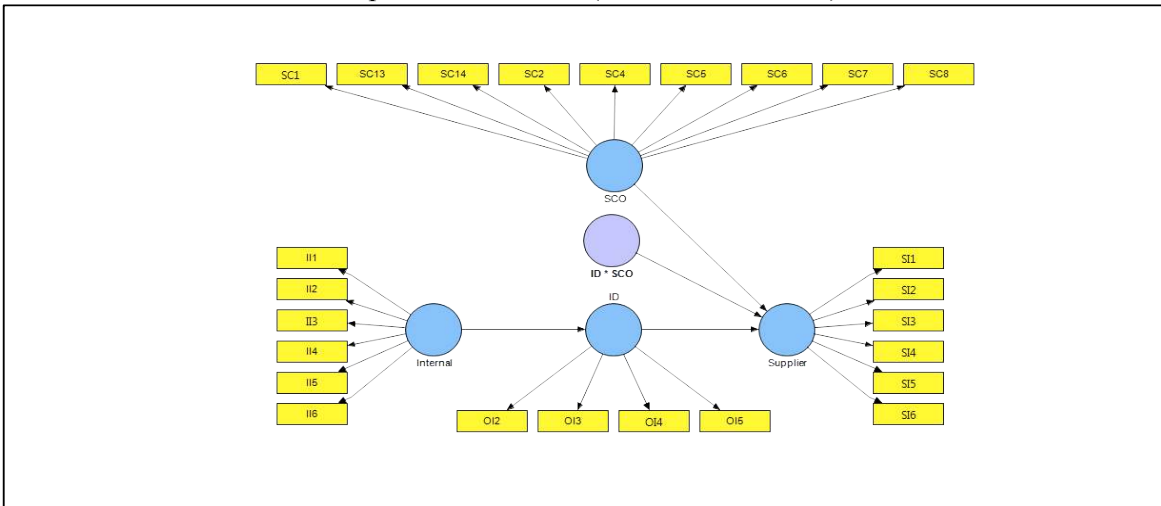
Main Effects Model (Structural Model A)



Direct Effects Model (Structural Model B)



Simple Effects Model (Structural Model C)



APPENDIX N  
Measurement Model Evaluation Results (CB-SEM)

Construct	Item Indicators	Standardized Loadings	Cronbach's Alpha	Fornell-Larcker Criterion		
				II	OI	SI
Achieved Internal Integration (II)	II1	0.807	0.930	0.699	0.291	0.412
	II2	0.826				
	II3	0.803				
	II4	0.800				
	II5	0.873				
	II6	0.903				
Organizational Identification (OI)	OI2	0.765	0.841	0.539	0.578	0.394
	OI3	0.675				
	OI4	0.812				
	OI5	0.783				
Achieved Supplier Integration (SI)	SI1	0.816	0.932	0.642	0.628	0.701
	SI2	0.824				
	SI3	0.808				
	SI4	0.812				
	SI5	0.876				
	SI6	0.883				

Note: AVE values are presented on the diagonal, correlations are below the diagonal, and squared correlations are above the diagonal.

APPENDIX O  
Mediation Structural Equation Model

