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# AN EXAMINATION OF INTERORGANIZATIONAL RELATIONSHIP MAGNITUDE AND ITS ROLE IN DETERMINING RELATIONSHIP VALUE

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Susan L. Golicic
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## DEDICATION

This dissertation is dedicated to my niece, Phoebe Quinn Golicic.

Always believe that you can accomplish anything.

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## ABSTRACT

As the business environment becomes more complex, organizations within a supply chain realize that in many instances they can benefit from closer, long-term relationships. However, researchers in this area agree that there is no one relationship that is appropriate or necessary for all situations. Since there exists a wide range of relationships within a supply chain, businesses need to manage the development and maintenance of each relationship in their "portfolios." This entails recognizing the motivating factors that drive companies to a particular relationship, determining the appropriate amount of resources that will be dedicated based on the targeted relationship, and measuring the benefits to ensure they are achieving value from the relationship.

Although there is a great deal of research on interorganizational relationships in the marketing and logistics literature, little empirical research has been conducted on the concept of relationship magnitude (the extent or degree of closeness or strength of the relationship) and none has addressed how to determine and select the "optimal" relationship magnitude for particular business situations. This dissertation strives to fill this gap by understanding and explaining the phenomenon of relationship magnitude and its relationships with situational drivers (i.e., how companies determine the level of intensity), the type of relationship chosen, and the value of the relationship (i.e., how the level of intensity affects the evaluation of value).

Using the extant literature along with qualitative interviews, a theoretical model was constructed and then tested through a mail survey sent to 588 customers of transportation providers. The survey data were analyzed using structural equation

modeling to simultaneously test the five hypotheses and the contention that relationship magnitude is a second order construct comprised of the dimensions of trust, commitment and dependence. The fit of the second order model was good (RMSEA of .073, CFI of .905, CMIN of 2.715) and all hypothesized paths were significant, thus supporting the theory of this dissertation.

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# CHAPTER 1 – INTRODUCTION

A large part of managing supply chains consists of managing multiple relationships among the member organizations (Cooper et al. 1997; Mentzer et. al. 2001a and b). Connections among these organizations range from single transactions to complex interdependent relationships. As the business environment becomes more complex, organizations within supply chains realize that in many instances they can benefit from long-term relationships (Ganesan 1994). Building interdependent or closer relationships with customers is thought to increase customer satisfaction (Berry and Parasuraman 1991). Day (2000) even goes so far as to say that committed relationships are among the most durable of advantages because of their inherent barriers to competition. Thus, many firms are moving away from adversarial exchanges toward closer and more long-term relationships (Holmlund and Kock 1993; Kalwani and Narayandas 1995).

While firms are developing closer relationships, they do not structure all their relationships this way. Analogous to maintaining a portfolio of different investments, a firm is involved in a wide range of different relationships with suppliers and customers. This portfolio consists of various types of relationships that span the continuum of magnitude – some distant, transactional relationships and others extremely close or collaborative, with most relationships somewhere in between the extremes. Firms choose different relationship structures based on the situation with the other firm, e.g., the importance of the other firm, history of the relationship, etc. These different relationships

require different resource inputs based on their level of magnitude. According to social exchange theory, the amount of resources needed to build and maintain closer relationships is higher, but the benefits from them are expected to be higher as well (Lambe, Wittmann, and Spekman (2001). However, closer relationships do not necessarily mean higher performance in the eyes of the customer (Cannon and Perreault 1999).

Relationships deal with both social and economic inputs and outputs; therefore measuring the value from them is often subjective. Many companies bypass measuring value altogether (Keebler et al. 1999). These companies may not know if they are obtaining the appropriate level of value. They could perhaps get more value from a different relationship structure. It is difficult to rectify this if companies do not measure value and are therefore not aware of it. The purpose of this dissertation is to examine the construct of relationship magnitude and to understand its role in relationship structure and in measuring the value of the different relationships. The main objective is to help companies determine how to recognize and measure the value of different relationship intensities and predict the optimal relationship magnitude for a given business situation.

The remainder of this chapter examines the justification for this research and its specific goals. Existing literature on the theories related to interorganizational relationships are reviewed in the following section to determine the gaps that this research attempts to fill. The conceptual framework surrounding relationship magnitude and value is presented in the third section. Research objectives are then discussed followed by contributions expected from the dissertation. The chapter concludes with a description of the organization of the entire dissertation.

## THEORETICAL JUSTIFICATION

The business press has advocated the need for firms to build and manage closer, longer-term relationships with suppliers and customers. However, in their study on buyer-seller relationships, Cannon and Perreault found that some buyer firms do not want or need close ties with all of their suppliers (1999). Their results show that different types of interorganizational relationships dominate in different situations and that each relationship requires different types and degrees of investment and produces different outcomes.

Other authors agree that there is no one relationship that is appropriate or necessary for all situations (Day 2000; Lambert, Emmelhainz and Gardner 1996; Mentzer, Min, and Zacharia 2000). One reason for this is that it is not possible to pursue certain types of relationships, such as partnerships, with all suppliers or customers because the implementation costs in terms of capital, time, and effort are too great (Lambert, Emmelhainz and Garnder 1996; Mentzer, Min and Zacharia 2000). Day (2000) also states that close relations are resource intensive and therefore not every customer is worth the effort.

Each relationship has its own set of motivating factors driving its development, as well as a unique operating environment. Therefore, the duration, breadth, strength and closeness of the relationship varies over time and from case to case (Lambert, Emmelhainz and Gardner 1996). Appropriate relationships are contextual and should be structured based on the characteristics of the situation in question (Cox 2001; Heide and John 1992). Hence there is a wide range of relationship structures possible within a supply chain. Businesses have to manage the development and maintenance of each

relationship in their portfolio. This entails recognizing the motivating factors, determining the appropriate relationship structure for a given situation, and measuring the value from the relationship. Research on relationship theory is discussed first, followed by relationship structure and relationship value.

**Relationship Theory**

The literature on interorganizational relationships is vast, with theoretical foundations ranging from economic to behavioral on the formation, maintenance and evaluation of these relationships. The various theories applied in the literature include transaction cost economics, agency theory, strategic management theory, resource dependence theory and the resource based view, the political economy framework, power-dependence theory, network theory, social exchange theory, distributive justice theory, and commitment-trust theory. Because business relationships combine both economic and behavior functions, all of these theories are necessary to contribute to understanding and explaining interorganizational relationships. However, they are applicable to different areas within interorganizational relationship research. Table 1.1 provides brief explanations of each of these theories and their applicable areas. This dissertation stems from the phenomenon that firms form a portfolio of different relationships; therefore, only those that apply to the formation of a portfolio of different relationships (in Table 1.1 in boldface print) - transaction cost economics (economic based), resource dependence theory/resource based view (behavior based), and network theory (both economic and behavior) - are used as a basis for this research and therefore

**Table 1.1**
**Examples Of Relationship Theories**[1]

| Theory | Description | Applicability |
|---|---|---|
| **Transaction cost economics** | **Firms choose their governance structure in order to minimize transaction costs (Williamson 1985).** | **Formation of a portfolio of relationships.** |
| **Resource dependence/ resource based view** | **The firm is a bundle of heterogeneous resources and capabilities. When resources or competencies are not available within the firm, they are likely to establish ties with other organizations to obtain them (Pfeffer and Salancik 1978; Barney 1991).** | **Formation of a portfolio of relationships.** |
| **Network** | **The firm gains access to resources controlled by other firms through interaction with other firms (Johanson and Mattsson 1987).** | **Formation of a portfolio of relationships.** |
| Agency | Concerned with determining the most efficient governance mechanism between the agent and principal (Eisenhardt 1989). | Evaluation of relationships once established. |
| Strategic management, stakeholder | Prospective partners need to achieve a fit between their respective strategies. Focuses on the motives for forming cooperative arrangements (Contractor and Lorange 1988; Freeman 1984). | Maintenance of relationships once established. |
| Political economy framework | A dyadic approach to channel behavior that integrates economic and sociopolitical factors (Stern and Reve 1980). | Formation and maintenance of relationships. |
| Power-dependence | Centers on the assumption that conflict is inherent and firms use power to maximize individual gain (Cadotte and Stern 1979; Gaski 1984). | Formation and maintenance of specific relationships. |
| Social or relational exchange | Evolution of interaction in business relationships – parties enter into and maintain relationships with the expectation that doing so will be rewarding (Thibaut and Kelley 1959). | Formation and maintenance of social relationships. |
| Distributive justice | Perceptions of fairness between parties are a consequence of intent for, contribution to, and valued from the relationship (Cook and Hegtvedt 1983; Deutsch 1975). | Evaluation of relationships once established. |
| Communications | Communication is a vehicle for information exchange, power exercise, program coordination, and participative decision making (Kent 1997). | Maintenance of relationships once established. |
| Commitment-trust | The presence of commitment and trust are central to promoting efficiency, productivity and effectiveness (Morgan and Hunt 1994). | Maintenance of specific relationships. |

[1] Developed using Child and Faulkner 1998 and Dabholkar, Johnston and Cathey 1994.

discussed in more detail. The others, although important for relationship theory, are not directly used to support the justification for this dissertation.

*Transaction Cost Economics*

Transaction costs are those incurred in arranging, managing, and monitoring transactions. The purpose of the theory of transaction cost economics is to explain the choice of how transactions are organized (Child and Faulkner 1998). Although Coase conceived the initial concept (1937), it is more often attributed to Williamson (1975, 1985, 1996) who led the evolution of the application of the concept from the firm to channel relationships. According to Williamson (1985), the attributes of the transaction, impacted by human behavior, play a key role in the choice of an appropriate governance structure. Governance structures range from market-based transactions (arms-length relationships) to hierarchies (vertical integration). Over the years, Williamson and other authors acknowledged there were possibilities of hybrid structures in the form of interorganizational relationships between the two extremes (Barringer and Harrison 2000; Child and Faulkner 1998; Heide and John 1988; Rindfleisch and Heide 1997).

The primary attributes or dimensions of transactions that give rise to transaction costs are asset specificity and uncertainty (Heide 1994; Rindfliesch and Heide 1997). Asset specificity is the degree of investments made in support of particular transactions that cannot be redeployed to other uses. Uncertainty refers to the situation in which the circumstances surrounding an exchange cannot be specified *ex ante*. Asset specificity creates the need for safeguards against one party acting opportunistically while uncertainty creates the need for firms to be adaptable (Heide 1994). The higher the need

for safeguards and adaptability, the higher the transaction costs, and the more likely firms will move away from arm's length market transactions toward integrated relationships (Heide and John 1988). Transaction cost economics has been successfully applied and tested empirically in various contexts within firms and channels (see Rindfleisch and Heide 1997 for a meta-analysis of 45 studies).

Transaction cost economics contributes insights into why various interorganizational relationships are formed. It provides a basic motivation – minimizing transaction costs through the most efficient relational structure. If costs are low, firms will favor market governance. If costs are high enough to exceed advantages of the market, firms will favor higher integration within their firm or with other firms (Rindfleisch and Heide 1997). No two dyads experience the same interplay between the transaction attributes and human behavior; therefore different relational structures are pursued.

*Resource Dependence Theory*

Both resource dependence theory and later, the resource based view, are founded on the principal that organizations face uncertainty about their supply of resources and competencies (including physical, human, financial, and organizational). When these resources and competencies are not readily or sufficiently available, firms are likely to establish ties with other organizations (Child and Faulkner 1998). Few organizations are internally self-sufficient. This creates potential dependence on other firms from whom resources are obtained and introduces uncertainty to the extent that resource flows are not

under control (Heide 1994). Purposely establishing ties with other firms is a strategic response to reduce the uncertainty and manage the dependence.

The earlier version of the theory, resource dependency, stated that resources must be obtained from external sources for an organization to survive (Barringer and Harrison 2000). It was believed that resource scarcity prompted organizations to engage in interorganizational relationships in an attempt to exert power or control over those that had resources (Pfeffer and Salancik 1978). As more cooperative relationships began to form, authors began to disagree with the power and control motive and developed the resource based view, which noted that important internal resources can be obtained from external sources (Barringer and Harrison 2000). Developing an interorganizational relationship is one way for firms to obtain these resources and is often the most practical.

Firms enter into relationships to fill perceived needs, one of which is resources. Each firm thus contributes necessary resources with the expectation of receiving valued returns (Child and Faulkner 1998). Interorganizational relationships allow firms to accumulate resources that are rare, valuable, hard to imitate, and have no readily available substitute. Relationships enable firms to take advantage of complementary assets and reduce redundancy (Dyer and Singh 1998). Firms that strive for competitive advantage seek interfirm governance structures in order to obtain the needed competencies for the advantage. However, different firms need different bundles of resources from the other members of their supply chains. Therefore, they are likely to pursue different relational structures to share whatever is appropriate.

*Network Theory*

Networks are complex, multifaceted organizational structures that result from multiple interfirm relationships (Webster 1992). They contain a system of autonomous and legally equal organizations connected by select and persistent business relations (Van Aken and Weggeman 2000). Networks are formed in response to dynamic business pressures. The theory of networks is built around the assumption that each part or process or function should be the responsibility of a specialized, independent entity (Cravens, Piercy and Shipp 1996; Webster 1992). Some authors argue that networks are more flexible, adaptable and relational in their form.

Authors describe networks as composed of organizations linked by a variety of different relationships. For instance, Cravens, Piercy and Shipp (1996) state that any given network may include one or several kinds of relationships, such as joint ventures, alliances, franchises, and collaborative relationships. Skjoett-Larsen (1999) describes the interaction among firms and that through this the parties develop various kinds of bonds – technical, social, administrative, and legal. Achrol (1997) discusses different levels of power, trust, and social norms within the ties in a network. Van Aken and Weggeman (2000) also discuss the distribution of power, as well as labor, ownership, and loyalty, within a network.

Achrol (1997) states that for an interorganizational relationship to work over the long term, it must be embedded in a network of relationships that collectively define and administer norms by which the relationships are conducted. He adds that organizations must exchange with a network of external actors to acquire what is necessary for survival and growth. What is necessary to accomplish these business objectives, such as

increasing responsiveness, obtaining skills and resources, and achieving efficiency and effectiveness, varies for each company. Each company's network is therefore comprised of a portfolio of different relationships.

**Relationship Structure**

Interorganizational relationships have historically been categorized by where they fall on a governance spectrum. The channels literature was the first to propose a range of relationships from arms length transactions (or market governance) to vertical integration (or hierarchical governance). More recently it has been recognized that integration of more than one firm may be more appropriate for the end of this range since one firm cannot effectively accomplish the control and management of the whole channel (or supply chain). Several authors have since acknowledged these two end points, arms length and integration, and placed interfirm cooperative relationships (types of relationships where there is cooperation between or among the firms involved) in the middle (Contractor and Lorange 1988; Heide 1994; Landeros and Monczka 1989; Rinehart et al. 2002; Webster 1992).

The different cooperative relationships have been identified as partnerships, alliances, joint ventures, network organizations, franchises, license agreements, contractual relationships, service agreements, and administered relationships, to name a few. Some authors have proposed where these relationships fall in relation to each other on the range between arms length and integration (Contractor and Lorange 1988; Webster 1992). These studies attempted to categorize the relationships based on the relationship

characteristics or type. Type is defined here as **the group or class of relationships that share common governance characteristics**.

With few exceptions, the construct of relationship magnitude has not been directly addressed in previous research. However, Rindfleisch and Moorman (2001) discuss the concept of relational embeddedness as the degree of reciprocity and closeness among new product alliance participants. This concept is based on the strength-of-ties literature, which is primarily concerned with the nature of the relational bond between two or more social actors. Tie-strength researchers typically classify the relation as linked by a strong or a weak tie. Strong ties are viewed as having higher levels of closeness, reciprocity, and indebtedness than weak ties (Granovetter 1973). Similar to the notion of strength-of-ties, coupling research looks at the relationships among elements or variables and their variation from loose to tight. Both strength-of-ties and coupling apply to relations between organizations as well as individuals. Thus, another component of interorganizational relationship structure is the magnitude of the relationship, defined as **the extent or degree of closeness or strength of the relationship among organizations** (Golicic, Foggin, and Mentzer 2003).

Some interorganizational research has discussed relationship structure in terms of more than one component, typically indirectly describing different intensities within one type of relationship. Birnbirg (1998) and Gulati (1998) both discuss strategic alliances as taking a variety of differing forms with different levels of ties. In their research on partnerships, Lambert, Emmelhainz, and Gardner (1996) distinguish among three different levels based on the interactions and closeness between the partners. Within the type of partnership, the authors distinguish among coordination between the partners

(what the authors term Type I), progress beyond coordination to integration (Type II), and significant integration (Type III). Barringer and Harrison present several types of interorganizational relationships with varying degrees of linkages or coupling (2000). Golicic, Foggin and Mentzer (2003) organize and synthesize the literature in order to distinguish relationship magnitude as a separate component of relationship structure to drive future research.

**Relationship Value**

Value has been defined as an evaluation of the benefits received versus the costs that were paid to obtain the benefits (Monroe 1990). As an outcome of relationships, it has been used interchangeably with quality and satisfaction. In the business-to-consumer context, a consumer decides if they feel satisfied with a product or service based on the perceived performance (benefits) compared to a standard (costs). There have been a few studies in the business-to-business context on satisfaction in relationships, as well as on relationship quality. Recent articles have examined the specific concept of relationship value as an assessment of satisfaction with the exchange, coupled with a comparison of alternatives. Theories in both contexts on value, quality, and satisfaction are examined in more detail.

*Business-to-Consumer Context*

The evaluation of satisfaction has received a great deal of attention in consumer behavior literature. Satisfaction is generally defined as an evaluation process - what consumers do to arrive at the feeling of being satisfied (Oliver 1999). For instance,

consumer satisfaction or dissatisfaction is the result of a comparison process historically equated to the disconfirmation paradigm in consumer behavior research. The comparison takes place between some initial standard created from a frame of reference and the perceived discrepancy from the initial standard based on performance of the product or service (Oliver 1980). If there is no discrepancy, then confirmation results. If the comparison outcomes are better (poorer) than expected, then positive (negative) disconfirmation results. In addition to the disconfirmation paradigm, other theories on satisfaction have begun to surface (for example, see Fournier and Mick 1999; Gardial et. al. 1994). However, all of these have the common thread of an evaluation process in which performance of the product or service is compared to some standard.

The antecedents to this evaluation process are the perceived actual performance of the product or service and the different standards used to compare the performance. Standards have previously been identified as expectations. Expectations are predictions of performance (Oliver 1980; Woodruff, Cadotte, and Jenkins 1983). As consumer behavior theory evolved, other ideas of what consumers valued surfaced. Woodruff et al. (1991) provide a summary of earlier standards research. The authors present expectations, equity, experienced-based norms, desires or values, ideals, and seller's promises as the different types of standards. Woodruff and Gardial (1996) add industry norms to the types of norms used for comparison. Finally, Neeley and Schumann (2000) present perceived social approval, which reflects a consumer's consideration of other persons' reactions to a purchase, as another comparison standard.

While authors agree that satisfaction/dissatisfaction are motivators for some behavior, research on the consequences of satisfaction has been somewhat limited.

Anderson and Sullivan (1993) propose repurchase intentions as the sole outcome. Loyalty (in the form of repeat purchases), a higher share of purchases, and word of mouth were found to be the consequences of satisfaction in a retail setting (Reynolds and Beatty 1999). In their meta-analysis on consumer satisfaction studies, Szymanski and Henard (2001) examine the 15 studies that incorporate outcomes of satisfaction, which include repeat purchase, word of mouth, and complaining behaviors. The common thread of repeat purchases is retention of the relationship with the consumer.

Bolton (1998) discusses how important it is to draw a link between satisfaction and duration or retention of the relationship – this link is how a company financially justifies the efforts put into the relationship. She argues the decision to maintain the relationship is a tradeoff between or comparison of assessments of future costs and utility or benefits, and this equates to the perception of future value. Determination of the value consists of an evaluation of prior satisfaction adjusted to incorporate new information, both of which are impacted based on prior experience. While this idea of value is similar to that of Monroe (1990), it states that the perception of future value from the relationship is the same as the decision to maintain the relationship. If this is the case, then according to her study, value is a consequence of satisfaction. Lemon, White and Winer (2002) provide a similar conceptualization. They discuss the keep/drop decision based on evaluations of current and past performance, along with consideration of future benefits and regrets. A party will stay in a relationship if the utility in keeping it is greater than the utility in dropping it or if there is value in it.

*Business-to-Business Context*

Although there is much related research in consumer behavior, research on these concepts in business-to-business situations is more limited. As Swan and Trawick (1993, pg. 30) noted in their review of consumer satisfaction research, "almost nothing" has been done with regard to industrial buyer satisfaction. Since this review, a few specific studies have emerged. One study addresses the comparison standards during business relationship formation (Garver and Flint 1995), and another article briefly describes how customer satisfaction may enhance supply chain relationships (Fawcett and Swenson 1998) by eliminating service gaps and helping customers meet their customers' needs. Patterson, Johnson, and Spreng (1997) were the first to empirically test the determinants of satisfaction in a business-to-business context, providing support for applying consumer behavior theory to customer interactions in the services industry. In 1999, Geyskens, Steenkamp, and Kumar published a meta-analysis of 71 studies that included satisfaction in their channel relationship models in order to establish generalizations. The original studies focus on satisfaction as a consequence of channel relationships and relate satisfaction to more than 80 different variables, often with inconsistent findings across the studies.

Jap, Manolis, and Weitz (1999) discuss the concept of the quality of a business-to-business relationship. They view it as consisting of evaluations of various aspects of the relationship, including attitudinal, process and future expectations. This is not unlike the evaluations of satisfaction and value in consumer behavior research. Krapfel, Salmond and Spekman present a discussion of relationship value as embodying the factors from which dependence flows (1991). They argue the value of a relationship to a

seller is a function of four factors – the criticality of the product or service to the buyer, the quantity of the seller's output consumed by the buyer, the replaceability of the buyer, and the cost savings the seller realizes from the buyer's practices and procedures. The authors do note that value is relative and gauged given comparison levels of alternatives. While Salmond and Spekman's effort attempted to measure the value of a relationship, it has not received much attention since it was presented.

In their study on relationship retention, Gassenheimer, Houston, and Davis (1998) propose that the evaluation of value determines whether or not parties remain in the relationship. Valued relationships, they state, are sociopolitically and economically motivated by satisfaction and a comparison of alternatives. This implies the evaluation of satisfaction is antecedent to value. The meaning of value stems from transaction cost economics and social exchange theory. Transaction cost economics, discussed in detail earlier, provides the economic motivation in that it favors exchange relationships that minimize transaction costs. Social exchange theory argues that relationships are evaluated behaviorally as well. Social value is based on both the satisfaction with an exchange partner and a comparative evaluation of alternative options for accomplishing the goals of the relationship (Thibaut and Kelley 1959). Retention of the relationship then occurs if the value provided outweighs the cost of the relationship and the benefits of alternatives.

**Research Gaps**

The research described above provides a foundation for the study of interorganizational relationships. However, existing research is not clear enough to

understand and explain some of the phenomena that can be observed in these complex relationships. The gaps in the research therefore present opportunities for further study.

*Relationship Structure*

Interorganizational relationship theory, specifically transaction cost economics, resource dependence theory/resource based view, and network theory, has contributed to the understanding of why companies form a variety of relationships with other firms. The explanatory power of each of these three theories has been criticized in the literature. For example, transaction cost economics does not account for the evolution of relational or social aspects of relationships (Barringer and Harrison 2000; Child and Faulkner 1998; Gassenheimer, Houston and Davis 1998). It is seen by many to be limited and therefore static in its assumptions regarding uncertainty and opportunism, the number of transactions, and its treatment of switching costs (Dabholkar, Johnston and Cathey 1994; Skjoett-Larsen 1999). Resource dependence/based theory fails to examine different structural arrangements for relationship governance other than that for obtaining resources (Heide and John 1992; Heide 1994; Skjoett-Larsen 1999). It also does not explain how organizations interface, although it argues for social exchange (Barringer and Harrison 2000). Network theory, which addresses some of these critiques, does not provide direction as to which relational structures are more efficient (Skjoett-Larsen 1999).

Authors have addressed these limitations in the past by linking various interorganizational theories together to explain certain phenomena. The three discussed here have been linked by Skjoett-Larsen (1999) as an economic, sociological and

strategic approach to analyzing supply chain management. Specifically, he uses them to develop a conceptual framework for managing a portfolio of customer-supplier relationships. However, the author only discusses relationship types, which mirror the major categories of relationship governance as presented by Heide (1994) – market, contracting (relational governance), and partnerships or vertical integration. These three theories could be used to analyze another component of relationship structure (i.e., magnitude) in the management of a portfolio of relationships. In addition, these theories could be applied together to examine and understand the situations that drive the formation of different relationships.

Much has been written in both the popular press and academic literature about the drivers and expected benefits from various interorganizational relationships, such as alliances, partnerships, collaborative relationships, and integrated relationships. However, a high level of ambiguity exists among the different descriptors of relationships (Cravens, Shipp and Cravens 1993; Rinehart et al. 2002). The terms to describe these various relationships are often used interchangeably, creating confusion for both practitioners and academics alike. Recent work has begun to address this concern by clarifying the difference between two different components of relationship structure, i.e., the **type** and the **magnitude** of the relationship (Golicic, Foggin and Mentzer 2003). Because these dimensions have just recently been distinguished, there is very little research on relationship magnitude. This construct needs to be operationalized and tested empirically to provide support for its distinction from relationship type. It also needs to be linked with relationship antecedents, such as what drives the level of magnitude, and consequences, such as the value of the relationship.

*Relationship Value*

Satisfaction, quality and value have all been examined as outcomes of channel relationships. A tremendous amount of consumer behavior research shows that satisfaction is the result of an evaluation process. Patterson, Johnson, and Spreng (1997) incorporate this theory in the business-to-business context, specifically testing the disconfirmation process. Relationship quality and value are also presented as results of an evaluation process. However, it seems that there is confusion in differentiating among these three concepts and how they are related to each other and other relationship outcomes. Relationship value needs to be understood and studied as a separate construct in the business-to-business context. Much can be gleaned from the existing research to help synthesize and further develop theory on the value from interorganizational relationships.

Cannon and Perreault (1999) state that customer and supplier firms do not always select the "optimal" relationship for a given situation. Many firms have no idea where to begin to determine just what the optimal is. Cox (2001) reasons that buyers often pursue inappropriate relationship management strategies because they do not fully understand their circumstances. Firms must make the decision to invest scarce resources in their various relationships. These resources should only be dedicated to those relationships that will truly benefit from the investment (Lambert, Emmelhainz and Gardner 1996). Theory on interorganizational relationships needs to be extended to not only understand but also predict the most appropriate relationship structure for a given business situation based on obtaining the highest value.

## CONCEPTUAL FRAMEWORK

Firms are involved in a number of different relationships with other members of their supply chains. These relationships have a multitude of different characteristics based on the supplier or customer in the relationship and the goals of the companies involved. The portfolio may include relationships of different types (e.g., partnerships, alliances) with different levels of magnitude. Depending on the magnitude of the relationship, firms commit various resources to a particular relationship. Closer relationships generally require more personnel, more time, more frequent communications, and ultimately more money. The expectation is that firms receive greater benefit from the close relationships, benefits that far exceed the costs of maintaining it (i.e., greater value). Although the firm may receive value from a relationship, it may not be the optimal level of magnitude. In other words, a different level of relationship magnitude may provide higher benefits and/or lower costs than the existing relationship.

In many business situations there is no specific strategy or plan for the development of a particular interorganizational relationship structure. Relationships are often formed as a reaction to business circumstances to meet their needs at the time (Cannon and Perreault 1999). Changes in business situations do not necessarily lead to changes in relationships. Personnel often rely on the history of the relationship and allow it to continue at its current level. When a new relationship is needed, firms do not always know what level of magnitude would be best to pursue. The ideal situation would be for firms to be able to predict what level of magnitude provides the most value in a given situation so they can structure their interorganizational relationships appropriately.

Figure 1.1 presents the conceptual model that this dissertation will justify and test. The construct of relationship magnitude is proposed to consist of three interrelated dimensions – trust, commitment, and dependence. The perceived situational drivers (i.e., the business situation) drive the level of magnitude that is pursued. The magnitude then affects the type of relationship. The relationship in turn affects the perception of the value (benefits/costs) of the relationship. As shown in the extended model in Figure 1.2, there are antecedents that lead to the situational drivers and consequences that result from relationship value, such as the decision to stay in the relationship, increased levels of magnitude (Movando and Rodrigo 2001), increased performance, and competitive advantage (Ganesan 1994). Testing these antecedents and consequences are beyond the scope of this dissertation and are left for future research. The following section summarizes the objectives of this dissertation and the specific research questions explored.

## RESEARCH OBJECTIVES AND QUESTIONS

The principal objective of this dissertation is to contribute to interorganizational relationship theory by filling the gaps in prior research. Specifically, this research examines the construct of relationship magnitude in more detail, including operationalizing the construct, testing its components, and differentiating it from the type of relationship. Understanding that companies manage a portfolio of different relationships, the research ascertain what situations drive various relationship structures, with a focus on the magnitude. The impact of the relationship structure on the evaluation of value is also examined.

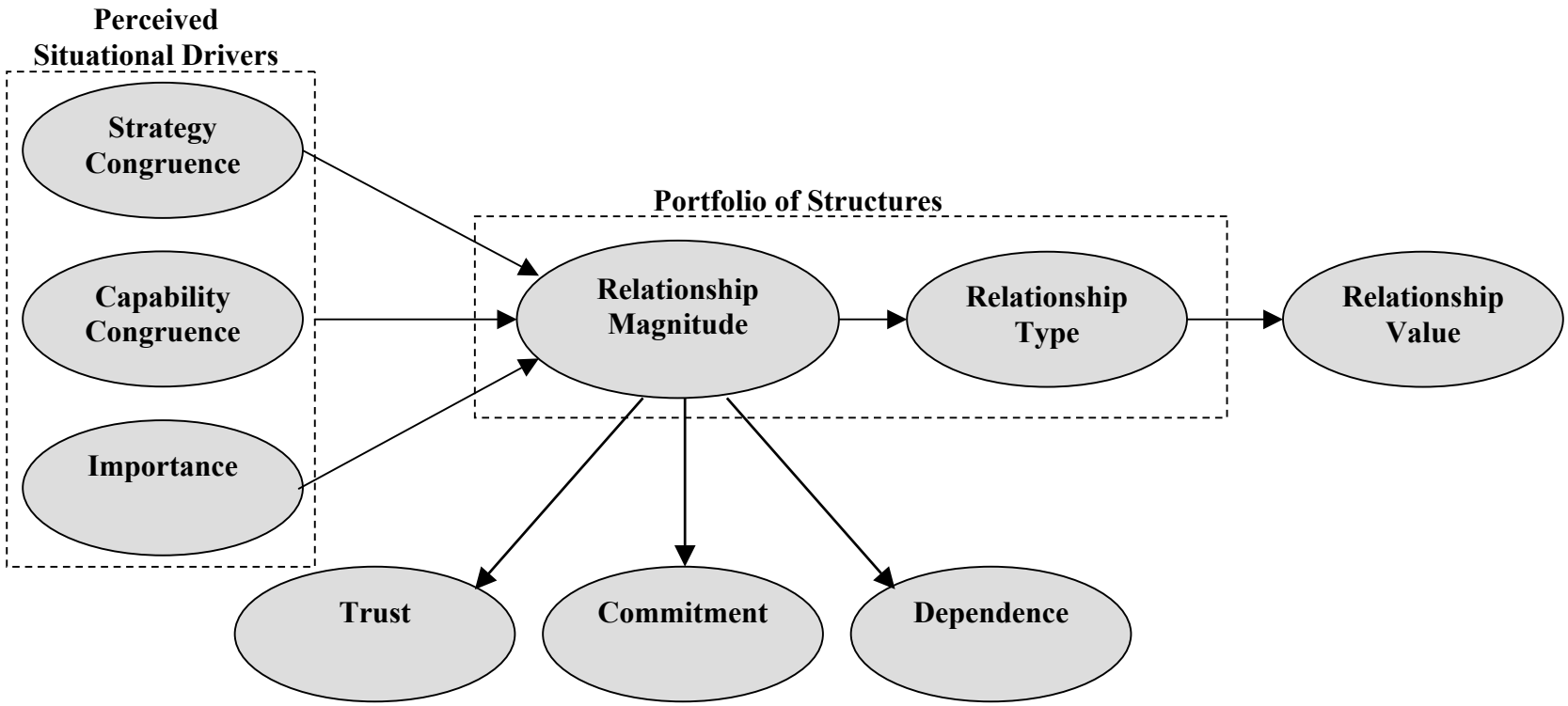



**Figure 1.1**
**Conceptual Model**

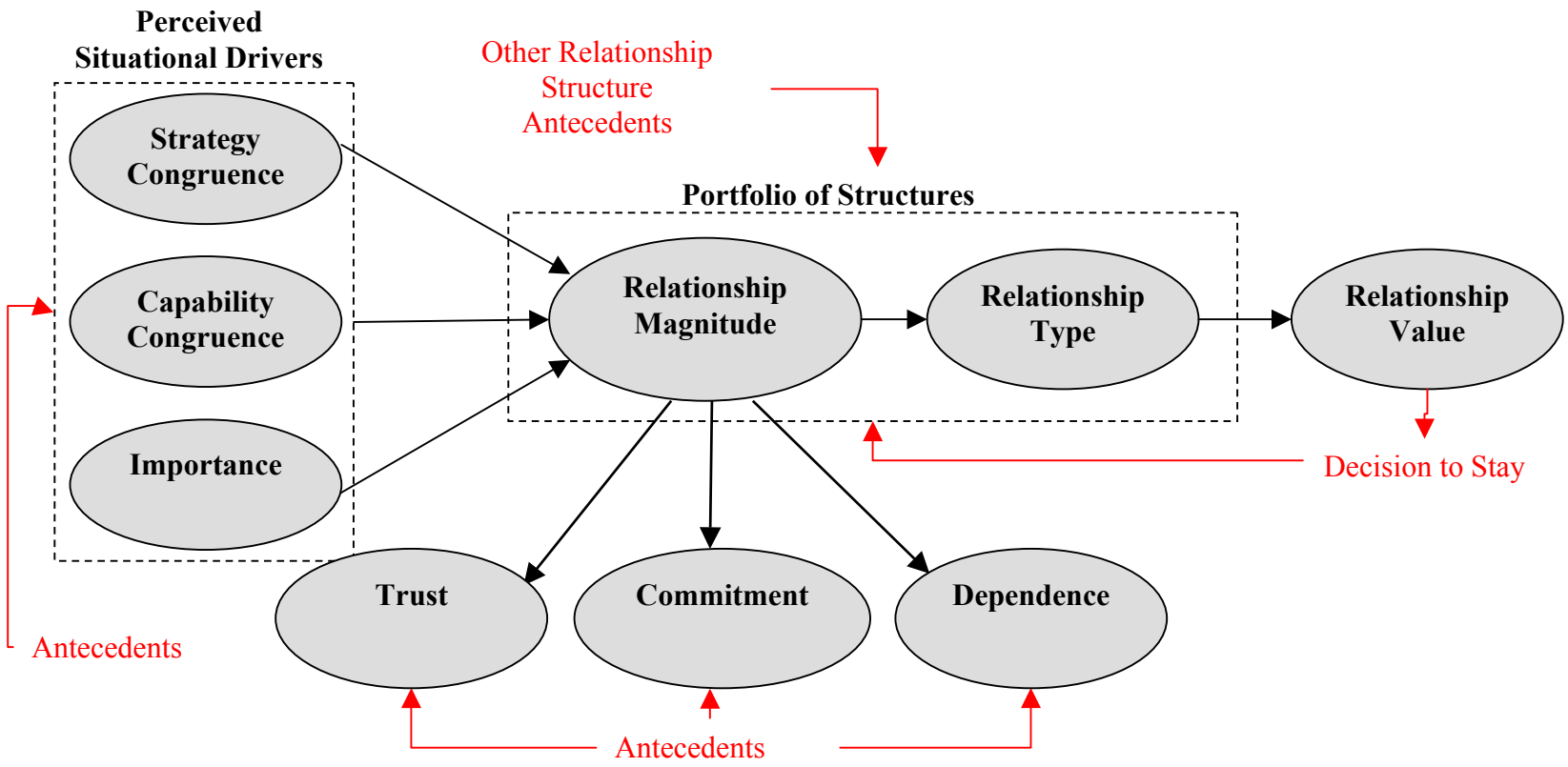



**Figure 1.2**
**Extended Model**

This research seeks to answer the primary question, "What is the effect of the level of magnitude on relationship type and on the perception of value from the relationship?" Secondary questions are explored as well. These include:

- How does the business situation drive the level of magnitude?
- What is the optimal level of magnitude for a given situation (as determined through value)?
- How do companies perceive and measure relationship value?

By accomplishing these objectives and answering these questions, this dissertation contributes to both theory and practice as discussed in the following section.

## CONTRIBUTION OF THIS RESEARCH

This research was designed to extend the body of knowledge on supply chain management by examining the management of interorganizational relationships. One way it accomplishes this is through the examination of interorganizational relationship structure and the phenomenon of relationship magnitude, its components, and its link to relationship value. Trust, commitment and dependence, often antecedent to relationship outcomes and performance, are examined as dimensions of magnitude, a second order construct. Although it is not a new phenomenon, magnitude has not been explicitly recognized in the literature until recently due to the lack of differentiation among interorganizational relationships forms. Measures for the construct of relationship magnitude are developed and tested. Results of this research also provide insight to the proposition that magnitude is a distinct phenomenon, separate from relationship type, another component of relationship structure as discussed in the Research Gaps section.

This dissertation explores the different situations that drive companies to develop particular relationships. The most prominent situations are examined, and the research determines the role these play in the relationship and the perception of value of the resulting relationship. Relationship value has received some attention in prior research, primarily through the concepts of relationship quality and satisfaction. This research examines the process and metrics used to determine the value (i.e., benefits/costs) of an interorganizational relationship.

Firms have limited resources and can therefore only invest in a limited number of close relationships. They need to determine with whom it makes the most sense to pursue stronger relationships and where weaker relationships serve to best accomplish their supply chain goals. The research should help managers develop strategies for managing a portfolio of relationships with firms in their supply chain and investing resources where it makes the most sense. With the push for developing closer relationships, managers need to know what the optimum level of magnitude is given the different situations they experience within their supply chains. They can then make the decision to pursue a particular level of relationship magnitude or try to change their business situation in order to achieve the highest value from each relationship, which then ultimately impacts the firm's performance.

This research is also expected to impact the theories generally applied to interorganizational relationships. The research uses resource dependence theory, network theory, and transaction cost economics to explain why a firm develops a portfolio of different relationships with other firms. These theories are all well received in the various disciplines that study interorganizational relationships, and some of them have

been used in combination in other research (see Gassenheimer, Houston and Davis 1998; Skjoett-Larsen 1999). This research attempts to demonstrate that the application of several theories is needed as each brings specific nuances to interorganizational relationship research. As business-to-consumer theory regarding relationships has been applied in the business-to-business context, learnings from this dissertation may be applied to the business-to-consumer realm. Lastly, this research should be a stepping-stone for theory building in supply chain management, an area in need of more theory development (Mentzer et al. 2001a and b).

## DISSERTATION ORGANIZATION

This dissertation is divided into five chapters. Chapter 1 is the introduction; Chapter 2 provides the literature review; Chapter 3 provides the research methodology; Chapter 4 discusses the results; and Chapter 5 presents the conclusions drawn from this research.

Chapter 1 serves to introduce the impetus for studying the phenomenon of relationship magnitude and its affect on the evaluation of relationship value. The chapter also provides a brief overview of the theoretical basis for the research, the research objectives, the potential contributions expected from this research, and an outline of the organization of this dissertation.

Chapter 2 provides the information used to build the theory for this dissertation based on observation of the phenomenon in practice, coupled with a literature review. The chapter also presents the research hypotheses tested as part of this dissertation. It is structured into eight major sections: 1) the introduction; 2) the organizing framework of

the literature review; 3) the observation methodology; 4) relationship structure; 5) dimensions of relationship magnitude; 6) situational drivers; 7) relationship value; and 8) the relationship structure model and summary of research hypotheses.

Chapter 3 discusses the methodology used to test the model and associated hypotheses. Included are discussions of the research design, measurement development and purification, data collection and data analysis procedures.

Chapter 4 explains the data analyses and the results of hypotheses testing. A comprehensive evaluation of the final sample data is provided, including: sample response rate, demographics, descriptive statistics, and nonresponse bias. Reliability and construct validity are tested, using the final sample data, for each of the constructs in the magnitude-value structural equation model (RSSEM). Finally, the RSSEM is evaluated and the results of the hypotheses testing presented.

Chapter 5 presents conclusions and implications of the results of the hypotheses testing. Also discussed are the dissertation's theoretical and managerial contributions and limitations. Finally, suggestions for future research are considered.

# CHAPTER 2 –BUILDING THE THEORY

Supply chain management is a key area of study in business. It has been defined in different ways by different authors:

- An integrative philosophy to manage the total flow of a distribution channel from supplier to the ultimate user (Cooper et al. 1997);
- The development of trust and commitment to the relationship and integration of logistics activities involving the sharing of demand and sales data (LaLonde and Masters 1994); and
- A concept whose primary objective is to integrate and manage the sourcing, flow, and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers (Monczka, Trent and Handfield 1998).

Mentzer et al. (2001a and b) organized and synthesized many of the literature definitions of supply chain management along with its antecedents and consequences to come up with an encompassing definition. According to these authors, supply chain management is **the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole**. It is in essence the management of relationships and the flow of resources within these relationships. Companies struggle to successfully manage their

supply chains. One reason for this is the dynamics that come into play when managing interorganizational relationships.

Although there is much research on interorganizational relationship management, it is difficult for companies to know what to do with this because much of it is ambiguous, particularly the terms used to describe different relationships (Cravens, Shipp and Cravens 1993; Lambert, Emmelhainz and Gardner 1996; Rinehart et al. 2002). Using the literature and a qualitative study, Golicic, Foggin, and Mentzer (2003) distinguished between two components of relationship structure, relationship type and magnitude, to help clarify the different relationship forms. The phenomenon of relationship magnitude is relatively new with no empirical support for its distinction from relationship type, its drivers, its components, or its consequences. Hence this dissertation sought to fill this gap.

Both observations of the phenomenon in practice as well as a literature review were used in the development of the theoretical model. This chapter provides a review of the literature from which the theoretical foundation for the magnitude-value model was developed. This is coupled with qualitative research to obtain detailed information on the constructs of interest in practice. The literature review is an integrative investigation of the logistics, marketing, strategic management, economics, psychology, and sociology literature from which the nomological network for the model was developed. In addition, the chapter explains the relationship structure model and the research hypotheses that were tested as part of this dissertation.

This chapter is structured into eight major sections: 1) the introduction; 2) the organizing framework of the literature review; 3) the observation methodology; 4)

relationship structure; 5) dimensions of relationship magnitude; 6) situational drivers; 7) relationship value; and 8) the relationship structure model and summary of research hypotheses.

## ORGANIZING FRAMEWORK

The justification for the relationship structure conceptual model was developed from the integration of logistics, supply chain management, marketing, economics, psychology, and sociology literature. Each of these literature domains was included in order to provide a comprehensive review of the extant research that supports the research questions described in Chapter 1. The primary research question was: What is the effect of the level of magnitude on relationship type and on the perception of value from the relationship? Secondary questions included: How does the business situation drive the level of magnitude, how do companies perceive and measure relationship value, and what is the optimal level of magnitude for a given situation?

The principle concepts of relationship magnitude, relationship type, relationship value, and situational drivers drove the literature review. Many disciplines are involved in relationship research; hence all of these different disciplines were consulted to obtain as comprehensive a picture of the concepts as possible. Logistics, supply chain management and marketing provide the basis for research in interorganizational relationships. Through both conceptual and empirical research, this literature describes the different forms of relationships, the consequences of relationships and the antecedents or drivers for relationships. The economics literature was added because of its theoretical contribution to the reasons relationships are formed and how they are often evaluated

(i.e., economic outcomes). The construct of business-to-business relationship magnitude is a new one, and in order to better understand it, the psychology and sociology literatures were consulted to draw from theories on interpersonal and inter-group relationships.

Much of the existing research on three of the four main constructs (relationship magnitude, relationship value, situational drivers) is ambiguous and primarily conceptual. Therefore a qualitative study, described in the following section, was conducted to add support to these constructs and the theoretical relationships among them. In order to facilitate an integrated presentation of the literature and observations determined from the qualitative study, subsequent discussion follows the conceptual framework presented in Chapter 1. First, the focal constructs that comprise relationship structure - magnitude and type - are presented, followed by discussions of the dimensions of magnitude. The situational drivers that precede relationship magnitude are then presented followed by relationship value. The chapter concludes with a summary of the constructs and hypotheses in the relationship structure model.

## OBSERVATION METHODOLOGY

The literature on some of the constructs under examination is sparse. In order to supplement the existing research in constructing the theory for this dissertation, qualitative research was conducted. Qualitative methods are ideally suited to research substantive areas about which little is known (Stern 1980). The qualitative research was meant to help clarify the main constructs and support the relationships among them so that a stronger theory and subsequent test of the theory could be constructed. Content analysis of depth interviews with relationship managers was chosen to accomplish these

objectives. Communication is a central aspect of social interaction, and content analysis procedures operate directly on text or transcripts of human communications (Weber 1990). It is useful for studying beliefs, organizations, attitudes, and human relations (Harris 2001); thus it was deemed most appropriate for analyzing interviews intended to clarify practitioner views on relationship magnitude, its situational drivers, and relationship value.

**Research Design**

There are many ways to conduct content analysis, as it is used for a variety of research purposes (e.g., analyzing mass communications, comparing languages and cultures, etc.). One commonly used process involves the following eight steps (Harris 2001): 1) identify the questions to be asked and constructs to be used; 2) choose the texts to be examined; 3) specify the unit of analysis; 4) determine the categories, or themes of meaning, into which responses are divided; 5) generate a coding scheme or coding rules; 6) conduct a sample or pilot study; 7) collect the data and revise the scheme as necessary; and 8) analyze the data and assess validity and reliability. Actions taken for each step are described, and Table 2.1 summarizes the actions for the first six steps as well.

The constructs to be used were defined prior to choosing content analysis as the suitable methodology. Questions focused on clarifying how firms view the constructs of interest. Depth interviews were deemed the best way to determine answers to the questions. Interviews allow for a rich understanding of phenomena in context. Transcripts of the interviews could then be examined for their content related to the

**Table 2.1**
**Content Analysis Process Steps**

| Step | Action |
|---|---|
| Identify the questions to be asked and constructs to be used | Constructs: relationship magnitude, situational drivers, relationship value<br>Questions: How do firms describe the magnitude of their relationships? What drives a firm to form a particular level of magnitude in a relationship with another company? What drives a firm to change a relationship and make it closer or more distant? What value do firms believe they get from relationships? How do firms measure relationship value? |
| Choose the texts to be examined | Considering the research questions, transcribed interviews with relationship managers are appropriate |
| Specify the unit of analysis | The unit of analysis or recording unit is the interfirm relationship – questions were centered around the respondent firm's relationships |
| Determine the categories, or themes of meaning, into which responses are divided | Responses are divided into themes or nodes based on the constructs and their context – industry characteristics, measure, portfolio, relationship magnitude, relationship type, relationship value, situational drivers, supply chain management |
| Generate a coding scheme or coding rules | Rules are created for the coders to define the recording units and categories and to document the process for assessing reliability and validity |
| Conduct a sample or pilot study | Two pilot interviews are conducted to test the coding scheme and categories |

constructs. Interviews therefore focused on asking the respondents about relationships their firm had with other firms.

Categories or themes for dividing the responses were developed based on the constructs of interest and the context within which they were being explored. These categories, or themes from the interviews, include: industry characteristics, measure, portfolio, relationship magnitude, relationship type, relationship value, situational drivers, and supply chain management. Rules for coders to follow in data analysis were developed. These rules were incorporated into a documented coding scheme to ensure consistent coding. The coding scheme can be found in Appendix A, Content Analysis Supplement. Two pilot interviews were then conducted to test the interview protocol, coding scheme, and response categories. The coding scheme and response categories were additionally tested on existing interorganizational relationship focus group data to ensure the ideas transcended to different companies in different contexts. Each of these was revised as necessary based on the pilot analysis.

**Sample and Data Collection**

Because the unit of analysis is the supply chain relationship, the sample was purposefully drawn from interconnected companies within supply chains to locate the phenomenon of interest. Specifically, employees involved in managing relationships with suppliers and/or customers were interviewed. A total of 14 depth interviews representing 3 different supply chains (automotive, pharmaceutical, and plastics) were conducted. Those interviewed held various positions within their companies ranging

from Materials Supervisor to Senior Vice President. A protocol was developed and revised by the researcher to guide the interviews and was reviewed by colleagues familiar with the phenomenon of interest. The interview protocol can be found in Appendix A. In addition, the interview questions were also asked of three focus groups each consisting of supply chain executives from 2-4 different companies. McCracken (1988) states that eight respondents are sufficient for many research questions; therefore, the number of participants for this research was sufficient to tap the domain of the constructs of interest.

Each interview began with an introduction and questions to ascertain demographic data. This established a rapport between the interviewers and the participants and helped create an understanding of the purpose of the study (Strauss and Corbin 1998). All respondents were assured of confidentiality. General questions from the protocol guided the interviews, such as "What kinds of relationships do you have with suppliers/customers? What would cause you to change the level of closeness in a relationship? What value does your company get from a specific relationship?" These were each followed by prompts as necessary to obtain deeper descriptions of a company's relationships based on the perceptions of the interviewee. All interviews were audiotaped for subsequent transcription to minimize researcher bias and support data quality and reliability in analysis.

**Data Analysis and Quality**

The primary researcher systematically organized and coded over 300 pages of interview transcripts into the eight themes of meaning described in the research design. A second researcher independently coded the 14 depth interviews following the rules in

the coding scheme. After determining reliability, the two researchers then reconciled their codes, and any initial discrepancies were resolved by consensus. Coding was facilitated with the latest QSR qualitative research software, NVivo (QSR International Pty Ltd. 2000), which is specifically designed for performing indexing, searching, and theorizing on qualitative data. Interpretations of similarities and differences within the categories, together with the literature, lend support to the theoretical model and descriptions of each construct developed in this chapter.

In content analysis, the quality of the analysis is determined by reliability and validity. When validating evidence is absent as is the case in this exploratory research, the researcher must use everything possible to assure the results are valid. The research design (categories, coding scheme, pilot test) created for this study helps insure that data resulting from the research represent variations in real phenomena due to the consistency of execution.

There are three types of reliability – stability, reproducibility, and accuracy (Krippendorff 1980; Weber 1990). Stability is the extent to which the results of the analysis are invariant over time. This is supported through test-retest of the data. The primary researcher coded the 14 interviews twice with a minimum of a three-month time lag between coding. The agreement between the two tests was 73.0%. The majority of the conflicting codes were on the themes of magnitude and value; however this was partially due to the ongoing literature review and conceptualization of these constructs for this dissertation during the time lag. The second type of reliability, reproducibility, is the extent to which two or more independent coders obtain the same results. This is supported through test-test of the data. Two independent coders achieved an agreement

of 84.7% for this research. These levels of agreement are acceptable, as unreliabilities will not seriously affect the structure of the theory and quantitative study. Accuracy, the third type of reliability, is the extent to which the interpretations correspond to a standard or norm. Standards are rarely established for data; therefore "it is unrealistic to insist on this criterion, and data should at least be reproducible" (Krippendorf 1980, pg. 132). For this study member checks were conducted with the interview participants in an attempt to support accuracy of the interpretations. There were no disagreements with the summary of interpretations.

Reliability sets limits to the potential validity of research results but does not guarantee it. There are three types of validity in content analysis as presented by Krippendorf (1980) – data-related, product-oriented, and process-oriented. Due to the purpose of the qualitative phase, some of the validation is left for the quantitative, theory-testing phase. The first type is data-related validity, which is how well a method of analysis represents the information inherent with available data. Semantical validity and sampling validity contribute to this type. Semantical validity assesses the degree to which a method is sensitive to meanings relevant within a given context. The analysis of the interviews was not only sensitive to the context, but the categories were structured around the context of the research. In addition, the coders were both familiar with the nature of the context, interorganizational relationships. Sampling validity assesses the degree to which data are from an unbiased sample. Because this research was exploratory and to be used to supplement literature in theory building, the sample was purposive. This component of data-based validity was supported in the quantitative phase of the research.

The second type of validity is product-oriented, which assesses how well a method works under a variety of circumstances. This is supported through correlational and predictive validity. Construct validity in the quantitative study addressed this. Process-oriented validity is the third type. It assesses the degree to which an analytical procedure models relations in the context of data. The first step to supporting this type is an effort to generalize available knowledge to the particular context within which data are content analyzed. The second step is an effort to logically derive from valid generalizations the particular propositions underlying the procedure used. These two steps were taken when structuring and justifying this research; available knowledge was used to propose relationships among the phenomena of interest, which then led to the qualitative research to confirm the ideas in context. Next the findings from the content analysis are presented with information from existing literature following the theoretical framework presented again in Figure 2.1.

## RELATIONSHIP STRUCTURE

Inconsistency in the definitions and use of relationship terms has created problems for the interpretation and replication of research findings. One reason for this may be that researchers are not consistent in the characteristics that differentiate and lead to different relationship structures. Personal relationships are structured based on needs and the level of attraction or intimacy between two or more people. In social psychology, attributes such as trust, commitment and dependence often describe the intimacy or level of closeness of the relationship as opposed to the type of relationship (e.g., friendship, marriage). Analogous to this, Golicic, Foggin, and Mentzer (2003) propose the structure

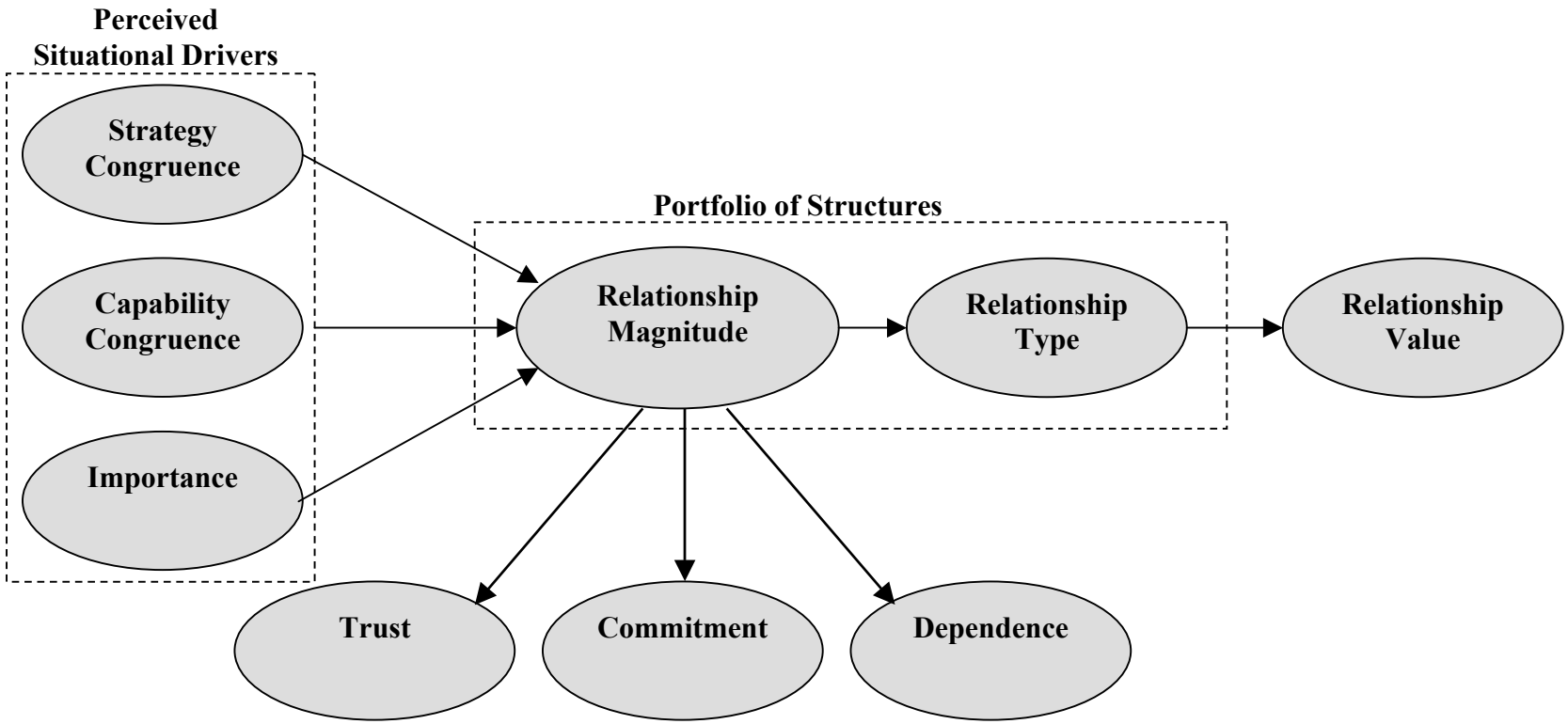



**Figure 2.1**
**Conceptual Model**

of interorganizational relationships is composed of relationship type, with the distinct construct of relationship magnitude antecedent to type.

**Relationship Type**

Interorganizational relationships have historically been categorized by where they fall on a governance spectrum. The channels literature was the first to propose a range of relationships from arms length transactions (or market governance) to vertical integration (or hierarchical governance). More recently it has been recognized that integration of more than one firm may be more appropriate for the latter end of this range since one firm cannot effectively accomplish the control and management of the supply chain. Several authors have since acknowledged these two end points, arms length and integration, and placed interfirm cooperative relationships (types of relationships where there is cooperation between or among the firms involved) in the middle (for example, Contractor and Lorange 1988; Heide 1994; Landeros and Monczka 1989; Nevin 1995; Webster 1992). Some authors have proposed where different cooperative relationships fall on the range between the types of arms length and integration (Contractor and Lorange 1988; Webster 1992). These studies attempted to categorize the relationships under a particular type based on the relationship characteristics. Thus, type is defined here as **the group or class of relationships that share common governance characteristics**.

Different types of relationships have received a great deal of attention in the literature; however, there is little consensus about the terminology and typology for describing them (Cravens, Shipp and Cravens 1993; Rinehart et al. 2002; Webster 1992).

For example, Cannon and Perreault (1999) conducted an empirical study in which they classified eight different types of relationships displaying different combinations of five characteristics. The authors called the eight types basic buying and selling, bare bones, contractual transaction, customer supply, cooperative systems, collaborative, mutually adaptive, and customer is king. A similar study by Rinehart et al. (2002) used different characteristics and had practitioners name the types rather than naming the types themselves. This resulted in seven relationship types (non-strategic transactions, administered relationships, contractual relationships, specialty contract relationships, partnerships, joint ventures, and strategic alliances), which reflected those often represented in the literature and used by managers.

Based on the literature, the most commonly discussed categories of relationship structure types are arms length, cooperative relationships (which include those that are administered or governed by contracts), and integration (Contractor and Lorange 1988; Heide 1994; Landeros and Monczka 1989; Nevin 1995; Webster 1992). Golicic, Foggin and Mentzer (2003) provide a summary of these three main types along with examples of the specific relationship terms discussed in the literature. There seems to be no disagreement about the categories on the ends – arms length consists of discrete transactions (Contractor and Lorange 1988; Heide 1994; Webster 1992) and integration is where one firm performs all supply chain functions (vertical integration), or several firms are integrated as one to manage the supply chain (Harland 1996; Heide 1994; Landeros and Monczka 1989; Mentzer et al. 2001a; Webster 1992). Cooperative relationships are not as clearly differentiated. Although there is confusion as to the distinction among the different types of cooperative relationships, relationship structure can be broken out into

and operationalized by these three main relationship types – arms length, cooperative relationships and integration. More empirical research is needed to determine if this variable is categorical or continuous.

Much of the existing research on different cooperative relationship types (e.g., alliances or partnerships) views types as interorganizational governance structures that straddle the two ends of markets and hierarchies (Thorelli 1986). However, some authors argue a single type, such as alliances, can span a variety of structures along a continuum with varying levels of collaboration throughout its evolution (Iyer 2002). Thus, the type of relationship only explains part of the structure of a relationship. Another dimension of structure, relationship magnitude, is necessary to fully explain a portfolio of relationships.

**Relationship Magnitude**

Relationships between people, although different, are analogous to those between firms – they have different levels of intimacy or strength. The psychology literature provides some examples of the variation in intimacy (i.e., the level of association or familiarity, ranging from not very intimate to very intimate) as personal relationships progress through different types (often referred to as stages in the psychology literature). For example, McCall (1970) uses the idea of social bonding to investigate friendships. Collins, Kennedy, and Francis (1976) confirm this idea when they discuss the variation of intimacy through the stages of courtship – casual dating, going-steady, and engagement. Guerrero and Andersen (1994) discuss the evolution of relationship types through casual dating, serious dating, and marriage – each relationship having varying levels of intimacy. In an article on communication, Aune, Buller, and Aune (1996) discuss initial

interactions taking place on an impersonal level and over time becoming more personal and progressing toward greater intimacy. This occurs even if the type of relationship (e.g., a friendship) remains the same. While the formation and maintenance of interpersonal relationships are different than that of interorganizational relationships, the notion of differing levels of intimacy within one type of relationship provides support to the concept of interorganizational relationship magnitude.

Relationship magnitude is a broad term that encompasses the ideas and research concerning the strength and closeness of relationships. In the decision sciences literature on coupling (a relationship among anything that may be tied together), the relationship is described as varying in strength along a continuum from loose to tight (Beekun and Glick 2001). Donaldson and O'Toole (2000) attempt to classify relationships using relationship strength, which measures the underlying motivation guiding the relationship and the intensity of interaction between the partners. However, these authors then pigeon-hole governance structures, or types of relationships, into four total strength categories. While this discusses the notion of relationships, it does not explain the multitude of relationships that are possible, nor does it allow for strong, arm's length relationships or weak, integrated ones. Bove and Johnson (2001) review the literature on relationship strength, closeness and quality in an attempt to determine when it is appropriate to use each of them. The authors determine that the distinction is the context in which each is used, but that all three are descriptors of the *magnitude* of a relationship. In addition, the authors discuss closeness varying as a function of the type of relationship, thus conceptualizing the two as distinct constructs.

With one exception, the construct of relationship magnitude has not been directly addressed in previous research. Golicic, Foggin, and Mentzer (2003) conducted a literature search and an exploratory study that proposed relationship magnitude as a distinct component of relationship structure. They define relationship magnitude as **the degree or extent of closeness or strength of the relationship among organizations**. The authors found examples of varying levels of magnitude, although not referred to as such, within relationship types in existing research. For example, Santoro (2000) conducted research on the link between relationship magnitude and outcomes in industry-university ventures. The research was based on the notion that firms and universities cooperate through different types of relationships with varying levels of personal interaction. Birnbirg (1998) proposed that strategic alliances take a variety of differing forms depending on factors such as degree of commitment, symmetry of rewards, and degree of mutual trust. In their research on partnerships, Lambert, Emmelhainz, and Gardner (1996) distinguish among three different levels of magnitude based on the interactions and closeness. Within the type of partnership, the authors distinguish among coordination between the partners (what the authors term Type I), integration (Type II), and significant integration (Type III). Barringer and Harrison present several types of interorganizational relationships with varying degrees of linkages or coupling (2000).

The depth interviews conducted for this dissertation revealed that executives discussed levels of relationship magnitude in this manner (i.e., from distant to very close) when asked to describe some of their supplier and/or customer relationships. One interview participant responded, "*I'd like to think we have a very close relationship with [other firm], an open relationship*." Participants described feelings they had about firms

with which they have close relationships: "*You just become so close to everybody that you don't have to put forth that extra effort. You're comfortable with them. You don't have to put on a false front. You are who you are. They are who they are*." Another gave an example of close relationships with two of their suppliers, "*They attended all the family functions that we had. They ate lunch with us every day. I mean they were pretty much members of the family*." Common comments on close relationships were that the firms worked together and understood what was expected of each other and how they would both act for the good of both firms. For example, one interviewee commented, "*We've got to understand where each organization is going. In good times and in bad, we kind of support each other and I think those are the main characteristics of that relationship*." Another said, "*We really try to approach that as if we are not two companies. And we approach it as if we are one…there are equally shared risks and rewards*."

The interview participants also described distance, or a lack of closeness, in relationships they have. One stated, "*We have thousands of other customers who come and go. There's no opportunity to provide collaboration there*." Participants discussed how replaceable a supplier or customer could be if there was not a strong bond between the companies. One commented, "*We always say those carriers are as good as their last failure*." Another described how they managed relationships that were not very close: "*We could kind of lose that relationship with them so I would probably want to replace them if that should happen. So I kind of keep those relationships viable so that if we do need to change we can*."

The focus groups described in Golicic, Foggin and Mentzer (2003) also discussed the amount of closeness or magnitude in relationships when they spoke of cooperation and collaboration. The participants distinguished terms they used to describe the closeness of a relationship from those used to describe the relationship type. One participant stated, "*Very often the term collaborator and partner get confused I think in industry*." However he believed that his company could be both – they had partnerships, some of which were collaborative while some were less close than others. Another participant stated that, "*the only way you can work a collaborative partnership is if you believe in harmony*." He was referring to a particularly intense partnership with one supplier. Yet another participant described an alliance they are currently in and that, "*it's becoming a pretty close relationship*." These examples show that executives differentiate between relationship types and the levels of closeness or magnitude in the relationship.

The interviews conducted for this dissertation and the focus groups in Golicic, Foggin and Mentzer (2003) discussed different levels of magnitude within a single type of relationship. In addition, their literature examples demonstrate how a relationship takes a particular structure based on the magnitude and type of relationship between the firms. In interpersonal relationships, the level of intimacy experienced by the individuals leads to changes in the type of relationship. Similarly the level of magnitude is proposed to be related to relationship type; as magnitude varies, so does relationship type. Similar to many of the characteristics of relationships (Boyle et al. 1992), magnitude is generally highest in integration and higher in cooperative than in arms length relationships; however it may not be a consistent direct correlation.

H1: An increase in the level of relationship magnitude increases the level of relationship type.

Relationship magnitude has always existed; it just has not been recognized as a distinct component of relationship structure. It is therefore likely composed of existing relationship antecedents, of which many have been empirically studied. Mentzer et al. (2001 a and b) state that relationships vary on their levels of trust, commitment, mutual dependence, organizational compatibility, vision, leadership, and top management support; the higher the levels of these, the closer the firms are to an integrated relationship. Cannon and Perreault (1999) differentiated their types based on the characteristics of expectations of information sharing, degree to which operations are linked, contractual agreements, expectations about working together, and relationship-specific adaptations by the seller or buyer. The similar study by Rinehart et al. (2002) used trust, commitment, and the frequency of interaction. Dabholkar and Neeley (1998) categorize business-to-business relationships on temporal perspective (long-term versus short-term), goal orientation (individual gain versus joint gain), and power (balanced versus unbalanced). According to Boyle et al. (1992), types "vary in the inclusiveness of goals, the locus of decision-making, the scope of supervision and control, commitment to the system, and the formality of roles and division of labor" (p. 464); and these characteristics are thought to be highest in corporate systems or integrated relationships.

Although the above authors have considered various differentiating characteristics, there are similarities in some of the concepts. For example, some refer to actions by one or more parties, some are expectations, and some are affective or social aspects. The social aspects or affective antecedents have received some attention, but

deserve closer examination as a possible component of relationship structure. A sample of studies examining relationship antecedents is presented in Table 2.2. Relationship magnitude is considered a higher order construct composed of existing relationship antecedents and is therefore operationalized through its dimensions.

## DIMENSIONS OF RELATIONSHIP MAGNITUDE

One of the purposes of the depth interviews was to determine the components of relationship magnitude as seen by practitioners. When asked what sets a close relationship apart from a distant one, participants said, "*both sides are willing to invest into that relationship over the long term*," "*we have so galvanized ourselves to their organization*," and "*one organization cannot succeed without the input and cooperation of the other*." Not only did those interviewed speak of differing levels of magnitude in their relationships, they also specifically referred to existing relationship components when comparing those levels. Trust, commitment, and mutual dependence were each mentioned in examples in at least 50% of the interviews as the factors that distinguish the level of magnitude in a relationship.

The focus group results reported by Mentzer, Foggin, and Golicic (2000) described collaboration as requiring a higher level of trust, and that if "*the trust is not there, ... it boils back down to cooperation*" – i.e., a lower level of magnitude. They spoke of collaboration requiring honesty, integrity, and reliability. According to the focus groups, when there is lasting trust and mutual dependence, the relationship gets stronger. "*They never let us down, and we never let them down*." Another participant spoke of collaboration as "*a two-way street and I think also the other thing that underlies*

**Table 2.2**
**A Sample of Empirically Tested Relationship Antecedents**

| Antecedent(s) | Relationship Phenomena | Source |
|---|---|---|
| Trust, dependence | Intention to cooperate, intention to exert controls | Andaleeb 1995 |
| Trust, power imbalance, communications, age of relationship, negative reputation | Perceived continuity of relationship | Anderson and Weitz 1989 |
| Economic – power, price, risk, avoidance, opportunism; social – trust, commitment, cooperation, mutual dependence, equity | Relationship strength | Donaldson and O'Toole 2000 |
| Dependence, trust | Long-term orientation | Ganesan 1994 |
| Dependence, trust, commitment, communication, cooperation | Relationship marketing theory | Lewin and Johnston 1997 |
| Interdependence, conflict, trust, commitment, organizational capability, top management vision | Partnering orientation and implementation | Mentzer, Min and Zacharia 2000 |
| Attributes of the alliance (trust, commitment and interdepedence), communication behavior, conflict resolution techniques, supplier selection process | Success of the alliance | Monczka et al. 1998 |
| Trust, commitment | Acquiescence, propensity to leave, cooperation, functional conflict, uncertainty | Morgan and Hunt 1994 |
| Trust, commitment, frequency of interaction | Relationship type | Rinehart et al. 2002 |
| Quality, satisfaction, trust, dependence, commitment | Intention to stay | Wetzels, de Ruyter, and van Birgelen 1998 |
| Commitment, trust, cooperation, mutual goals, interdependence, performance satisfaction, alternatives, adaptation, nonretrievable investments, shared technology | Different relationship situations | Wilson 1995 |

*it is that it needs that personal commitment*." Another talked about the opportunities for switching, but collaboration prevents that from occurring. "*Once you make that commitment, you don't throw it away after a couple of years…you work on it…you really work through issues*."

The depth interviews and literature most frequently refer to trust, commitment and dependence when discussing the closeness of a relationship. Each of these is considered a component of intimacy in personal relationships and has been linked to social and structural bonds in buyer-seller relationships (Thibaut and Kelley 1959; Wilson 1995). They have also been considered antecedents of interorganizational relationships in both conceptual and empirical studies (for example, see Ganesan 1994; Geyskens et al. 1996; Gundlach, Achrol and Mentzer 1995; Gundlach and Cadotte 1994; Morgan and Hunt 1994). Trust and commitment are both related to a market orientation (Baker, Simpson and Siguaw 1999) and along with dependence are also components of social exchange theory and relationship marketing theory (Lewin and Johnston 1997). Lambe, Wittmann, and Spekman (2001) describe the foundations of social exchange theory – that a party in an exchange relationship compares outcomes to those available from alternatives, which determines their dependence upon the relationship. Positive outcomes over time increase the parties' trust of each other and commitment to maintaining the relationship.

The studies on relationship strength support these three dimensions as appropriate for relationship magnitude. In their study of relationship magnitude variables, Bove and Johnson (2001) deduce that relationship strength is a second order construct comprised of trust and commitment while relationship closeness is measured through the degree of mutual dependence. The authors go on to say that other relationship variables (e.g.,

satisfaction, cooperation, information, etc.) act as antecedents of these dimensions. Donaldson and O'Toole (2000) operationalize relationship strength through measures commonly used for trust, commitment and dependence. Based upon the depth interviews and support from prior research, it is proposed that trust, commitment, and dependence are dimensions of relationship magnitude.

**Trust**

One interview participant was asked what was present in a particularly close relationship that was not in others. He replied, "*Trust. Trust is the number one thing. And it's built on both of us saying I'm going to trust you. That we're going to deal with each other as if we're one company, and we're not going to screw you and you're not going to screw us. You know you said you were going to do this and this is what you did*." Another respondent said, "*I don't think you could have a close relationship without being honest*." The opposite situation was also addressed by respondents; if trust is lacking, a high level of magnitude is not possible as one participant noted, "*There's a deep seated lack of trust I think on both sides – at this point that would have to be overcome if we were ever going to change the relationship*."

Many authors have studied the role of trust in interorganizational relationships. Anderson and Weitz (1989) said that you cannot get benefits from a relationship unless you believe it will last. This relationship continuity is a function of trust, which they define as the belief that needs will be fulfilled in the future by the other party's actions. Ganesan (1994) states it is a willingness to rely on a party in whom one has confidence. A similar definition is confidence in the reliability and integrity of the other party

(Moorman, Deshpande and Zaltman 1993; Morgan and Hunt 1994). Although definitions may vary slightly, most authors operationalize trust through honesty and benevolence (Andaleeb 1995; Doney and Cannon 1997; Ganesan 1994; Wetzels, de Ruyter and van Birgelen 1998). For this dissertation, trust follows existing definitions and is defined as **the willingness to rely on an exchange partner in whom there is confidence in their honesty and benevolence**. The interviews used credibility and integrity in examples of trust. These concepts are similar to the operationalizations of honesty and benevolence found in the literature. Therefore, existing measures revised for the survey context were used.

**Commitment**

Besides trust, respondents spoke of having an understanding of expectations between firms and being able to rely on the relationship when the level of magnitude was high. An interviewee described a situation with a customer, "*Because they know we'll do [what is asked of us] – it's the nature of the relationship. That's their expectation with me and that's my expectation*." Another said to have an intense relationship, "*you know it gets down to trust, it gets down to commitment and doing what you say you're going to do.*" When discussing how strong one particular relationship was, a participant described their level of commitment, "*And when you run into the inevitable bumps in the road where on a given day we don't have as many trucks as they want, the alliance is strong enough to endure those issues that periodically crop up. Because it's in our mutual interest to work them out*."

Commitment has received a great deal of attention in the literature. Creating a close relationship requires each party to dedicate resources to the relationship and to assume risk. The willingness to make these sacrifices allows companies to realize long term benefits (Anderson and Weitz 1992). Morgan and Hunt (1994) state that commitment is a belief that the relationship is so important that it warrants maximum efforts to maintain it. It is the intention to continue the relationship (Geyskens et al. 1996). Many authors agree there are two components to commitment – attitudinal or affective commitment, which is an enduring positive regard for the other party and instrumental or calculative commitment, which is actions or investments taken that demonstrate a party's intention for the future of the relationship (Geyskens et al. 1996; Gundlach, Achrol and Mentzer 1995; Sollner 1999; Wetzels, de Ruyter and van Birgelen 1998). Commitment is thus defined as **the willingness to exert effort to continue the relationship**. Similar to prior research, examples from the interviews described positive regard and relationship-specific investments in examples of committed relationships. Therefore, commitment is operationalized by affective commitment and instrumental commitment, and existing measures for commitment were revised and used for this research.

**Dependence**

When discussing close relationships, respondents said they were careful not to take advantage of power that they might have in a given situation. They believed this would not only drive the magnitude down, but possibly end the relationship all together. "*We have the ability to compel price in the market and to the extent that we are ever*

*perceived to abuse that power, I can see where one of them would go out and try to find an alternative to us*." Companies strived to develop a mutual dependence by following through on what was expected. One participant said, "*And I think that's how you create those relationships that they can depend on you*." But dependence should not be one-way; respondents frequently spoke of both working together and mutually needing each other. "*If the two parties don't work together then I'm telling you we aren't going to be successful*."

Power and dependence have received a great deal of attention in marketing and logistics literature as antecedents to interorganizational relationships. In any dyad, both members are dependent upon the relationship to some degree. Dependence exists when one of the boundary spanners does not entirely control all of the conditions necessary for achievement of a desired outcome performed by the other party (Emerson 1962). When one party is dependent upon another, they want to continue the relationship and strive for closer relationships. However, when the party is not dependent upon the other, there is little motivation to develop a strong cooperative relationship (Ganesan 1994). These ideas are often measured through importance, the number and attractiveness of alternatives, and switching, (Andaleeb 1995; Ganesan 1994; Gundlach and Cadotte 1994; Heide and John 1988; Wetzles, de Ruyter and van Birgelen 1998). For the purpose of this dissertation, dependence is **the perception of the need for one party to maintain the relationship to achieve desired goals** (Frazier 1983). It was operationalized through the perception of alternative sources of exchange, the ease of switching and the general need for exchange with the other party.

Many of the conceptual and empirical studies cited in this section have found relationships among two or all three magnitude dimensions – trust, commitment, and dependence – in their research. For example, Morgan and Hunt (1994) and Movando and Rodrigo (2001) found a positive relationship between trust and commitment. A positive relationship between trust and mutual dependence was supported by Ganesan (1994). Monczka et al. (1998) conceptualize all three as attributes of a relationship. Trust, commitment, and mutual depedence are found to all be empirically related by Geyskens et al. (1996); Kumar, Scheer and Steenkamp (1995); and Wetzels, de Ruyter and van Birgelen (1998).

**SITUATIONAL DRIVERS**

Actions are driven by motivation – generally based on a belief that a certain outcome will result from the action (Vroom 1964). For firms to develop a particular level of relationship magnitude, something must motivate or drive them to put forth the time and effort into the relationship. In the business-to-business context, it is the business situation that firms experience that drives them to determine whether they will enter a close relationship or maintain distance. Factors that are antecedent to the type of relationship have been researched as have antecedents to the dimensions of relationship magnitude (for example, see Cannon and Perreault 1999; Doney and Cannon 1997; Ganesan 1994; Geyskens et al. 1996; Heide and John 1990; Morgan and Hunt 1994; Sriram, Krapfel and Spekman 1992). However, because relationship magnitude has received little direct attention, drivers of magnitude have not been studied either.

In the depth interviews, informants were asked what drives them to develop or change particular relationships to closer or more distant relationships. Twelve different drivers were mentioned, which include shared strategies with the other firm, the desire for resources and capabilities, the importance of the other firm, current performance of the other firm, particular characteristics of the other firm, the nature of the business environment, financial reasons, interpersonal compatibility, the desire to solve a particular problem, history with the other firm, the status of relationships with other firms, and a change in goals. For the purpose of testing the theoretical model in this dissertation and to keep the research manageable, only the top three drivers were considered. The rest were left for future research. Performance, shared strategies or strategy congruence, and the desire for resources or capability congruence, were independently mentioned most frequently by those interviewed. Performance is also an outcome of relationships; therefore, this driver was left for future, longitudinal research. The next most frequently mentioned driver was the importance of the other firm.

**Strategy Congruence**

Several of the interview respondents discussed strategies and goals when they talked about developing or changing the level of magnitude of an interorganizational relationship. When determining how close a relationship should be, one informant said they try to "*understand the philosophies of the client, and match ours – how do we work together and those kinds of issues*." The respondents often cited a match or fit between the two companies' strategies would drive them to building a closer relationship. An informant stated that a closer relationship is "*related to a customer's goals and your*

*goals kind of lining up*." Another interviewee said, "*It has everything to do with their strategy*." He went on to describe situations where they would keep other firms at a distance because they were "*unwilling to articulate what their strategy was*."

The literature briefly discusses this idea as well. Krapfel, Salmond and Spekman (1991) proposed that the higher the level of interest commonality, the closer the relationship that will result. The authors define interest commonality as one party's goals and their perception of the other party's goals. When the goals are compatible, interest commonality is high. Anderson and Weitz (1989) tested a positive relationship between a similar construct, goal congruence, and trust and found support for this relationship. In an attempt to fill a gap concerning the effects of strategy on a firm's relationships with other firms, Lassar and Kerr (1996) argue that the unprecedented numbers of organizations entering closer relationships represent increasing pressure to maintain congruence between strategy and internal structure. They state that this pressure is likely to require a similar fit between strategy when structuring external relationships. Strategy congruence, or **the perception of the match between the two parties' strategies**, therefore, is a driver of the level of relationship magnitude.

H2a: An increase in the level of strategy congruence increases the level of relationship magnitude.

**Capability Congruence**

Another driver of magnitude is the desire or need for resources and capabilities that another firm has. The match between a need for a capability and the fulfillment through a relationship with a firm that has the capability motivates one or both firms to

pursue a closer relationship. One interview informant was asked why they had chosen to develop a close relationship with one of their suppliers, and she responded that the supplier had the capabilities to provide materials in the way her firm desired. The supplier also had systems capabilities that were important to her firm. Another interviewee echoed these thoughts when he said that developing a relationship with another firm would be based on their experience with that firm and "*they have the resources that they can take care of us*." A respondent was asked what it would take to develop a closer relationship with an existing supplier and he responded, "*We go through the evaluation of their capabilities*."

There is much support in the literature for this situational driver. Resource dependence theory posits that when resources and competencies are not readily or sufficiently available, firms are likely to establish ties with other organizations (Child and Faulkner 1998). As most firms cannot develop all capabilities needed internally, developing an interorganizational relationship is one way for firms to obtain these resources and is often the most practical. Relationships enable firms to take advantage of complementary assets and to reduce redundancy (Dyer and Singh 1998). The more capabilities a firm needs, the more likely they are to look to building a closer relationship with the firm(s) that can provide them. When two firms find a match between their needs and the capabilities of the other firm, they will strive to obtain synergies from the shared capabilities. Therefore, capability congruence, or **the perception of a match between the capabilities and needs of the two parties**, is a driver of relationship magnitude.

H2b: An increase in the level of capability congruence increases the level of relationship magnitude.

**Importance**

The perceived importance, discussed as the frequency or volume of business, of a supplier or customer is seen as a driver of relationship magnitude. If a firm is perceived to be a high percentage of business to their customer or supplier, the customer or supplier believes they will benefit from developing a closer relationship with the firm. One informant from the interviews was asked how they decide with which supply chain relationships they put more effort. *"I think it's just the amount of business we have [with the other party]."* Another echoed this when they commented, *"Well a lot has to do with volume."* Conversely, some firms purposely keep the amount of business done with certain parties at a lower level. One interviewee said, *"We don't have anybody that has over 10% of our business in one individual account."* These firms want to control their interactions and the level of magnitude with particular suppliers or customers, often desiring more distance between themselves and their supplier or customer.

There is support for importance as a relationship driver in the literature; it has been empirically tested in prior studies on interorganizational relationships. Heide and John (1990) found that joint action, a move toward closer relationships, is more likely to occur in more important relationships as reflected by the size or amount of purchases. Sriram, Krapfel and Spekman (1992) found a positive relationship between the importance of the transaction and buyer dependence in buyer-seller relationships. Importance for this dissertation is defined as **the perception of the significance of one party by the other party in the relationship** and is a driver of magnitude.

H2c: An increase in the level of importance increases the level of relationship magnitude.

**RELATIONSHIP VALUE**

There is agreement in the literature that value is an outcome of the structure or type of relationship (for example see Barringer and Harrison 2000; Nevin 1995; Nooteboom 1999; Stern, El-Ansary, and Coughlan 1996). Doz and Hamel state that interorganizational relationships help firms create value by sharing resources, sharing knowledge, and gaining access to markets (1998). There are other, similar consequences of relationships that have been studied, i.e., quality and satisfaction. In order to distinguish among these outcomes, the interview participants were asked to describe the value they receive from their various relationship structures.

When asked about value, interview respondents provided several examples of benefits and costs that are considered in their evaluation. Interviewees described benefits such as increased business, higher efficiencies, better visibility, decreased inventory, higher responsiveness, allocation priority, and the sharing of knowledge from both the magnitude and type of relationship. Many of the benefits mentioned were "soft" and described as a general feeling of comfort. When speaking of a close partnership one participant said, "*I don't have to worry about their deliveries. I don't have to worry about their lead times. I don't have to worry about the pricing*." Another stated, "*I think that naturally you have to spend less time and effort and save more dollars policing them*."

Not all agreed that you spend less time and effort on closer relationships. Some cited this as a cost along with the commitment of additional resources, the decrease of leverage over the other party, information security, and other risks. One respondent admitted, "*The truth is I can't afford in terms of my time and the time of my team to engage all of those customers and try to grow them into a close relationship. So its not in our interest to do that*." Some however stated that they did not feel there were any costs involved in their higher levels of relationships; they only received benefits. Many of those interviewed said that they do get value from relationships that are not cooperative or close in that arms-length relationships cover their costs. One interviewee mentioned that they do not get the most value from their closest alliance but from what he considered to be a lower level of relationship: "*Well actually the customer that we get the most value from is one of the two partnerships that I referred to*." So while practitioners consider the tradeoff between benefits and costs when evaluating their different relationships, there is not necessarily a positive correlation between value and the structure of the relationship.

While the firms involved in the interviews considered the value of relationships, it was not necessarily measured. Some of the respondents provided examples of measures used to quantify the benefits and/or costs that they considered in their perception of value. These measures were examined during data analysis in an attempt to recommend financial metrics for the value of a relationship and are presented in the final discussion in Chapter 5.

The results of the interviews showed that practitioners in business-to-business relationships view value much the same as consumers do. In the consumer behavior

literature, Zeithaml (1988) presents an exploratory study with consumers in which they define value and differentiate it from quality. Value is defined by consumers as whatever I want in a product, what I get for the price I pay, and what I get for what I give (pg. 13). The author summarizes these into an overall assessment of the utility of a product based on perceptions of what is received and what is given. Quality is defined as a judgment of overall excellence or superiority. Value therefore differs from quality in that it is more individualistic and personal, and it involves a tradeoff. Quality therefore may be a dimension considered in the evaluation of value. Monroe's definition of value, an evaluation of the benefits received versus the costs that were paid to obtain the benefits, is a tradeoff of get and give as well (1990).

In the business-to-business literature, Gassenheimer, Houston and Davis discuss relationships as patterns of purposeful behavior that satisfy needs through the exchange of economic and social value (1998). In their study of logistics value, Novack, Langley and Rinehart (1996) discuss satisfaction as the result of value creation with quality antecedent to it. The authors also define value as a trade-off between a customer's evaluation of the benefits and its costs. These both agree with the assessment of satisfaction by Lambe, Wittmann and Spekman (2001) – that it serves as a measure of a firm's view of the outcomes of the relationship. Relationship value, defined for this dissertation as **the perception of benefits received versus costs sacrificed from the relationship**, is therefore not only a consequence of relationships, but is proposed to be a direct outcome of the structure of the relationship. As structure is comprised of the relationship type with magnitude antecedent to it, value is a direct consequence of type, which then mediates the relationship between magnitude and value. Intuitively, this

relationship should be a positive one; however, because firms do not always purposefully structure their relationships or measure the value of their relationships, it is unknown if the relationship will be consistent and is left for testing to determine the direction.

H3: A change in the level of relationship type changes the level of relationship value.

## SUMMARY

This chapter provided the theoretical justification from which the relationship structure model was deduced. The theoretical justification was based on a review of business-to-business relationship, personal relationship, performance measurement, and satisfaction literature from various disciplines. The literature review in Chapters 1 and 2 and the qualitative research together provide antecedent justification for each of the constructs and their associated relationships that comprised the relationship structure model.

The constructs that comprise the relationship structure model are: relationship type, relationship magnitude, trust, commitment, dependence, strategy congruence, capability congruence, performance, and relationship value. Five research hypotheses that represent the relationships between the model constructs were presented and are summarized below:

H1: An increase in the level of relationship magnitude increases the level of relationship type.

H2a: An increase in the level of strategy congruence increases the level of relationship magnitude.

H2b: An increase in the level of capability congruence increases the level of relationship magnitude.

H2c: An increase in the level of importance increases the level of relationship magnitude.

H3: A change in the level of relationship type changes the level of relationship value.

The definitions and operationalizations for each construct are summarized in Table 2.3.

The following chapter describes the methodology used to test the research hypotheses.

**Table 2.3**
**Summary Of Construct Definitions And Operationalizations**

| Construct | Definition | Operationalization |
|---|---|---|
| Relationship type | the group or class of relationships that share common traits or characteristics | perceptions of the characteristics of the relationship |
| Relationship Magnitude | the extent or degree of closeness or strength of the relationship among organizations | dimensions of trust, commitment, and dependence |
| Trust | the willingness to rely on an exchange partner in whom there is confidence of their honesty and benevolence | perceptions of honesty and benevolence |
| Commitment | the willingness to exert effort to continue the relationship | perceptions of positive regard and relationship specific investments |
| Dependence | the perception of the need of one party for the other to achieve desired goals | perception of alternatives and ease of switching |
| Strategy Congruence | the perception of the match between the strategies of the two parties | perception of the match of one company's strategy with the strategy of the other |
| Capability Congruence | the perception of a match between the capabilities and needs of the two parties | perception of the match of one company's capabilities with the needs of the other |
| Importance | the perception of the significance of one party by the other party in the relationship | perception of the amount of business one party brings to the other |
| Relationship Value | the perception of benefits received versus costs sacrificed from the relationship | perceived benefits and costs from the relationship |

# CHAPTER 3 – TESTING THE THEORY

The purpose of this chapter is to explain the research methodology for testing the theory developed in this dissertation. One goal of the research was to create and test new measures for several of the constructs in the theory. Another was to test the hypotheses that were generated based on the research questions concerning the interrelationships among the variables that comprise the relationship structure model. This test of the hypotheses, and therefore the theoretical structure, was to determine the nomological validity of the model and each of its component parts. Due to the covariate nature of the relationship structure model, structural equation modeling (SEM) was considered an appropriate technique to evaluate the research hypotheses (Loehlin 1998). SEM offers many advantages over other statistical techniques such as accounting for measurement error in latent variables when estimating path relationships between latent variables. In addition, SEM is ideal for comparing rival theoretical models (Garver and Mentzer 1999).

This chapter is organized into six sections. Following this introduction, the theoretical model is presented again as a structural equation model consisting only of latent variables that were measured as part of this research. The third section describes the research design, including the sample. The development of measures is discussed in the fourth section, including details on the pretest and purification of the measures for the final survey. Finally, details on the final collection and analysis of data using the software tool, AMOS 4.01 are presented followed by a summary of the methodology.

## STRUCTURAL EQUATION MODEL

This section provides the theoretical relationship structure model presented in Chapter 2 in the form of a structural equation model. The relationship structure structural equation model (RSSEM), presented in Figure 3.1, consists of three exogenous (independent) variables and five endogenous (dependent) variables. The exogenous variables are strategy congruence ($\xi 1$), capabilities congruence ($\xi 2$), and importance ($\xi 3$). The endogenous variables are trust ($\eta 1$), commitment ($\eta 2$), dependence ($\eta 3$), relationship type ($\eta 4$), and relationship value ($\eta 6$). The construct of relationship magnitude is a second order construct composed of the first order constructs of trust, commitment and dependence. The second order factor is an attempt to explain the covariation of the first order factors in a more parsimonious way (Marsh and Hocevar 1985).

The nomological network for the relationship structure model is represented by the directional paths shown in the figure and the five total research hypotheses presented in Chapter 2. These hypotheses are summarized below:

H1: An increase in the level of relationship magnitude increases the level of relationship type.

H2a: An increase in the level of strategy congruence increases the level of relationship magnitude.

H2b: An increase in the level of capability congruence increases the level of relationship magnitude.

H2c: An increase in the level of importance increases the level of relationship magnitude.

H3: A change in the level of relationship type changes the level of relationship value.

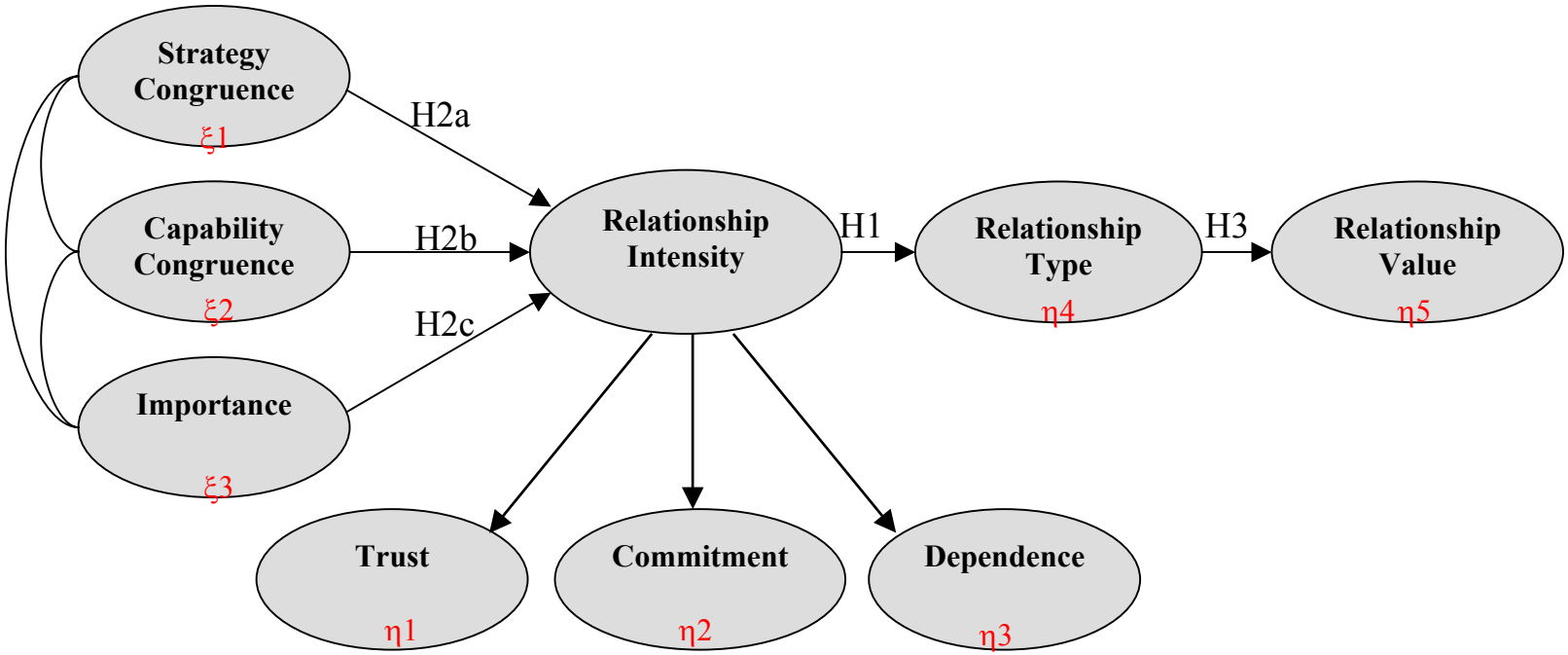



**Figure 3.1**
**Relationship Structure Structural Equation Model (RSSEM)**

## RESEARCH DESIGN

This dissertation used a nonexperimental mail survey methodology (Kerlinger and Lee 2000) to gather the data necessary to test the model and its hypotheses. A survey research design was considered appropriate for this dissertation for the following reasons: 1) survey research has an advantage when collecting perceptual data from a large population; 2) survey data are easily quantifiable and amenable to SEM; and 3) survey research allows the use of existing measures developed in previous survey research. Extension of prior research is an important aspect of research and is an objective of this dissertation.

The unit of analysis is the respondent's perception of the interorganizational relationship between their firm and a transportation provider. The targeted respondents are those individuals directly involved with the management of the formation and/or maintenance of the relationship. All of the variables of interest are assessed through the respondents' perceptual evaluations. More details on the survey sample and instrument follow.

### Sample

The sample for the survey was taken from customers (or shippers) of the transportation industry (or carriers). The nature of the industry is that shippers have access to a wide variety of providers; some may be considered core carriers while others are only used on an as-needed basis. Shippers therefore manage a portfolio of various relationships with their carriers. The constructs of interest were thus all expected to be present in varying degrees. In an effort to achieve a moderate level of external validity

(Cook and Campbell 1979) and striving for a modest level of generalizibility, a range of customers from various industries was sampled. In addition, both trucking and intermodal modes of transportation were considered for the focal relationship. Survey recipients represented various levels of management within their companies in order to capture any differences in how different levels view the relationships.

**Measure Development**

In accordance with the mail survey methodology (Dillman 2000), appropriate measures are necessary to tap latent variables. Some of the theoretical constructs use existing measures adapted for this research context. New measures were developed for others. The overall methodology for new scale development followed the procedures recommended by Churchill (1979), Anderson and Gerbing (1991), and Mentzer and Flint (1997). Existing and modified scales followed this procedure as well. The scale development process is outlined below, and each step is discussed in more detail.

1. Define the variable using the extant literature and in-depth interviews.
2. Develop items that tap the definition of each variable.
3. Gather data to pretest the scale.
4. Purify the scale (reliability and validity).
5. Collect data.
6. Assess reliability and validity.

**Construct Definition and Item Creation**

Variable definitions were created or refined based on an iterative process consisting of experience, reviews of existing literature, and the in-depth interviews conducted as part of the theory building phase of this research. The definitions were provided in Table 2.3. The constructs must consist of 3-5 items in order to effectively tap the dimensions of the construct and analyze them using structural equation modeling (Anderson and Gerbing 1988). Therefore, 5-7 initial items were developed in anticipation of dropping those that did not contribute to convergent and discriminant validity. The existing measures used in this study were all empirically tested using a seven point scale from strongly agree (7) to strongly disagree (1) on the survey. Many empirical studies on interorganizational relationships utilize this same scale to measure the constructs of interest (for example see Anderson and Weitz 1989; Geyskens et al. 1996; Heide and John 1992). Therefore, a seven point scale was used for all measures in this survey for consistency.

Trust, commitment, dependence and relationship type all had some existing measures that were appropriate and were used for the survey instrument. The remaining variables that were the focus of the qualitative research – strategy congruence, capabilities congruence, importance, and relationship value – did not have existing scales that would be applicable to the theory. Therefore, new scales were developed for these variables using the data from the depth interviews. Each of the items tap the definitions that were created using terms used by those interviewed. Example measures for each construct are summarized in the following sections while the complete pretest instrument is included in Appendix B.

*Relationship Type (Items C20-C26)*

Relationship type is the group or class of relationships that share common governance characteristics; they range from arms length to integration with cooperative relationships in the middle. Different relationship types have some existing measures and descriptions in the literature. Existing measures for relationalism from Boyle et al. (1992) seemed appropriate for this research and achieved adequate levels of reliability and validity in their study. New items were created to supplement these in order to more fully tap the construct definition. Sample items are as follows.

- The business relationship my firm has with the transportation provider could better be described as "cooperative" rather than "arm's length."
- The business relationship my firm has with the transportation provider could better be described as "integrated" rather than "cooperative."
- My firm's relationship with the transportation provider is more than just repeat transactions.

*Relationship Magnitude*

Relationship magnitude is a second order construct. It was measured through its dimensions of trust, commitment and dependence. The measures for each of these first order constructs were averaged to form construct scores, and these scores were used as the measures for relationship magnitude. To accomplish this, decisions were made on the items following the pretest in order to use the same number of items for each of the three dimensions. Existing measures from Morgan and Hunt (1995) were used for trust and

commitment; these authors empirically tested these two constructs and the relationship between them. The authors also sampled customers and used structural equation modeling to analyze their data. The reported reliabilities for the two measures were .949 and .895 respectively. Therefore, these measures were applicable to this study. As Morgan and Hunt did not study dependence, items for this were taken from Ganesan (1994) and Rinehart et al. (2002). Ganesan achieved a reliability (Cronbach's alpha) of .94 for his retailer dependence items.

*Trust (Items C1-C7)*

As the interviews described trust through reliability and integrity, trust here was operationalized as was common in many empirical studies - through honesty and benevolence. Representative items from Morgan and Hunt (1995) are listed below.

- In our relationship, the transportation provider has high integrity.
- In our relationship, the transportation provider can be counted on to do what is right.
- In our relationship, the transportation provider treats my firm fairly and justly.

*Commitment (Items C8-C13)*

Those interviewed described commitment as a positive regard along with an investment in the relationship. This is described in the literature as affective and instrumental commitment and was operationalized for this dissertation as such. Sample items that were used for the survey follow. (Note: The Morgan and Hunt item on

replacement of the provider was not used as replacement with an alternative was considered part of dependence).

- The relationship my firm has with the transportation provider is something we are very committed to.
- The relationship my firm has with the transportation provider is something my firm intends to maintain indefinitely.
- The relationship my firm has with the transportation provider deserves our firm's maximum effort to maintain.

*Dependence (Items C14-C19)*

An important piece of relationships as discussed by the interview participants is the perception that one party is needed by the other in order to succeed. This is described in the literature through the attractiveness of alternatives and switching. Sample items from Ganesan (1994) are listed below.

- My firm could easily replace the transportation provider.
- My firm does not have a good alternative for the transportation provider.
- The transportation provider is crucial to my firm's future success.

*Strategy Congruence (Items C27-C31)*

Strategy congruence is the perception of the match between the strategies of the two parties. Those interviewed described this as a fit or match between business philosophies and goals. Sample items included the following.

- My firm and the transportation provider have common goals.
- There is a match between my firm's business philosophies and that of the transportation provider.
- The transportation provider has a business strategy that is very different from my firm's.

*Capability Congruence (Items C32-C36)*

Capability congruence is the perception of a match between the capabilities and needs of the two parties. Interviewees spoke of the need for resources and capabilities that certain suppliers or customers could fill. The following represent survey items for this construct.

- The transportation provider has the capabilities that my firm needs.
- My firm sometimes has trouble obtaining the resources we need from the transportation provider.
- The provider does not bring any unique capabilities to my firm.

*Importance (Items C37-C41)*

Importance is the perception of the significance of the business one party has with the other party. Those interviewed described this in terms of the volume or frequency of exchange between the two. Sample items for this construct are listed below.

- My firm does a great deal of business with the transportation provider.

- The transportation provider carries a relatively large percentage of my firm's freight.
- My firm does not use the transportation provider often.

*Relationship Value (Items C42-C46)*

Relationship value is the perception of benefits received versus costs sacrificed from the relationship. Interviewees provided examples of how they perceived value in their relationships – through benefits and costs. Representative survey items were as follows.

- My firm receives a great deal of benefits from the relationship with the transportation provider.
- The costs to my firm for the relationship with the transportation provider do not justify the benefits we receive.
- My firm receives more benefits from the relationship with the transportation provider than costs put into the relationship.

**Survey Pretest**

A pretest was conducted in order to validate the measures created and adapted for this research. Experts in interorganizational relationship research and survey design reviewed the draft survey instrument for readability and item clarity. This process provided support for the face validity of the measures. The pretest instrument had a total of 46 items along with 8 additional questions to obtain information on the amount of

experience with the relationship, amount of business conducted with the particular partner, position within the supply chain, industry and revenue.

The pretest survey implementation followed the five step process recommended by Dillman (2000). A transportation provider supplied the primary researcher with a list of 55 customer contacts that met the sample requirements. The same instrument was also pretested with 41 employees from the transportation provider. The first step involved an initial contact via telephone to notify the pretest sample of the survey and its ensuing delivery. Two of the contacts were unreachable and therefore removed from the sample list. All participants were assured that their responses were confidential. Two incentives were offered to each survey recipient for their participation: 1) an executive summary of the results if requested, and 2) a $100 donation to the charity of choice for five randomly selected survey respondents.

The second step was to send the survey to the sample with a letter describing the importance of the research and requesting their participation. Each contact was sent one of three versions of the survey in order to ensure variation in the responses. The version that each respondent received -- 1) a good relationship, 2) an average (not particularly good or bad) relationship, or 3) a poor relationship -- was determined randomly, and each survey was given a unique identification number to track responses for subsequent reminders. A follow-up postcard was sent a week after the survey to remind the participants to complete and return the survey; this was the third step.

After allowing approximately three weeks for the first wave, in which 65 completed surveys (29 of which were customer surveys) were returned, the fourth step was taken which included sending another letter and replacement survey to those that had

not yet responded. Sixteen more surveys (11 of which were customer surveys) were returned for an overall response rate of 86% (75.4% customers). The final step was a follow-up telephone call to determine the status of response and/or to collect nonresponse information.

*Customer Respondent Characteristics*

The customer respondents represented the consumer packaged goods (25%), automotive (14%), apparel (9%), industrial products (6%) and other industries with a wide range of sales revenue ($1 million to greater than $1 billion). Half of the respondents were from manufacturing firms, with 25% from retailers and 21% distributors. To ensure the respondent dealt with a portfolio of relationships, they were asked how many providers their firm used. Forty percent used 21 or more providers, 38% used between 6 and 20, and the rest used 5 or less. This is a good indication that the majority of firms manage a large number of relationships. The respondents were asked how long they personally and their firm have used the provider to transport their freight. Greater than 75% had more than a year of firm and personal experience dealing with the specific provider to which the survey referred.

*Customer Descriptive Statistics*

The descriptive statistics for the pretest are provided in Appendix C. The results show that the item results were considered to be normal. The means for the positively phrased items tended to be between 4 and 5 while those that were negatively worded had means between 2 and 3. Nearly every item obtained the full range of answers (from 1 to

7). Standard deviations for all items ranged from 1.062 to 1.931. There were three items with a moderate kurtosis (the highest is highlighted in Appendix C); however these values were not high enough to be a concern.

*Limitations*

It is acknowledged that two primary limitations of mail surveys are the potential incidence of nonresponse and false reporting biases. However, the mail survey was preferred since a larger sample could potentially be reached in a shorter time period at a lower cost. Due to the threat of nonresponse bias on the internal validity of mailed survey research, the Armstrong and Overton (1977) method of examining differences between waves of the survey responses was utilized. All items from the customer survey were compared, and significant differences were found for two of the items (C15 and C23). As there were no differences for the other 44 items or any of the demographic data, this provided support that nonresponse bias was not an issue. The method recommended by Mentzer and Flint (1997) of examining differences between actual survey respondents and nonrespondents was not utilized in the pretest as there were only 14 total nonrespondents.

There is no efficient method to evaluate response accuracy. As specific relationship manager contacts were obtained, the perceptions of the respondents were expected to be appropriate for the relationship structure model; therefore no other plan existed to address this issue.

**Scale Purification**

Purification included tests for unidimensionality, internal consistency, reliability, and construct validity consisting of convergent validity and discriminant validity following the procedures described by Garver and Mentzer (1999). The theoretical model contained one higher order construct and, as a result, initial purification steps evaluated the model sub-scales. Exploratory factor analysis (EFA) found eleven factors to explain the variance in the data while only eight constructs were hypothesized. Unidimensionality tests run on the individual constructs uncovered seven items that loaded poorly (less than 0.50) and contributed to the additional factors. These tests are shown in Appendix C. C4 and C13 were removed; these items were negatively phrased and seemed to cause confusion for the respondents ("In our relationship, the provider cannot be trusted at times," and "The relationship my firm has with the provider could be ended with very little effort"). C23 was poorly phrased and thus removed – it seemed to relate more to the commitment construct than the type construct ("My firm feels little obligation to use the provider for further transactions"). C34 and C44 were removed because they were too broad for the construct they were intended to measure ("My firm and the provider often share our resources with each other," and "My firm puts too much time and effort into the relationship with the provider"). C14 and C17 were retained for further testing; these items pertained to the attractiveness of alternatives and have been used in other studies to fully tap the definition of dependence (e.g., Ganesan 1994).

Unidimensionality tests were then conducted on all possible construct pairs. This resulted in eight items that cross-loaded or poorly loaded on their constructs. Two of the items were removed due to the confusion of their negative wording (C7 – "In our

relationship, the provider does not show my firm enough consideration", and C19 – "My firm does not depend on the service of the provider"). One item seemed to relate more to commitment than to the type of relationship (C20 – "The continuation of the relationship with the provider is important to this firm"). The remaining five were retained, however, to ensure there were an adequate number of items to tap construct definitions (C14, C17, C24, C31, and C42). These received extra attention in final data analysis.

Confirmatory factor analysis (CFA) was then run using the eight theoretical factors consisting of the 38 remaining items, and 69% of the variance was explained. These results are shown in Appendix C. The yellow numbers highlight the appropriate factor loadings while the green shows cross-loadings. Factor loadings are also summarized in Table 3.1. The primary loading concerns were with the dependence, type, strategy congruence, capability congruence and value constructs (with the five 'concern items' removed, the CFA provided evidence of unidimensionality as the remaining 33 items appropriately loaded on their constructs).

Reliability of the scales was determined in three ways. Coefficient alpha was calculated for each scale and is shown in Appendix C. For trust, commitment, type, and capability congruence, alpha was greater than 0.700. However, since coefficient alpha tends to underestimate scale reliability, the SEM scale reliability and variance extracted were calculated as well using formulae provided by Garver and Mentzer (1999). The results are provided in Appendix C and summarized in Table 3.2. The scale reliability for each construct was greater than the acceptable value of .70. The variance shows there could be reliability issues for the dependence, type, and strategy congruence constructs.

**Table 3.1**
**Exploratory Factor Analysis Loadings**

| | Val/Ccon | Trust | Commit | Import | SCon | Depend | Type | 8 |
|---|---|---|---|---|---|---|---|---|
| C1 | | .768 | | | | | | |
| C2 | | .868 | | | | | | |
| C3 | | .841 | | | | | | |
| C5 | | .701 | | | | | | |
| C6 | | .598 | | | | | | |
| C8 | | | .547 | | | | | |
| C9 | | | .475 | | | | | |
| C10 | | | .624 | | | | | |
| C11 | | | .654 | | | | | |
| C12 | | | .710 | | | | | |
| C14 | | | | | | .479 | | |
| C15 | | | | | | 1.027 | | |
| C16 | | | .605 | | | .355 | | |
| C17 | | | .673 | | | | | |
| C18 | | | | | | .474 | | |
| C21 | | | | | | | | .584 |
| C22 | | | | | | | .517 | |
| C24 | | | | | .830 | | | |
| C25 | | | | | | | .209 | |
| C26 | | | | | | | .909 | |
| C27 | | | | | .782 | | | |
| C28 | | | | | .577 | | | |
| C29 | | | | | .512 | | | |
| C30 | | | | | .437 | | | |
| C31 | | | | | .329 | | | |
| C32 | .800 | | | | | | | |
| C33 | .654 | | | | | | | |
| C35 | .567 | | | | | | | |
| C36 | .346 | | | | | | | .456 |
| C37 | | | | .916 | | | | |
| C38 | | | | .780 | | | | |
| C39 | | | | .911 | | | | |
| C40 | | | | .677 | | | | |
| C41 | | | | .518 | | | | |
| C42 | .409 | | | .415 | | | | |
| C43 | .846 | | | | | | | |
| C45 | .745 | | | | | | | |
| C46 | .600 | | | | | | | |

**Table 3.2**
**Summary of Scale Reliability Results**

| Construct | Items / Unidimensionality | Coefficient Alpha (> 0.70) | Construct Reliability (>0.70) | Variance Extracted (>0.50) |
|---|---|---|---|---|
| Trust | 5>0.66 | .9224 | .926 | .716 |
| Commitment | 5>0.70 | .9093 | .909 | .667 |
| Dependence | 3>0.56<br>2<0.50 | .4863 | .749 | .400 |
| Type | 5>0.51 | .7714 | .766 | .399 |
| Strategy Congruence | 5>0.51 | .0744 | .783 | .424 |
| Capability Congruence | 4>0.59 | .7200 | .799 | .501 |
| Importance | 5>0.60 | .4899 | .850 | .537 |
| Value | 4>0.76 | .1672 | .887 | .665 |

Construct validity was determined through both convergent and discriminant validity. Predictive validity was not tested for the pretest sample due to its small size (testing for this was done through the full structural model). The significance of the overall factor loadings could not be tested due to the small sample size. However, the individual factor loadings were significant to .05 with the exception of value. The magnitude, direction, and statistical significance of the estimated parameter loadings were also used to assess convergent validity and are shown in Appendix C. The magnitude of twenty four items was greater than .70, with another seven greater than .60, and five greater than .50. The remaining two items below .50 were C14 and C17. The direction of all estimated parameters was appropriate for the wording of the item, and all but C14 were statistically significant. Convergent validity was therefore supported for trust and commitment items. There was partial support for strategy congruence, capability congruence, importance and value. Once again dependence and type presented some concern that was examined further in the final survey.

Paired construct correlation comparisons were conducted to support discriminant validity as suggested by Garver and Mentzer (1999). The difference in the chi-square values and degrees of freedom between a model allowing the two constructs to correlate freely and a model constraining the correlation to 1.0 was determined using AMOS and compared to a chi-square table. The chi-square difference tests are reported in Appendix C. As expected from the reliability and convergent validity results due to the five 'concern items,' there were discrimination issues between the following pairs: commitment and dependence (C14 and C17), dependence (C14 and C17) and type (C24), strategy congruence (C31) and type (C24), and capability congruence and value (C42).

Again, even though the methodological analyses supported the removal of these problem items, they were retained for theoretical reasons.

The final survey instrument showing the items that were removed and demographic questions that were added for additional information can be found in Appendix D. It was anticipated that the larger sample used for the survey would provide better support for reliability and validity of the theoretical model, and the five 'concern items' received a great deal of attention in the Chapter 4 analysis.

## DATA COLLECTION AND ANALYSIS

Once the survey instrument was deemed acceptable through the pretest, the survey was mailed to the final sample following the same five-step process as described previously in the Survey Pretest section. Ten major transportation providers were each asked for customer contacts within various industries. Only four agreed to provide contact to their customers, and the researcher was given 92 total customer contacts. In addition, a sample of 544 was drawn from the membership list of the National Industrial Transportation League (one contact per shipping firm), an organization for shippers, to supplement the total sample (636). Aside from the item changes made due to purification, only one change was made to the format of the survey. In addition to asking the respondents to think about a particularly good or bad relationship (the 'average relationship' version was eliminated due to no differences between the responses to this version and the 'good relationship' version), wording was added to reflect the possibility that a respondent may only be responsible for one relationship and that this was the relationship they were to focus on for the survey.

Hoyle (1995) defined SEM as a comprehensive statistical approach to testing hypotheses about relations among observed and latent variables. SEM was used because of its capability to test the directional relations among variables used in the equation. The RSSEM and research hypotheses were evaluated using Anderson and Gerbing's (1988) two-step approach supported by AMOS modeling software. The measurement model specifies the relations of the observed measures to their posited underlying constructs to one another. Analysis of the measurement model provides a confirmatory assessment of reliability and construct validity. The test of the structural model then constitutes a confirmatory assessment of nomological validity. In addition three nested models – the theoretical model ($M_t$), a null structural submodel ($M_n$) in which all parameters relating the constructs to one another are fixed at zero, and a saturated structural submodel ($M_s$) in which all possible parameters relating the constructs to one another are estimated – were analyzed to assess the fit of the theoretical model.

SEM does not have a single statistical test of model strength, and some are better than others depending on sample size and their assumptions (Marsh 1994; Rigdon 1996). Therefore, a number of goodness-of-fit measures are used in combination to assess the overall fit, comparative fit to the null model, and model parsimony (Hair et al. 1998). The first test of overall fit is the significance and magnitude of the hypothesized paths, which are central to the theory. In addition, the significance of the chi-square statistic and the root mean square error of approximation (RMSEA), both of which determine the degree to which the model predicts the observed covariance matrix, were examined. The significance level of the chi-square statistic should be greater than 0.05 to reject the null hypothesis that the actual and predicted matrices are different, and the RMSEA needed to

be between .05 and .08 to be acceptable (Hair et al. 1998). The comparative fit index (CFI) and Tucker-Lewis Index (TLI) were used to compare the model fit to that of the null model. Both of these values are recommended to be greater than .90 (Hair et al. 1998). To assess model parsimony, the normed chi-square adjusted for the degrees of freedom (CMIN) along with the parsimonious normed fit index (PNFI) were reported. The CMIN should have a value of less than 3.0 to be acceptable, while the PNFI should have higher values (Hair et al. 1998). All of these measures were chosen due to their frequent use in SEM and their appropriateness for use with larger samples (Marsh 1994). In addition, the target coefficient, which is the ratio of the chi-square of the first order model ($M_f$) to the chi-square of the theoretical model ($M_t$), helped determine if the second order model was a more parsimonious explanation of the theory (Marsh and Hocevar 1985). These results are all discussed in Chapter 4.

## SUMMARY

The theoretical model presented in Chapter 2 was tested using a mail survey and analyzed using structural equation modeling. This chapter presented information on this methodology including information on the research design, measure development and purification, and data collection and analysis. The methodology followed accepted practices in each stage of the research. A pretest was conducted on a smaller sample from the focal population to test and refine the survey measures. The following chapter presents the results of the data analysis from the final survey.

# CHAPTER 4 – DATA ANALYSIS AND RESULTS

The purpose of this chapter is to present and discuss the results of the survey. As described in Chapter 3, the survey followed the five-step protocol prescribed by Dillman (2000). 636 total customers of transportation providers (i.e., shippers) were first prenotified by phone and/or email of the impending survey. The respondents were then randomly sent one of two versions of the survey – one asking them to consider a good relationship, the other a poor one. The next section of this chapter presents the sample data, including response rates, tests for nonresponse bias, demographics and descriptive statistics.

## SAMPLE DATA

Of the 636 initial surveys, 22 were returned due to incorrect addresses. Another 26 responded stating that they currently did not ship products with trucking or intermodal providers, reducing the total sample to 588. Complete responses were returned from 326 shippers; however four surveys were removed from the data set due to the number of missing responses, for a final response rate of over 54%. Each of the three waves was compared against the other two to determine if significant differences existed (Armstrong and Overton 1977). There were no differences; therefore nonresponse bias was not thought to be a concern. In addition, nonrespondents were called and asked to complete five of the non-demographic survey items per Mentzer and Flint (1997). The responses

from thirty-one nonrespondents were compared to the data from respondents, and again, no significant differences were found.

**Demographics**

The customer respondents represented the consumer packaged goods (14%), chemicals/plastics (14%), automotive (9%), industrial products (19%) and other industries with a wide range of sales revenue ($1 million to greater than $1 billion). Most of the respondents were from manufacturing firms (74%), with the rest split among retailers (6%), distributors (9%) and suppliers (9%). To ensure the respondent dealt with a portfolio of relationships, they were asked how many providers their firm used. 58% used 21 or more providers, 35% used between 6 and 20, and the rest used 5 or less. This is a good indication that the majority manage a large number of carrier relationships. Respondents also reported on the number of employees at their firm responsible for managing carrier relationships. Nearly all (94%) firms represented had more than one person in this role, with 61% using four or more people. No significant differences were found in the survey results for the above demographics.

Other information specific to the respondent or the carrier relationship was collected as well. The respondents were asked how long they personally and their firm have used the provider to transport their freight. Most of the firms (70%) and the respondents (60%) had been dealing with the carrier for over three years. The respondents therefore have knowledge about this relationship. It was expected that different levels of management might view relationships differently. Therefore, the contact requested was the highest level in logistics involved in relationships with carriers

knowing that this would provide a mix of positions. Survey respondents included analysts and supervisors (10%), entry-level managers (41%), upper-level managers and directors (30%) and executive management (19%). The lower levels seemed to be a little more critical of the relationships than executive management since they work with the relationship on a daily basis. These types of issues should be explored further in future research (see Chapter 5).

The importance of the relationship was "double checked" by determining the number of daily shipments (27% said 1-5; 20% 6-10; 26% greater than 40) and percentage of freight carried by the transportation provider (35% said less than 10%; 24% 10-20%; 23% 21-40%). In addition, the type of product(s) shipped were ascertained (a fairly equal mix of high versus low value and differentiated versus commodity products with 39% carrying a combination of these). Those whose provider carried a higher number of daily shipments, a higher percentage of the shippers' freight, and higher value, differentiated products rated the importance items higher on the survey.

**Descriptive Statistics**

The descriptive statistics for the survey are provided in Appendix E. The results show that the data were considered to be normally distributed. The means for the positively phrased items ranged from 3.40 to 5.43 while those that were negatively worded (items 14, 29, 30, 33, 36, 39, 41, and 43) had means between 2.40 and 4.56. Every item obtained the full range of answers (from 1 to 7). Standard deviations for the items ranged from 1.231 to 1.909. The highest kurtosis was 1.316 (highlighted in Appendix E); however this value was not high enough to be a concern. Prior to analysis

of the structural equation model, the measurement model was first examined to assess the construct validity of the scales (Anderson and Gerbing 1988).

## SCALE CONFIRMATION

The measures and scales were analyzed in both SPSS and AMOS. Missing values in the data set (17 in total out of over 12,000) were replaced using the EM method in SPSS, which uses an iterative process to estimate the means, covariance matrix and correlation of variables with missing values. Replacing these random missing values allows SEM packages to better calculate the various components of model fit (Hair et al. 1998). A confirmatory measurement model, allowing all latent variables to correlate with each other and with individual manifest variables loading on their appropriate latent variable, was run in AMOS. The maximum likelihood estimation was used as it is the most common estimation procedure for theory-based models (Anderson and Gerbing 1988; Hair et al. 1998). The measurement model is shown in Appendix E. One data record appeared to be a bit of an outlier; however its removal did not change the measurement model results, and so it was not removed. No offending estimates (i.e., those with negative variance or loadings greater than 1.0) were found. Various components of the SEM output – standardized regression weights, squared multiple correlations, standardized residuals, modification indices, and goodness of fit indicators – were used to confirm the scales through their unidimensionality, reliability and construct validity. These analyses are subsequently presented.

**Unidimensionality**

Unidimensionality is demonstrated through the overall goodness of fit of the model, the convergence of items on the latent variable they purport to measure and the discriminance of items on latent variables they are not intended to measure (Anderson and Gerbing 1982; Gerbing and Anderson 1988). The fit of the measurement model, which is the highest possible fit the model can achieve, is good. The root mean square error of approximation (RMSEA) is .069; comparative fit index (CFI) is .972, and chi-square per degrees of freedom (CMIN) is 2.535. The convergence and discriminance are presented in the Construct Validity section. The unidimensionality was supplemented with individual factor unidimensionality tests in SPSS, results of which are shown in Appendix E. All individual factor tests showed significant loadings with one factor explaining the majority of the variance.

The exploratory factor analysis loadings done in SPSS in Appendix E show that there may be some unidimensionality issues. Three of the strategy congruence items (C27, C28, and C31) cross-load on relationship type. This is likely due to order effects in the survey. This was not found in the pretest as there were issues with the unidimensionality of the type measures, and this was believed to be the root of the problem between these two constructs. The strategy congruence questions directly followed the type measures, and item C26, the final type question, used the word, "strategic." The two negatively phrased capability congruence items (C33 and C36) cross-load on value. Capability congruence was one of the most mentioned drivers of relationship structure in the qualitative phase of this research. The interviews conducted in this phase did not ask about specific relationships; however, the survey targeted the

relationship between shippers and carriers. It is possible that shippers view capabilities as the "price of entry" into any relationship, regardless of magnitude or type. If this is the case, then it stands to reason that they would associate a lack of capabilities with a lack of value. Finally, one relationship type item (C21) cross-loads on trust. The item refers to describing the relationship as 'cooperative' rather than 'arm's length.' Practitioners may consider these two terms ends of a continuum, and therefore this could have been perceived as a "double-barrel" measure. Each of these issues was explored further in the SEM confirmatory factor analysis.

The loadings from the confirmatory factor analysis are shown in Appendix E. All items loaded significantly and presented no major issues, with the exception of two loadings less than 0.50 (C14 and C17). Unidimensionality is further examined in the tests for convergent and discriminant validity.

**Reliability**

Reliability of the measures was examined in three ways. First, coefficient alpha was calculated in SPSS. The alpha for four of the constructs (dependence, strategy congruence, capability congruence, and value) was low (less than 0.70). The items for trust, commitment and dependence were combined into a composite score for each data record so that the scale for relationship magnitude could be examined as well. Because coefficient alpha often underestimates the scale reliability when items have unequal reliabilities (Gerbing and Anderson 1988), two other reliability measures were calculated following Garver and Mentzer (1999). All of the scales had construct reliability greater than the acceptable value of 0.70. The variance extracted for each construct was greater

than the acceptable value of 0.50 with the exception of dependence and capability congruence. Due to the cross-loading of capability congruence measures, this was not a surprise. Dependence, however, required further investigation. These results are shown in Appendix E and summarized in Table 4.1.

**Construct Validity**

The results of the measurement model were used to assess predictive, convergent, and discriminant validity following the guidelines in Garver and Mentzer (1999). Predictive validity is shown when the correlations between constructs that should predict other constructs are substantial in magnitude and statistically significant. The results, provided in Table 4.2, show that all correlations were greater than 0.55 and were statistically significant. The analysis of the full structural model will provide more support for this.

The overall fit of the measurement model was good. The regression weights of the items on the latent variables were all in the appropriate direction, were all statistically significant to 0.01, and were all greater than 0.50 as shown in Appendix E. These results demonstrate support for both convergent validity and unidimensionality. Stronger support would have been provided if all weights were greater than 0.70. Ten of the 38 items were lower than this benchmark value; however many of these were just below 0.70. Only four of the items were less than 0.65 – these being the "repeat offenders" from dependence (C14 and C17) and capability congruence (C33 and C35).

Considering that none of the correlations among the latent constructs in the measurement model were very low, discriminant validity was analyzed by comparing the

**Table 4.1**
**Summary Of Final Scale Reliability**

| Construct | Dimensions | Items/Uni | Reliability | | | 2nd Order Reliability | | |
|---|---|---|---|---|---|---|---|---|
| | | | α | Scale | Var Ext | α | Scale | Var Ext |
| Magnitude | Trust<br>Commitment<br>Dependence | 5 > 0.90<br>5 > 0.81<br>4 > 0.50<br>1 < 0.50 | .968<br>.937<br>.445 | .968<br>.938<br>.803 | .859<br>.751<br>.462 | .748 | .738 | .489 |
| Magnitude (w/ items removed) | Trust<br>Commitment<br>Dependence | 5 > 0.89<br>4 > 0.77<br>3 > 0.58 | .968<br>.927<br>.809 | .968<br>.928<br>.812 | .859<br>.764<br>.596 | .800 | .799 | .572 |
| Type | N/A | 5 > 0.67 | .867 | .869 | .573 | | | |
| Type (w/ C21 rmvd) | N/A | 4 > 0.66 | .861 | .862 | .612 | | | |
| Value | N/A | 4 > 0.68 | .145 | .882 | .656 | | | |
| Value (w/ C42 rmvd) | N/A | 3 > 0.71 | .920 | .839 | .641 | | | |
| Strat Con | N/A | 5 > 0.57 | .261 | .868 | .573 | | | |
| Cap Con | N/A | 4 > 0.58 | .281 | .730 | .406 | | | |
| Importance | N/A | 5 > 0.72 | .975 | .908 | .666 | | | |

**Table 4.2**
**Construct Correlations**

| Construct Relationship | Correlation | Significance |
|---|---|---|
| Strategy Congruence → Trust | .805 | 0.000 |
| Capability Congruence → Trust | .715 | 0.000 |
| Importance → Trust | .550 | 0.000 |
| Strategy Congruence → Commitment | .753 | 0.000 |
| Capability Congruence → Commitment | .666 | 0.000 |
| Importance → Commitment | .605 | 0.000 |
| Strategy Congruence → Dependence | .602 | 0.000 |
| Capability Congruence → Dependence | .626 | 0.000 |
| Importance → Dependence | .658 | 0.000 |
| Trust → Type | .755 | 0.000 |
| Commitment → Type | .769 | 0.000 |
| Dependence → Type | .651 | 0.000 |
| Type → Value | .798 | 0.000 |

model to a model with all correlations fixed to one (Garver and Mentzer 1999). The chi-square difference test between these two models was significant to 0.01, providing support that the latent variables are distinct. In addition, this test was performed on some pairs of constructs – the exogenous variables, the dimensions of relationship magnitude, the two pairs that had crossloading concerns in the factor analysis, and three other pairs that had correlations greater than 0.80 to ensure multicollinearity was not an issue (Hair et al. 1998). These tests, presented in Appendix E, provide additional support for discriminant validity in that all differences were significant to 0.01.

AMOS provides some additional results to diagnose problems with item reliability and scale validity. The modification indices show potential improvements if items were allowed to load on any latent variables. From these results, in Appendix E, there were apparent issues with the potential for items C16, C17, C21 and C42 to load on other constructs. The standardized residuals, or the difference between the items on the actual matrix versus the estimated matrix, were all low values with less than 5% over the acceptable level of 2.58 (Hair et al. 1998). Over 70% of those that were greater than 2.58 occurred with items C14 and C17 (dependence). The squared multiple correlations are provided in Appendix E as well. Two items, C14 and C17, had correlations below 0.3, which means these items are not contributing much to the reliability of the construct they are supposed to measure (dependence). All of the suspect results will be summarized and addressed in the following section as part of the modification to the measurement model.

**Model Modification**

The primary issues with the measurement model occurred with items C14, C16, C17 (dependence), C21 (type), C33, C35 (capability congruence) and C42 (value). Items C14 and C17 showed the biggest problems in that they had the lowest regression weights, the lowest squared multiple correlations, the highest number of offending standardized residuals, and high modification indices. These two measures addressed replacement of the provider with an alternative. Considering the number of trucking and intermodal providers available in the market, shippers probably believe that alternatives are plentiful; therefore they are not as concerned with replacing their providers. The other three dependence items target how much the shipper needs the provider. Items C14 and C17 were originally used because they were part of the dependence scale adapted from Ganesan (1994). The definition of dependence used for this dissertation is the perception of the need of one party for the other to achieve desired goals. Therefore, the measures questioning alternatives were not necessarily needed to tap the construct definition. If items C14 and C17 are removed, the coefficient alpha of dependence increases from .445 to .809 and the variance extracted increases from .465 to an acceptable level of .598, as shown in Table 4.1. The reliability of the relationship magnitude scale increases, as does the overall fit of the measurement model (RMSEA of .065, CFI of .977, CMIN of 2.346). In addition, the presence of high modification indices for item C16 disappears when C14 and C17 are no longer in the model. Based on the statistical results and the theoretical support, items C14 and C17 were removed from the measurement model, and C16 was retained.

Because items C21 and C42 have high modification indices, they present unidimensionality issues for their respective constructs. There is a slight increase in the model fit if both are removed (RMSEA of .062, CFI of .980, CMIN of 2.250). Additionally the removal of item C42 greatly improves coefficient alpha (increases from .145 to .920). Item C21 was a borrowed measure (Boyle et al. 2001), however the other items associated with this measure were not used verbatim because they appeared to be too related to commitment measures. Perhaps this contributed to the cross-loading of C21 on trust. Item C42, which discusses benefits, is slightly broader than the other three value measures, which mention both benefits and costs. Due to the improvements in the model without these measures, and the problems with their wording, these items were eliminated.

Items C33 and C35 have lower regression weights, and C33 cross-loads on value. However, removal of these items has no real effect on reliability or validity and would leave the construct with only two measures. The issue is more likely with the entire construct of capability congruence, as discussed earlier, and not the specific items. Thus, these items were kept and further examination of this construct will be needed in future research.

The first order structural model was then run in AMOS to make sure there were no additional problems with any of the measures. Surprisingly, with the relational paths now in place, item C10 loaded perfectly (1.00) on commitment. This result was not possible and caused problems with the model fit. The measure states that the relationship deserves the shipper's maximum effort to maintain. It is possible that the respondents believed the words 'maximum effort' to be a bit extreme. The removal of this item does

not really impact the reliability or validity of the commitment scale. Due to the loading results, this item was removed from the model. The final factor loadings are shown in Table 4.3. With the measurement model now purified, the hypotheses could be tested using the full structural model depicted in Figure 4.1.

## HYPOTHESES TESTS AND MODEL ANALYSIS

Before examining the specific hypotheses, the basis for the relationship magnitude theory – that relationship magnitude is a second order construct composed of the three dimensions of trust, commitment and dependence – was first analyzed. This was done by comparing the results of the first order model to the theoretical second order model and then comparing the theoretical model to an alternative model where trust, commitment and dependence were antecedent to, rather than dimensions of, magnitude. All of these models are shown in Appendix F.

The first order model had relatively good fit. The second order model, which was more parsimonious, was significantly better when comparing the chi-square and PNFI fit measures. The fit indices for both of these models are listed in Table 4.4. The path loadings for the second order model were all significant, and in most cases, larger than those in the first order model. Additionally, an alternative model setting trust, commitment, and dependence as antecedent to, rather than dimensions of, relationship magnitude was run. Because there were no direct measures for relationship magnitude, the question (C55) asking about the term used to describe the relationship was used as a proxy. This item was significantly correlated (.564 at an alpha of .01) with the mean composite score for relationship magnitude (using the means of trust, commitment, and

**Table 4.3**
**Summary of Confirmatory Factor Loadings**

| | Tru | Com | Dep | Type | SCon | CCon | Imp | Val |
|---|---|---|---|---|---|---|---|---|
| C1 | .925 | | | | | | | |
| C2 | .941 | | | | | | | |
| C3 | .908 | | | | | | | |
| C5 | .931 | | | | | | | |
| C6 | .930 | | | | | | | |
| C8 | | .894 | | | | | | |
| C9 | | .877 | | | | | | |
| C11 | | .814 | | | | | | |
| C12 | | .906 | | | | | | |
| C15 | | | .769 | | | | | |
| C16 | | | .911 | | | | | |
| C18 | | | .608 | | | | | |
| C22 | | | | .664 | | | | |
| C24 | | | | .798 | | | | |
| C25 | | | | .839 | | | | |
| C26 | | | | .817 | | | | |
| C27 | | | | | .814 | | | |
| C28 | | | | | .870 | | | |
| C29 | | | | | -.577 | | | |
| C30 | | | | | -.697 | | | |
| C31 | | | | | .789 | | | |
| C32 | | | | | | .736 | | |
| C33 | | | | | | -.574 | | |
| C35 | | | | | | .602 | | |
| C36 | | | | | | -.631 | | |
| C37 | | | | | | | .879 | |
| C38 | | | | | | | .726 | |
| C39 | | | | | | | -.863 | |
| C40 | | | | | | | .780 | |
| C41 | | | | | | | -.821 | |
| C43 | | | | | | | | -.706 |
| C45 | | | | | | | | .706 |
| C46 | | | | | | | | .962 |

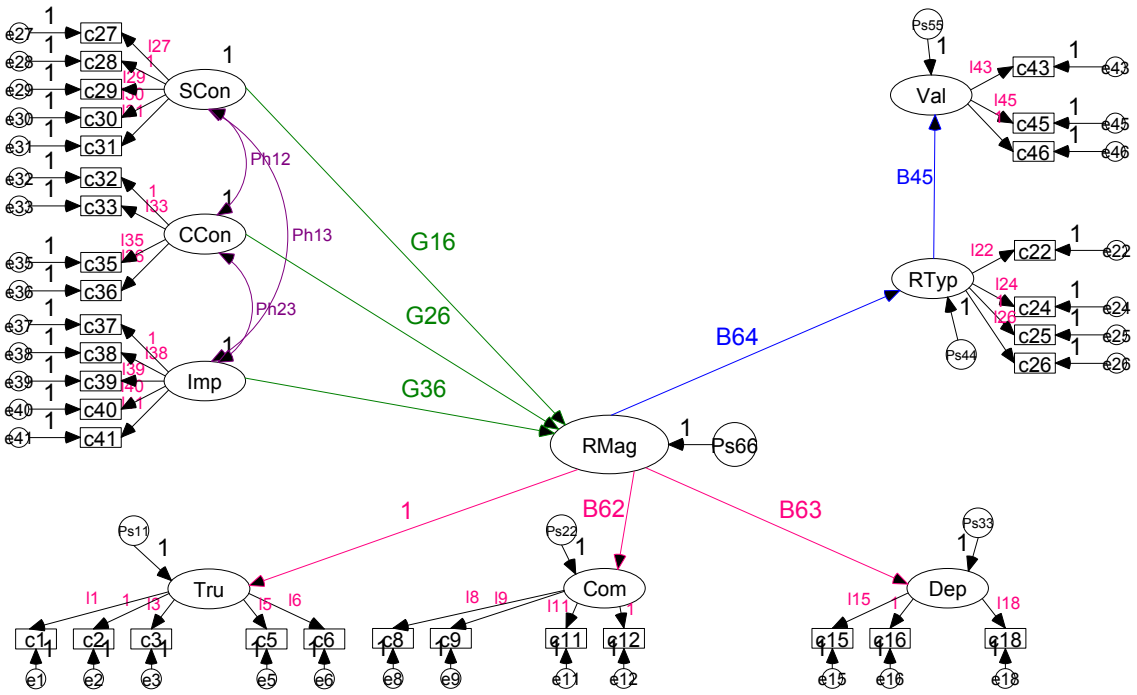



**Figure 4.1**
**Full Structural Model**

**Table 4.4**
**Model Fit Comparisons**

| | 1st Order Structural | 2nd Order Structural | Magnitude Alternative |
|---|---|---|---|
| Chi-square | 1387.555 | 1322.306 | 1963.585 |
| RMSEA (< .08)[1] | .077 | .073 | .093 |
| CFI (> .90)[1] | .897 | .905 | .840 |
| TLI (> .90)[1] | .887 | .897 | .827 |
| PNFI (high)[1] | .777 | .791 | .736 |
| CMIN (< 3.0)[1] | 2.879 | 2.715 | 3.783 |
| Target Coef (sig)[2] | n/a | 75 for 5 df → sig | 641 for 28 df → sig |

[1]Hair et al. (1998)
[2] Marsh and Hoceuar (1985)

dependence items) and was therefore deemed most appropriate as a proxy measure. The alternative model resulted in a poor fit and was significantly worse than the theoretical model, providing more support for the argument that relationship magnitude is a second order construct comprised of the three dimensions of trust, commitment and dependence. The fit indices for the alternative model are also listed in Table 4.4 for easy comparison. To add more support to the argument that trust, commitment, and dependence are dimensions of magnitude, a separate global measure of relationship magnitude should be developed and tested in future research.

The second order theoretical model resulted in good fit indicators. All paths connecting latent variables in the model were significant to 0.01. This lower significance level is necessary when using maximum likelihood estimation on larger sample sizes (Hair et al. 1998). The acceptable convergent and discriminant validity from the measurement model along with the good fit of the structural model confirms nomological validity of the theory (Anderson and Gerbing 1988). The solution to this theoretical model was used to evaluate the five hypotheses developed and presented in Chapter 2. An evaluation of each of the hypotheses is presented in the following subsections.

**Hypothesis 1**

Hypothesis 1 stated that an increase in the level of relationship magnitude increases the level of relationship type. Based on the positive beta path estimate (shown in blue in the second order model results in Appendix F) of 0.95, this hypothesis was strongly supported at the $\alpha = .01$ level.

**Hypothesis 2a**

Hypothesis 2a stated that an increase in the level of strategy congruence increases the level of relationship magnitude. Based on the positive gamma path estimate (shown in green in the second order model results in Appendix F) of 0.66, this hypothesis was strongly supported at the $\alpha = .01$ level.

**Hypothesis 2b**

Hypothesis 2b stated that an increase in the level of capability congruence increases the level of relationship magnitude. Based on the positive gamma path estimate (shown in green in the second order model results in Appendix F) of 0.22, this hypothesis was supported at the $\alpha = .01$ level.

**Hypothesis 2c**

Hypothesis 2c stated that an increase in the level of importance increases the level of relationship magnitude. Based on the positive gamma path estimate (shown in green in the second order model results in Appendix F) of 0.22, this hypothesis was supported at the $\alpha = .01$ level.

**Hypothesis 3**

Hypothesis 3 was an exploratory hypothesis that stated a change in the level of relationship type changes the level of relationship value. Based on the beta path estimate (shown in blue in the second order model results in Appendix F) of 0.83, this hypothesis

was strongly supported at the $\alpha = .01$ level. This result is positive and therefore shows an increase in the perceived level of value with an increase in the type of relationship. All of these results are discussed further in Chapter 5.

## SUMMARY

The structural equation model was analyzed in two steps per Anderson and Gerbing (1988). Analysis of the measurement model revealed four items that needed to be removed resulting in a good overall fit (RMSEA of .062, CFI of .980, CMIN of 2.250) and support for the reliability and construct validity of the remaining measures. Initial runs of the structural model exposed an offending estimate, and thus one more item was removed from the model. The second order, theoretical model of relationship magnitude was significantly better and more parsimonious than the first order model. The theoretical model also supported the contention of this dissertation that relationship magnitude is composed of the three dimensions of trust, commitment and dependence. All of the paths in the model were statistically significant thus supporting each of the hypotheses presented in the dissertation. Discussions of the conclusions and contributions from this research along with opportunities for future research are presented in the following chapter.

# CHAPTER 5 – CONCLUSIONS AND IMPLICATIONS

The purpose of this dissertation was to empirically test a theory-based structural equation model primarily investigating the effect of the relationship structure on the resulting value received from the relationship. The research is distinct in that it tests two components of relationship structure in the business-to-business context – relationship magnitude and relationship type. Relationship magnitude was measured as a second order construct comprised of the existing, heavily researched relational constructs of trust, commitment, and dependence. This differs from the extant literature in that trust, commitment, dependence and other constructs have been historically treated as antecedent to levels of relationships.

A great deal of research has been conducted on interorganizational relationships in the marketing, channels, and logistics literature that attempts to explain the various relationship antecedents and predict the outcomes. No theory, however, exists in the literature reviewed in Chapter 2 that fully explains the components of relationship structure or how to manage a portfolio of relationships in order to achieve the most value from them. This dissertation attempted to do that by clarifying how a relationship is structured.

The relationship structure structural equation model (RSSEM) presented in Chapter 3 and its associated research hypotheses were deduced from the literature review and qualitative interviews presented in Chapter 2. The five hypotheses are summarized as follows.

H1: An increase in the level of relationship magnitude increases the level of relationship type.

H2a: An increase in the level of strategy congruence increases the level of relationship magnitude.

H2b: An increase in the level of capability congruence increases the level of relationship magnitude.

H2c: An increase in the level of importance increases the level of relationship magnitude.

H3: A change in the level of relationship type changes the level of relationship value.

The RSSEM was then tested using a quantitative survey in an effort to answer the research questions in Chapter 1. The primary and secondary research questions were:

- What is the effect of the level of magnitude on relationship type and on the perception of value from the relationship?
    - How does the business situation drive the level of magnitude?
    - What is the optimal level of relationship magnitude for a given situation (as determined through value)?
    - How do companies perceive relationship value?

This chapter discusses the results achieved in light of the research questions and their theoretical and managerial implications.

The following section presents a discussion of the findings from the theoretical model testing and for each of the five hypotheses tested. Next it is described how these results address the research questions and how the research study accomplished the dissertation objectives. The contributions of the research are then presented, followed by

suggestions for future research to address the limitations of this study. Finally, concluding remarks are offered.

## DISCUSSION OF FINDINGS

The model theorizing relationship magnitude as a second order construct was found to have a significantly better fit than the first order model or the alternative model depicting trust, commitment and dependence as antecedent to, rather than dimensions of, relationship magnitude. These results are discussed in greater depth. This is followed by discussions of each of the hypotheses. Although the hypotheses were supported, it is important to note that causation in the relationships cannot be concluded. It was not methodologically possible to include every possible construct that might be connected to this theory, nor was it theoretically appropriate to test every possible path combination which are the conditions required to conclude causation (Anderson and Gerbing 1988; Loehlin 1998).

### Theoretical Model

When compared to the first order model (direct paths to and from trust, commitment, and dependence with no second order construct), the second order model was significantly better and more parsimonious (CFI of .905 over .897, chi-square of 1322.3 over 1387.5). Bove and Johnson (2001) conceptualized relationship strength or magnitude (they used these terms interchangeably) as a second order construct; however they did not test this but called for empirical research to do just that. The paths from the antecedents to magnitude and from magnitude to type are larger in the second order

model thus explaining more of the variation among the constructs. This supports the contention that relationship magnitude is a higher order construct comprised of first order relationship constructs.

Empirical studies in the past have conceptualized trust, commitment, and dependence as antecedents to relationships (e.g., Andaleeb 1995; Ganesan 1994; Mentzer, Min and Zacharia 2000; Monczka et al. 1998; Morgan and Hunt 1994; Wetzels, de Ruyter and van Birgelen 1998). However the second order theoretical model strongly supports these three constructs as dimensions. Not only are the loadings significant (.80, .80, and .66 respectively), but the reliability using these three as measures is high ($\alpha$ = .800, scale = .799, variance = .572). To provide more support for this, trust, commitment, and dependence were tested as antecedents to magnitude. The second order theoretical model was again significantly better. The levels of trust, commitment, and dependence in the relationship can therefore be used to measure the magnitude of an interorganizational relationship.

**Hypothesis 1**

Hypothesis 1 states that an increase in the level of relationship magnitude increases the level of relationship type. This hypothesis was supported as a strong positive relationship (path weight .95) and is statistically significant to $\alpha$ = .01. Bove and Johnson (2001) state that magnitude is a function of the type of relationship. However this research conceptualizes type as a function (outcome) of magnitude. When empirically tested, this is strongly supported. Relationship magnitude accounts for nearly all of the variance in relationship type.

Because they are so closely related, the results substantiated the position that magnitude and type are two components of relationship structure. It also provides further support for trust, commitment, and dependence as dimensions of the higher order construct, relationship magnitude, which is antecedent to the level of relationship type. This finding is significant for interorganizational relationships and supply chain management as higher levels of magnitude are necessary to achieve higher relationship types (i.e., closer relationships through higher levels of trust, commitment, and dependence are necessary to achieve cooperative and integrative relationships).

**Hypothesis 2a**

Hypothesis 2a states that an increase in the level of strategy congruence increases the level of relationship magnitude. This hypothesis was supported as a strong positive relationship (path weight .66) and was statistically significant to $\alpha = .01$. Lassar and Kerr (1996) proposed that closer relationships require a fit between firms' strategies. Anderson and Weitz (1989) found empirical support for a positive relationship between goal congruence and trust. This study found that the match between strategies explained 66% of the variance in relationship magnitude.

This finding substantiated previous research on the relationship between strategy congruence and relationships. However, this particular study related strategy congruence specifically to the magnitude of the relationship. The qualitative interviews frequently mentioned a match between strategies as a prerequisite to developing closer relationships. According to the survey data, in order to achieve higher levels of relationship magnitude, a higher level of congruence in strategies is required.

**Hypothesis 2b**

Hypothesis 2b states that an increase in the level of capability congruence increases the level of relationship magnitude. This hypothesis was supported as a positive relationship (path weight .22) and was statistically significant to $\alpha = .01$. The qualitative phase of this research found that the match between a need for a capability and its fulfillment through a relationship with a firm that has the capability motivates one or both firms to pursue a closer relationship. Resource dependence theory, which is heavily researched in interorganizational relationship literature, posits that when resources and competencies are not readily or sufficiently available, firms are likely to establish ties with other organizations (Child and Faulkner 1998). Based on the findings, capability congruence accounted for 22% of the variance in relationship magnitude.

While this result supports the qualitative findings and resource dependence theory, a path weight of .22 is not very strong. This could be due to the lower loading of some of the capability congruence measures identified in Chapter 4. The particular population chosen (customers of transportation providers) for the quantitative survey could also be contributing to this low result. It is likely that carrier capabilities are the "price of entry" for any relationship with a shipper. Therefore, it may require much higher levels of capability congruence to have a stronger impact on the level of relationship magnitude. This is something that should be considered further in future research.

**Hypothesis 2c**

Hypothesis 2c states that an increase in the level of importance increases the level of relationship magnitude. This hypothesis was supported as a positive relationship (path weight .22) and was statistically significant to $\alpha = .01$. In the qualitative interviews, the perceived importance, discussed as the frequency or volume of business, of a supplier or customer was seen as a driver of relationship magnitude. This was supported in other empirical studies as described in the literature (Heide and John 1990; Sriram, Krapfel and Spekman 1992). It is therefore surprising that importance only accounted for 22% of the variance in relationship magnitude.

The finding statistically supports a relationship between importance and magnitude; however the support is weak. The item loadings for the importance measures were all strong so it is thought that the weak path weight is due to the population chosen for the survey. Even if a carrier has a high volume of business, it is possible that the shipper does not consider the carrier important enough to develop a higher level of relationship. Analysis of only those respondents whose carrier handled larger amounts of freight (greater than 41% or greater than 40 shipments per day) showed no difference in the relationship between importance and magnitude. It is also possible that the availability of carriers due to high competition in the trucking and intermodal industries played a role in this low result. In other words, even if a transportation provider carries a great deal of a shipper's freight, they are easily replaceable and so this may not be a major driver of relationship magnitude.

**Hypothesis 3**

Hypothesis 3 states that a change in the level of relationship type changes the level of relationship value. This hypothesis was supported as a strong positive relationship (path weight .83) and was statistically significant to $\alpha = .01$. This hypothesis was exploratory because the literature is mixed on the nature of the perception of value from types of relationships. It was stated in Chapter 2 that intuitively this relationship should be positive. However, firms do not always purposefully structure their business relationships or measure the value from them. Therefore, firms do not always know if they are getting value from their relationships (Cannon and Perreault 1999; Cox 2001). Because it was unknown if the relationship would be consistent, the direction was not stipulated.

The perceptions from the qualitative interviews were similar to the literature. The interviewees viewed value as an evaluation of benefits and costs and as an outcome of relationships, but there was no consensus on whether the relationship between type and value was positive or negative or otherwise. Some responded that less effort and costs were needed for closer relationships, while others felt closer relationships required too much time and effort. Therefore the determination of the direction of the relationship was left open for discovery. The survey findings show that this relationship is positive for this sample. Not only is the relationship positive, it is also very strong, as relationship type explained 83% of the variance in value. The findings were consistent when the data set was broken down and analyzed by the various groups of relationship type (arm's length, cooperative, and integrative) asked in question 27 on the survey (all paths were

significant and positive with path weights greater than .75). According to the data, closer relationships and higher levels of relationship type result in higher value.

## RESEARCH QUESTIONS

The primary objective of this dissertation was to fill gaps found in prior research. The first gap concerned the concept of closeness in an interorganizational relationship and how this fit into the existing relationship literature. Specifically, the research examined the little studied construct of relationship magnitude. Variations on the closeness in a business-to-business relationship, such as embeddedness, intensity and strength (Beekun and Glick 2001; Donaldson and O'Toole 2000; Granovetter 1973; Rindfleisch and Moorman 2001) have been addressed in the literature, but none of these studies links the concept to other aspects of relationship structure (such as governance or type).

Two studies focus on relationship magnitude. Golicic, Foggin, and Mentzer (2003) discuss the concept of magnitude describing the closeness in an interorganizational relationship as one aspect of how firms structure the relationship. The authors conceptualize it as distinct from another aspect of structure, relationship type, and propose it to be a higher order construct comprised of existing relationship constructs. Bove and Johnson (2001) also conceptualize magnitude as the strength in business-to-business relationships and proposed it to be a higher order construct. Neither of these studies empirically tests relationship magnitude.

This dissertation builds on the conceptualization of relationship magnitude by Golicic, Foggin, and Mentzer (2003) as a second order construct distinct from the

construct of relationship type. The construct was operationalized through its three dimensions of trust, commitment, and dependence with the purpose of empirically testing these conceptualizations. Based on the fit of the theoretical model, this first gap was bridged. The loadings of the three dimensions on magnitude were large and significant. In addition, the fit of the theoretical model was significantly better than the magnitude alternative with trust, commitment, and dependence as antecedents. This provides evidence for the operationalization of magnitude through trust, commitment, and dependence. The results for the five hypotheses and the comparison of the first order model to the theoretical model supports relationship magnitude as a construct distinct from, but related to, type. An additional factor analysis using the measures for type and composites of trust, commitment, and dependence for three measures of magnitude was done. The two scales are significant, unidimensional and discriminate adding more evidence that the two constructs are distinct.

The remaining gaps addressed by this dissertation were identified through specific research questions. This research sought to answer the primary question, "What is the effect of the level of magnitude on relationship type and on the perception of value from the relationship?" Secondary questions were explored as well, including:

- How does the business situation drive the level of magnitude?
- How do companies perceive and measure relationship value?
- What is the optimal level of magnitude for a given situation (as determined through value)?

How the research answered each of these is discussed.

**Effect of Magnitude on Type**

The primary research question was the heart of the theoretical model. By asking this question, it was hoped that the research study would support the claim that relationship magnitude was a construct distinct from relationship type. As value has been accepted as an outcome of relationships (Barringer and Harrison 2000; Nevin 1995; Nooteboom 1999; Stern, El-Ansary, and Coughlan 1996), it was hoped that it would be an outcome from the two relationship constructs to show that how an interorganizational relationship is structured plays an important role in achieving value in the relationship.

It was hypothesized that relationship magnitude would have a significant, positive effect on relationship type (H1) and that a change in relationship type would then change the perception of value from the relationship (H3). As described earlier, the results strongly support both of these hypotheses (with positive path weights of .95 and .83 respectively). An increase in relationship magnitude increases the type of relationship; therefore the effect is a strong, positive one. An increase in the type of relationship then increases relationship value. According to the dissertation model and the survey results, the effect of relationship magnitude on relationship value is mediated by relationship type. Any other effects among these constructs are left for future research.

**Drivers of Magnitude**

Those interviewed in the qualitative phase of this research were asked to describe when and why their firm would develop new relationships or change existing ones. The goal was to learn about how a business situation influences the magnitude of a relationship with another firm. Several things were mentioned that drive a firm to change

the level of closeness between them and another firm. Interviewees described situations where:

- **strategies of the two firms were similar**,
- **the other firm had particular resources and/or capabilities that the firm desired**,
- **the other firm accounted for a large portion of the company's business**,
- the other firm performed extremely well or poorly over a period of time,
- the other firm had particular characteristics that were of interest,
- the nature of the business environment led them to the other firm,
- the other firm was particularly successful or unsuccessful financially,
- there was an interpersonal relationship between the two firms' representatives,
- there was a desire to solve a particular problem,
- there was a long history with the other firm,
- the status of relationships with other firms enabled or prevented certain relationships, and
- the firm's overall goals were changing which then impacted their relationship strategies.

The three most frequently mentioned situational drivers (in bold) were then tested through the survey. The match between firm strategies plays a large role in the level of magnitude. Often decisions to conduct business with another firm stems from the operating strategy of a company, hence it makes sense that a match between strategies (i.e., the goal of where the company wants to be in the future) leads to a closer

relationship. The importance of the other party and the match between the need for and supply of capabilities also play a role in the level of magnitude, although a smaller one. In situations with carriers that have resources needed by the shipper and that move a high volume of their freight, shippers desire some level of relationship magnitude. However, if there is a match between the shippers and carriers' strategies, then the shippers desire a higher level of magnitude. Firms may see closer relationships as a means to accomplish their strategic goals, making this driver more influential.

This research shows that characteristics of the business situation influence the level of relationship magnitude. Those tested in the theoretical model affect the magnitude in a positive direction. Some situational drivers play a larger role than others; for example, the congruence between firm strategies has a larger influence on the magnitude than the match between the need for and supply of capabilities or the volume of business conducted with the other firm. The influence of these situational drivers may be different when considering other relationships within the supply chain or when tested with other characteristics, but that is left for future research.

**Perceptions and Measures of Value**

The qualitative phase of the research addressed the outcome of different levels of relationships. Respondents were asked about and described the "value" they receive from relationships. The interview data show that firms do not quantitatively measure this value. This is an area where firms struggle. They do, however, judge the value based on a perceptual evaluation of benefits (e.g., increased business, higher efficiencies, better visibility, decreased inventory, higher responsiveness, allocation priority, and the sharing

of knowledge) versus costs (e.g., greater time and effort, the commitment of additional resources, the decrease of leverage over the other party, and information security). Sometimes these perceptions were simply based on feelings such as comfort and not necessarily connected to any benefits or costs.

Others did utilize measures in their perceptual evaluations. Over half of the interview participants cited standard performance metrics such as inventory levels, delivery times and market share as a means to determine value. However, these metrics do not necessarily identify what can specifically be attributed to the magnitude of the relationship. A few of the respondents examined the amount of business gained, maintained, and/or lost in their relationships. The idea was to equate this to revenue changes. One firm had attempted to track their asset utilization when working closely with another company in order to identify and eliminate redundancy. The goal was to put a dollar amount on the cost savings.

In summary, companies do not quantitatively measure the value of the relationship itself. Rather, they infer value from perceptions that are often supported by operational performance metrics. The lack of measurement likely stems from not knowing how to isolate and quantify the benefits and costs directly attributable to the relationship. Measuring the value from a relationship is an area that needs more attention as little has been done in practice. This will be addressed again in the future research section.

**Optimal Level of Magnitude**

The results of the study show that in order to reach a high level of value, a high level of relationship type is needed (i.e., further toward the integrated end of the type continuum). For this, a high level of relationship magnitude needs to be achieved. Because the relationships among these constructs are large and positive, the desired level of magnitude that a firm wishes to have in a relationship should be directly related to the desired level of value they wish to obtain. Once the desired level of value is known, a firm can work with the antecedents and the dimensions of magnitude to achieve the desired level of magnitude. For example, if Firm A wants a moderate level of value from a particular relationship with Firm B, then they must reach a moderate level of type (some sort of cooperative relationship) and a moderate level of magnitude for this type. To attain this level of magnitude, Firm A needs to ensure there is a moderate level of match between their strategies and those of Firm B. The firms need to perceive that the other is somewhat important and has the capabilities they need. They then need to work on the levels of trust, commitment, and dependence within the relationship to build the level of magnitude needed.

Value is dictated by both the benefits received and the costs invested. A firm cannot, therefore, just strive for the highest level of value in every relationship. It is not possible, nor reasonable for every relationship to obtain the highest level of relationship magnitude and type due to the costs involved. Companies must understand the resource costs needed to obtain higher levels of magnitude with other companies. This amount is probably different for each paired relationship. If the costs for a closer relationship are too high as compared to the benefits, then a higher value may not be attainable. The

optimal level of magnitude in a relationship, therefore, should be dictated by the highest level of value a firm believes it can obtain. However, a firm must be able to accurately estimate the costs and benefits involved in order to achieve this level of value. More will be said about understanding the costs and benefits of relationships in the future research section.

## RESEARCH CONTRIBUTIONS

In filling existing gaps in the relationship literature, this dissertation makes important contributions. The findings extend the body of knowledge on interorganizational relationships, and this has theoretical and managerial implications, both of which are discussed.

### Theoretical Implications

This research contributes to the body of knowledge on interorganizational relationships in two ways. First, it provides new knowledge, which fills gaps in the literature, and second, it substantiates previous research. Four theoretical implications will be discussed in this subsection.

The first implication pertains to the findings concerning the construct of relationship magnitude. Bove and Johnson stated that, "there is a clear need for empirical studies to validate the suggested relationship strength construct" which they conceptualized as a second order construct (2001, p. 194). The empirical study done for this dissertation does just what Bove and Johnson called for – it provides evidence in support of the contention that relationship magnitude is a second order construct.

The second implication is related to the finding that relationship magnitude and relationship type are two distinct constructs. The test of the theoretical model found that these two constructs are different yet highly related (path weight of .95). Both of these constructs are conceptualized as components of relationship structure, and the results support that contention. Further research may reveal that relationship structure is a third order construct with magnitude and type as its dimensions.

In the process of verifying the results of relationship magnitude and relationship type, a contribution was made in that measures were determined and tested for both constructs. Trust, commitment, and dependence were tested and supported as the measures of magnitude, explaining 60% of the variance in the construct with a reliability of .80. These three first order constructs utilized existing measures from Morgan and Hunt (1995) and Ganesan (1994), which substantiates these measures in the context of shipper-carrier relations. Relationship type was measured through a combination of existing and new items. Four of the new and adapted items were tested successfully for type. Interestingly, the one existing item that was used verbatim, C21, did not have good results. The measures that Boyle et al. (2001) used successfully in their survey did not work in the context of this research, stressing how important it is to retest measures, even those with no changes, in each study.

Finally, another contribution was made in substantiating prior research on strategy congruence, resource dependency and social exchange. Two previous studies have suggested that company strategies play a role in close relationships (Krapfel, Salmond and Spekman 1991; Lassar and Kerr 1996). Many of those interviewed in the qualitative phase stated that they looked for a match in strategies when determining how close a

relationship they desired with a supplier or customer. The results of Hypothesis 2a show that strategy does play a role – a strong, positive one (path weight of .66).

Resource dependence theory is based on the principal that organizations face uncertainty about their supply of resources and capabilities. When these resources and competencies are not readily or sufficiently available, firms are likely to establish ties with other organizations (Child and Faulkner 1998). The idea of obtaining capabilities that were needed was mentioned in the qualitative interviews. Hypothesis 2b tested the relationship between capabilities congruence and magnitude. Although the result was not very high (path weight of .22), it was significant which provides support in this context for resource dependence theory.

Lastly, this research substantiates the views of value from transaction cost economics and social exchange theory. In the interviews, value was viewed as an evaluation of benefits and costs. These views were used to develop the measures for value in the quantitative survey. Transaction cost economics favors exchange relationships that minimize transaction costs (i.e., that provide economic value). Social exchange theory argues for exchanges that provide social value. Social value is based on both the satisfaction with an exchange partner and a comparative evaluation of alternative options for accomplishing the goals of the relationship (Thibaut and Kelley 1959). Retention of the relationship then occurs if the benefits provided in the relationship outweigh the costs of the relationship. Transaction cost economics and social exchange theory therefore favor closer relationships since, according to the results of this research, closer relationships result in higher levels of value.

**Managerial Implications**

An important contribution for any research is that it provides implications for practical application. The findings from this research result in three managerial implications, which are discussed in this subsection.

The first implication is directed toward transportation providers. Suppliers often complain that they cannot get their customers to collaborate or build closer relationships. They feel that the customer controls the decisions on the structure of the relationship. The empirical data in this dissertation provide guidance to help carriers influence that decision. According to the data, shippers desire a match between their company strategies and those of the carrier. A carrier that wants a closer relationship with one of its shippers should make their strategies known to that shipper or perhaps work with them to develop strategies that have synergies. In addition, the data suggest that shippers look for some sort of "threshold" level of capabilities and importance in order to develop a closer relationship. These are some of the requirements that need to be in place for shippers to move to higher levels in a relationship.

The results also provide evidence for trust, commitment, and dependence as the components of relationship magnitude. To develop a closer relationship, the parties must develop high levels of trust, commitment, and dependence. Much research has been done on these constructs, and the development of high levels of these takes time. Knowing this, transportation providers can work on building these higher levels with the customers with which they desire a close relationship. The survey results demonstrate that shippers feel there is a link between closer relationships and higher levels of value from those relationships. Therefore, shippers will likely pursue these closer relationships when the

situation is right. With this knowledge, carriers can position themselves to be the provider of choice for certain customers.

A second managerial implication pertains to the value of interorganizational relationships. Practitioners are apprehensive about investing time and resources into closer relationships because they seldom see a quick financial return on their investment. The empirical research in this dissertation shows that higher value is an outcome of closer relationships. Other research links value to satisfaction (Gassenheimer, Houston, and Davis 1998) and satisfaction to behaviors such as repeat purchases and relationship retention (Bolton 1998; Lemon, White, and Winer 2002). Tying this dissertation with other relationship and satisfaction research, value may lead to long-term relationships and more business for the parties involved. This process is normally not a fast one. Companies need to understand that positive outcomes will result if they are patient with the process of developing close relationships.

A very important implication of this research is the idea of managing a portfolio of relationships. One size does not fit all. Much of the past research in the relationship literature attempts to cluster interorganizational relationships into a small number of groups or types. While it has not yet been empirically determined if relationship type is a continuous or categorical variable (as support has been found for both), the research on the type of relationship is an important piece. But there is more to the structure of the relationship than just the type. This dissertation builds on the past research and adds another component of the structure – relationship magnitude. Together, the combination of magnitude and type form the structure of the relationship. This then opens the door for an incredible number of different relationship structures.

The empirical results for this dissertation, when examined individually, reveal a great deal of variation in the survey answers. This supports the argument that the respondents are dealing with different relationship structures. When analyzed collectively in the theoretical model, the findings provide a foundation of knowledge on what is needed to help firms build closer relationships in certain business situations. Companies can use the model and its results to analyze each situation to determine if a close relationship is possible, and if it is, whether they can expect higher value from it. For instance, if a firm views a carrier as important and as having the capabilities the firm needs, but the carrier's strategies are different from theirs, then it may not be in their best interest to put a lot of effort into developing higher levels of trust, commitment, and dependence with that carrier. Or if a firm sees all of the requirements (i.e., antecedents) in place, but does not trust or feel committed to the carrier, then a higher level of magnitude is not possible.

Value (i.e., more benefits than costs) can result from every relationship, but as each relationship is different, how each of the requirements and components of magnitude are handled should also differ. To be able to influence the relationship level to achieve higher levels of value, firms need to develop a better understanding of the possible benefits and costs from their different relationships. Value of a relationship cannot be measured if a company does not appropriately isolate and measure the resources put into the relationship and the results from it. This is an area where more research is needed and will be discussed in the following section.

Prior research has stated that customer and supplier firms often pursue inappropriate relationship management strategies because they do not fully understand

their circumstances (Cannon and Perreault 1999; Cox 2001). Firms must make the decision to invest resources in their various relationships. These resources should only be dedicated to those relationships that will truly benefit from the investment (Lambert, Emmelhainz and Gardner 1996). Once a firm can identify the costs and benefits in relationships, they can begin to develop strategies to manage the relationships that compose their portfolio.

## OPPORTUNITIES FOR FUTURE RESEARCH

The limitations in the study provide opportunities as part of an ongoing stream for future research. This section addresses five limitations and presents some thoughts for extending this research.

In the qualitative phase of this research, personnel from firms within a supply chain were interviewed. Therefore both sides of the relationship were represented in the initial portion of the study. The survey, however, was sent to shippers only. The results of this part of the study are only as good as the perceptions of firms on one side of the relationship. As a great deal of prior studies on interorganizational relationships has shown, research can be successfully conducted with one firm in the relationship. But results on interorganizational relationships that are obtained from dyadic samples are more informative. The quantitative study should be extended to the other side of the relationship – the carriers of the respondent shippers. The survey could also be replicated with other dyadic pairs of shippers and carriers. Because this research looks at relationships within supply chains, it would be appropriate to not only survey dyadic pairs, but also triadic groups of firms that belong to a single supply chain.

As stated previously, sampling one side of a relationship is a risk. To be valid, the research findings depend on the absence of false reporting bias. A false reporting bias could exist because many of the shippers on the sample list were obtained from a few principal carrier contacts. This could have possibly resulted in a sample of relationships that are closer since carriers may have only provided names of customers with whom they had good relationships. The survey did not ask about a particular carrier, however, and half asked the respondents to consider a poor relationship. The results were from a nearly equal mix of 'good relationship'/'poor relationship' versions and showed ample variation in each survey item, so this is not expected to be an issue.

Another potential for false reporting bias is the notion that those responding to the survey may not be the most appropriate for the research or they may not know how to answer the questions on the survey but do anyway, creating a bias in the results. To address this, the contacts requested from carriers were the upper-most logistics position with which they dealt. The purpose was to ensure that the respondent was knowledgeable about the relationship – that they were both appropriate and knew how to answer the survey items. The supplemental list from the National Industrial Transportation League consisted of personnel in charge of managing the shipping for their firm; therefore these respondents were knowledgeable and appropriate as well.

Because there was no support for it, false reporting bias does not appear to be an issue. However, a variety of levels (e.g., analyst, manager, director, vice president) of management responded to the survey due to the way in which the sample list was constructed. Different levels of management interact with supplier and customer firms at different levels, and it is possible that they view the relationships with these firms

differently. When analyzing the individual survey scales, significant differences were found between upper levels (e.g., vice presidents) and lower levels of management (supervisors) for some of the trust, commitment, and value items. However, there was no impact on the hypotheses or fit of the theoretical model when tested with the different levels of management. Based on the item differences that were found, this should be explored in future research. Surveys targeting specific management levels should be implemented. In addition, qualitative research should be done to better understand how people in these different positions view the relationship. If there are differences, what drives them?

The conclusions based on the model are only as good as the validity of the measures. The data analysis provided support for the reliability and validity of the measures and scales used in or developed for this survey. However, as is generally the case in survey research, there were some weaknesses with the new measures. Three of the strategy congruence measures seemed to have order effects, and two capability congruence measures cross-loaded on value. The validity and reliability of measures are better concluded through several studies (Mentzer and Flint 1999). The measures in this study need to be tested again on similar as well as different populations than that chosen for this dissertation. The order of the questions should be revised to spatially separate the relationship type and strategy congruence measures. The measures for capability congruence need to be tested on a population where capabilities are not the "price of entry" as the results will likely be different. In addition, a global measure of magnitude should be created and tested to better support its higher order relationship to other constructs.

Another limitation of this dissertation is with the analysis method of structural equation modeling. Causation between or among variables cannot be concluded unless all possible constructs involved in any way with the theory are included in the model to be tested (Anderson and Gerbing 1988). In addition, many alternative models must be tested to ensure that those paths hypothesized to exist are nonzero and those paths that are missing from the theoretical model are zero. It is not feasible to accomplish these conditions within one study.

The conceptual model in this dissertation was deduced from the extant literature, coupled with the results of depth interviews. There was no theoretical basis to test alternatives other than those already included (the first order model, the magnitude alternative model). It is logical to think that other paths that were not hypothesized may be nonzero, for instance from relationship magnitude directly to relationship value. There were also other situational drivers that came out of the qualitative phase of the research that could be added to the model. Additional research is needed to determine if other construct relationships exist within the current framework. If the model is respecified, it needs to be tested with a new sample (Hair et al. 1998). Due to the number of situational drivers, the model could be respecified and retested several times. Antecedents to trust, commitment, and dependence could also be incorporated. Only through several iterations of the model will the conclusion of causation be possible.

Another limitation of a single research study is limited generalizability. This research is no different, especially considering the appropriate but narrow population that was utilized (the shipper-carrier relationship from the shipper's point of view). The study therefore needs to be replicated with other relationships within the supply chain (e.g., a

supplier and manufacturer or manufacturer and distributor). The specific relationship that was examined also limited the research to views about a specific service. Future studies should look at relationships involving other services and products as well. Replication of the results in these other contexts will provide support for extending the conclusions to a broader population.

Aside from addressing the limitations from this study, research stemming from the findings can help further advance the knowledge of interorganizational relationships within the supply chain management, logistics, and marketing domains. Capability congruence and importance were two of the situational drivers that emerged from the qualitative phase of the research. Both showed significant relationships with magnitude; however the path weights were low. The other situational driver tested, strategy congruence, was both significant and high. This deserves further attention to better comprehend the role that these and other drivers play in the structure of the relationship. A qualitative study with both sides of the carrier-shipper relationship would be ideal to obtain a detailed understanding of how the situational drivers truly affect the structure of the relationship.

The constructs of relationship magnitude and relationship type were found to be distinct, yet they were very closely related. As the two were proposed to be components of relationship structure, future research is needed to explore the possibility that structure is a higher order construct (i.e., third order), which is comprised of the dimensions of magnitude and type. A conceptual framework focusing on the phenomenon of structure could be developed and tested. This could also address a possible model path from magnitude to value; perhaps the path is from relationship structure to value.

Finally, more research is needed to help firms measure the value of their relationships. Firms currently use perceptual evaluations to judge whether or not they are getting value from their relationships. There was a surprisingly high path weight between relationship type and value (.83) even though it was at first not known if this relationship would be positive. Either the relationship between these two variables is really strong and positive, or it could be a demand artifact (i.e., a result of influence from the popular press that closer relationships are better). If the result is due to a demand artifact, then helping firms quantitatively measure the value may clarify this. Longitudinal research may be needed to study relationships over time to isolate the resources that are put into relationships and the benefits that come from them. From this, methods to attach costs to these resources should be developed. Metrics could then be formulated to quantify the evaluation of benefits and costs from the relationship to determine the overall value.

## CONCLUDING REMARKS

The primary contribution of this dissertation is that it provides an empirically tested theoretical foundation from which to conduct future research on the components of interorganizational relationship structure. This should benefit both practitioners and academics by creating knowledge for the purpose of helping each understand, explain, and possibly predict outcomes of particular relationship structures.

Practitioners often must justify investments in building closer relationships. It is hoped this research provides a better understanding of the outcomes (i.e., higher value as seen from the customer perspective) of closer relationships and some of the requirements

(strategy congruence, capability congruence, and importance along with higher levels of trust, commitment, and dependence in the relationship) to achieve higher levels.

From a pedagogical perspective it is hoped that the research will add value in the classroom by demonstrating how interorganizational relationships within a supply chain are structured and how this affects value and ultimately the management of those supply chains. Finally, it is anticipated that the dissertation will serve as the beginning of a long and rewarding stream of research examining interorganizational relationships within supply chain management.

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# APPENDICES

# APPENDIX A

# CONTENT ANALYSIS OF QUALITATIVE INTERVIEWS

**CODING SCHEME**

**Interview Questions**

How do firms describe the intensity of their relationships?
What drives a firm to form a particular level of intensity in a relationship with another company? What drives a firm to change a relationship and make it closer or more distant?
What value do firms believe they get from relationships? How do firms measure relationship value?

**Recording Units**

themes or nodes – groups of words, phrases, sentences or paragraphs that explain a thought

**Categories**

*Industry Characteristics* – characteristics or the nature of the business that impacts how the firm operates and the relationships it has
*Measure* – a description of a metric used to measure the value or benefits of a relationship
*Relationship Value* – benefits and/or costs of an interorganizational relationship – be careful to separate measure (an actual metric) from value – **do not** code any text as both of these
*Portfolio* – description provided that demonstrates that a company has a variety of different relationship types or intensities – any indication of different relationships should be coded portfolio
*Situational Drivers* – reasons a company enters a relationship or chooses a particular type or closeness of a relationship
*Relationship Type* – a discussion of a group of relationships having similar structure characteristics such as alliances or partnerships
*Relationship Intensity* – a discussion of the closeness or distance of a relationship – any mention of trust, commitment or interdependence is a sign of intensity – in addition, any mention of collaboration or cooperation is generally intensity

**Coding Rules**

- Include all text necessary to capture the context – if the respondent is expanding on an idea or providing an example, this does not have to be coded unless it seems important
- Not all text needs to be coded into a theme if it is not appropriate
- Pay attention to the question from the interviewer (I) – this often will tell you the code for the answer – **do not** code the question unless you absolutely have to (there will generally be a break between codes at a question
- Attempt to code text into one mutually exclusive theme; however, if it is absolutely necessary, text may have more than one theme (e.g., a description of relationship value which includes a detailed measure)

**INTERVIEW PROTOCOL**

## Opening

- Introductions of researcher and participant(s)
- Purpose of the study
- Assurance of confidentiality

## Demographic Data

- Titles and organizations of participants
- Background on organization, industry
- Number of suppliers
- Number of customers

## Research Questions

- What kinds of relationships do you have with existing suppliers/customers? Are they treated all the same or are they different? If different, what makes them different?
- What would cause you to change a relationship – for instance, make it closer or more transactional?
- How do you decide what kind of relationship to have with a new supplier or customer?
- What value does your company get from a specific relationship?
- How do you measure the value from a relationship?

## Prompts

- Tell me more about that.
- Can you explain that in more detail?
- Can you give me examples?
- How does that work?

# APPENDIX B

# PRETEST SURVEY

**PRENOTIFICATION PROTOCOL**

**If voicemail:**
Hello, this is Susan Golicic, a logistics doctoral student at the University of Tennessee. I got your contact information from _____ (trucking company). They have agreed to help with my dissertation research, which is in the area of business-to-business relationships focusing on relationships in the transportation industry. We would appreciate your participation as well and all that would be required is the completion of a *brief, confidential* survey that would take about 10 minutes.

1st call: I will try again to reach you via telephone. If you have any questions, please call me at the university at 865-974-6397. Thank you for your time.

2nd call: I will be mailing the survey to you within two weeks along with a letter providing more details on the research and a stamped envelope for return. [VERIFY ADDRESS] I would like to thank you in advance for your valuable contribution. If you have any questions or if the address is not correct, please call me at the university at 865-974-6397. Thank you for your time.

**If answer:** [Verify their name]
Hello, this is Susan Golicic, a logistics doctoral student at the University of Tennessee. I got your contact information from _____ (trucking company). They have agreed to help with my dissertation research, which is in the area of business-to-business relationships focusing on relationships in the transportation industry. I would appreciate your participation as well and all that would be required is the completion of a *brief, confidential* survey that would take about 10 minutes. I would like to mail the survey to you within the next two week if that would be okay.

**Yes** – [VERIFY ADDRESS] I will get the survey to you next week. Thank you very much for your help. (Wait for response and end conversation – "have a great day")

**No** – May I ask why not? (Sell - if they say someone else is more appropriate, get contact information; if they say they are too busy, ask if we could email or fax the survey to them – stress that it only takes 10 minutes. If they totally refuse or are rude: I understand, thank you for your time. (Wait for response and end conversation)

**INITIAL SURVEY COVER LETTER**

Date

Name
Company
Address
City, ST Zip

Dear First Name,

I am writing to ask your help in a study of business-to-business relationships. This study is part of an effort to learn how firms structure their relationships and the value they obtain from them. Your contact information was made available to me as I am surveying providers of transportation services and their customers. Results from the survey will be used to help firms determine how to better structure and manage relationships with other supply chain members.

Your answers are completely confidential, and no individual's answers will be identified. When you return your completed questionnaire, your name will be deleted from the mailing list and never connected to your answers in any way. This survey is voluntary. However, by taking 10 minutes to share your opinions on a relationship with a transportation provider, your contribution will greatly strengthen my research.

In return for your valuable response, you will receive summaries of the findings from the research if requested. In addition, $100 donations will be made to the charity of choice for five randomly selected respondents. Those selected will be notified of the contribution.

If you have any questions about this study, I would be happy to talk with you. The telephone number at the university is 865-974-6397 or you can write to me at the address above. Thank you very much for helping with this important study.

Sincerely,

Susan L. Golicic
Ph.D. Candidate

enclosures

**REMINDER POSTCARD**

Last week, we sent you a questionnaire seeking your opinions about business relationships. You were chosen from a list of contacts provided to our research team as someone with valuable information for this important study.

If you have already completed and returned the questionnaire to us, please accept our sincere thanks. If not, please remember that **the survey is due this week**. We are especially grateful for your help because it is only by asking people like you to share your experiences that we can understand more about the factors that impact relationships among businesses.

If you did not receive the questionnaire, or if it was misplaced, please call us at the University at (865) 974-5311, and we will send another one to you immediately.

Thank you!

[sign name]

MLT Research Team
University of Tennessee

**REPLACEMENT COVER LETTER**

Date

Name
Company
Address
City, ST Zip

Dear First Name,

About three weeks ago I sent a brief questionnaire to you that asked about your opinions concerning a business-to-business relationship with a transportation provider. To the best of my knowledge, it's not yet been returned.

The comments of people who have already responded have provided useful insight into how firms structure their relationships and the value they obtain from them. I am writing to you again because of the importance that your questionnaire has for helping to get accurate and representative results in this study.

Your answers are completely confidential, and no individual's answers will be identified. When you return your completed questionnaire, your name will be deleted from the mailing list and never connected to your answers in any way. Protecting the confidentiality of people's answers is very important to me as well as the University.

I hope that you will fill out and return the questionnaire in the envelope provided or via fax very soon. Thank you for helping with this important study.

Sincerely,

Susan L. Golicic
Ph.D. Candidate

enclosures

**PRETEST SURVEY ITEMS**

Respondents are asked to choose their level of agreement or disagreement with all construct questions according to the following scale.

| Strongly Agree 7 | Agree 6 | Somewhat Agree 5 | Neither Agree Or Disagree 4 | Somewhat Disagree 3 | Disagree 2 | Strongly Disagree 1 |
|---|---|---|---|---|---|---|

| Construct | Questions |
|---|---|
| Trust<br><br>the willingness to rely on an exchange partner in whom there is confidence of their honesty and benevolence<br><br>Items from Morgan and Hunt (1994) | 1. In our relationship, the provider…<br>a. has high integrity. [C1]<br>b. can be counted on to do what is right. [C2]<br>c. is sincere in their promises. [C3]<br>d. cannot be trusted at times. [C4]<br>e. treats my firm fairly and justly. [C5]<br>f. is a firm my firm trusts completely. [C6]<br>g. does not show my firm enough consideration. [C7] |
| Commitment<br><br>the willingness to exert effort to continue the relationship<br><br>Items from Morgan and Hunt (1994) | 2. The relationship my firm has with the provider…<br>a. is something my firm is very committed to. [C8]<br>b. is something my firm intends to maintain indefinitely. [C9]<br>c. deserves my firm's maximum effort to maintain. [C10]<br>d. is something my firm would do almost anything to keep. [C11]<br>e. is something my firm cares a great deal about long-term. [C12]<br>f. could be ended with very little effort. [C13] |
| Dependence<br><br>the perception of the need for one party to maintain the relationship to achieve desired goals | 3. My firm…<br>a. Could easily replace the provider. [C14]<br>b. is dependent upon the provider. [C15]<br>c. believes the provider is crucial to our success. [C16]<br>d. does not have a good alternative to the provider. [C17] |

| | |
|---|---|
| Items from Ganesan (1994) | e. needs the provider to accomplish our goals. [C18]<br><br>f. does not depend on the service of the provider. [C19] |
| <u>Relationship type</u><br><br>the group or class of relationships that share common traits or characteristics<br><br>First three items from Boyle et al. (1992); the others are new items using Webster (1992) and Mentzer et al. (2001) | 4. The continuation of the relationship with the provider is important to my firm. [C20]<br><br>5. The business relationship my firm has with the provider could better be described as "cooperative" rather than an "arm's length." [C21]<br><br>6. The business relationship my firm has with the provider could better be described as an "integrated" rather than a "cooperative." [C22]<br><br>7. My firm feels little obligation to use the provider for further transactions. [C23]<br><br>8. My firm and the provider strategically coordinate our business functions as if we were one company. [C24]<br><br>9. My firm's relationship with the provider is more than just repeat transactions. [C25]<br><br>10. My firm's relationship with the provider could better be described as "strategic" than "transactional." [C26] |
| <u>Strategy congruence</u><br><br>the perception of the match between the strategies of the two parties<br><br>New items from qualitative study | 11. My firm and the provider have common goals. [C27]<br><br>12. There is a match between my firm's philosophies and those of the provider. [C28]<br><br>13. The provider has a business strategy that is very different from that of my firm. [C29]<br><br>14. My firm does not believe there is a match between our goals and those of the provider. [C30]<br><br>15. My firm's transportation strategy is aligned with that of the provider. [C31] |
| <u>Capability congruence</u><br><br>the perception of a match between the capabilities and needs of the two parties | 16. The provider has the capabilities that my firm needs. [C32]<br><br>17. My firm and the provider obtain the appropriate resources to accommodate each other's needs. [C33]<br><br>18. My firm and the provider often share resources that one or the other has. [C34] |

| | |
|---|---|
| New items from qualitative study | 20. The provider does not bring any unique capabilities to my firm. [C36] |
| Importance<br><br>the perception of the significance of one party by the other party in the relationship<br><br>New items from qualitative study | 21. My firm does a great deal of business with the provider. [C37]<br><br>22. The provider carries a relatively large percentage of my firm's freight. [C38]<br><br>23. My firm does not use the provider often. [C39]<br><br>24. My firm frequently uses the provider to ship our freight. [C40]<br><br>25. My firm uses the provider as little as possible. [C41] |
| Relationship value<br><br>the perception of benefits received versus costs sacrificed from the relationship<br><br>New items from qualitative study | 26. My firm receives a great deal of benefits from the relationship with the provider. [C42]<br><br>27. The costs to my firm for the relationship with the provider do not justify the benefits we receive. [C43]<br><br>28. My firm puts too much time and effort into the relationship with the provider. [C44]<br><br>29. My firm receives more benefits from the relationship with the provider than costs put into maintaining it. [C45]<br><br>30. My firm gets a lot of value from the relationship with the provider. [C46] |

Demographic Questions

31. How long has this company been a trucking provider for your firm?
    - o Less than 6 months
    - o 7-12 months
    - o 1-3 years
    - o More than 3 years

32. How many years have you personally been dealing with the provider?
    - o Less than 6 months
    - o 7-12 months
    - o 1-3 years
    - o More than 3 years

33. What is the approximate percentage of your freight volume carried by the provider?
    - o Less than 10%
    - o 10-20%
    - o 21-40%
    - o 41-60%
    - o Greater than 60%

34. Approximately how many transportation providers does your firm use?
    - o Less than 5
    - o 6-20
    - o 21-50
    - o Greater than 50

35. Which term best describes your firm's position in the supply chain?
    - o Retailer
    - o Wholesaler or distributor
    - o Manufacturer
    - o Supplier to a manufacturer

36. Which term best describes your firm's industry?
    - o Automotive
    - o Apparel/textiles
    - o Electronics
    - o Chemicals/plastics
    - o Medical/pharmaceutical
    - o Consumer packaged goods
    - o Industrial products
    - o Other

37. What is your firm's approximate annual sales revenue?
    - o Less than $1 million
    - o $1-50 million
    - o $51-500 million
    - o $501 million - $1 billion
    - o Greater than $1 billion

38. Please provide your job title and general responsibilities.

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# APPENDIX C

# PRETEST RESULTS

**TESTS OF NORMALITY**

| | Kolmogorov-Smirnov Statistic | df | Sig. | Shapiro-Wilk Statistic | df | Sig. |
|---|---|---|---|---|---|---|
| C1 | .282 | 40 | .000 | .867 | 40 | .000 |
| C2 | .233 | 40 | .000 | .863 | 40 | .000 |
| C3 | .176 | 40 | .003 | .922 | 40 | .009 |
| C4 | .233 | 40 | .000 | .892 | 40 | .001 |
| C5 | .275 | 40 | .000 | .838 | 40 | .000 |
| C6 | .198 | 40 | .000 | .914 | 40 | .005 |
| C7 | .256 | 40 | .000 | .883 | 40 | .001 |
| C8 | .204 | 40 | .000 | .895 | 40 | .001 |
| C9 | .199 | 40 | .000 | .913 | 40 | .005 |
| C10 | .207 | 40 | .000 | .928 | 40 | .013 |
| C11 | .150 | 40 | .024 | .934 | 40 | .021 |
| C12 | .214 | 40 | .000 | .915 | 40 | .005 |
| C13 | .202 | 40 | .000 | .908 | 40 | .003 |
| C14 | .233 | 40 | .000 | .896 | 40 | .002 |
| C15 | .193 | 40 | .001 | .915 | 40 | .005 |
| C16 | .192 | 40 | .001 | .903 | 40 | .002 |
| C17 | .305 | 40 | .000 | .829 | 40 | .000 |
| C18 | .166 | 40 | .007 | .913 | 40 | .005 |
| C19 | .211 | 40 | .000 | .885 | 40 | .001 |
| C20 | .184 | 40 | .002 | .903 | 40 | .002 |
| C21 | .281 | 40 | .000 | .857 | 40 | .000 |
| C22 | .151 | 40 | .023 | .884 | 40 | .001 |
| C23 | .193 | 40 | .001 | .911 | 40 | .004 |
| C24 | .200 | 40 | .000 | .902 | 40 | .002 |
| C25 | .240 | 40 | .000 | .875 | 40 | .000 |
| C26 | .223 | 40 | .000 | .925 | 40 | .011 |
| C27 | .217 | 40 | .000 | .890 | 40 | .001 |
| C28 | .222 | 40 | .000 | .906 | 40 | .003 |
| C29 | .243 | 40 | .000 | .898 | 40 | .002 |
| C30 | .204 | 40 | .000 | .912 | 40 | .004 |
| C31 | .229 | 40 | .000 | .862 | 40 | .000 |
| C32 | .246 | 40 | .000 | .858 | 40 | .000 |
| C33 | .209 | 40 | .000 | .884 | 40 | .001 |
| C34 | .196 | 40 | .000 | .914 | 40 | .005 |
| C35 | .208 | 40 | .000 | .911 | 40 | .004 |
| C36 | .199 | 40 | .000 | .930 | 40 | .016 |
| C37 | .245 | 40 | .000 | .869 | 40 | .000 |
| C38 | .276 | 40 | .000 | .896 | 40 | .001 |
| C39 | .251 | 40 | .000 | .855 | 40 | .000 |
| C40 | .238 | 40 | .000 | .831 | 40 | .000 |
| C41 | .219 | 40 | .000 | .846 | 40 | .000 |
| C42 | .176 | 40 | .003 | .904 | 40 | .002 |
| C43 | .201 | 40 | .000 | .912 | 40 | .004 |
| C44 | .273 | 40 | .000 | .865 | 40 | .000 |
| C45 | .210 | 40 | .000 | .933 | 40 | .020 |
| C46 | .212 | 40 | .000 | .910 | 40 | .004 |

## DESCRIPTIVE STATISTICS

| | Mean | Std. Deviation | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|
| | Statistic | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| C1 | 5.48 | 1.301 | -.899 | .374 | .171 | .733 |
| C2 | 5.38 | 1.314 | -.890 | .374 | .199 | .733 |
| C3 | 5.22 | 1.291 | -.443 | .374 | -.326 | .733 |
| C4 | 3.23 | 1.747 | .639 | .374 | -.677 | .733 |
| C5 | 5.22 | 1.476 | -1.215 | .374 | .985 | .733 |
| C6 | 4.68 | 1.774 | -.579 | .374 | -.527 | .733 |
| C7 | 2.88 | 1.418 | .687 | .374 | -.491 | .733 |
| C8 | 5.08 | 1.457 | -.660 | .374 | -.013 | .733 |
| C9 | 4.82 | 1.430 | -.728 | .374 | .522 | .733 |
| C10 | 4.57 | 1.567 | -.462 | .374 | -.419 | .733 |
| C11 | 3.47 | 1.754 | .239 | .374 | -.914 | .733 |
| C12 | 4.70 | 1.620 | -.436 | .374 | -.834 | .733 |
| C13 | 3.63 | 1.931 | .295 | .374 | -1.176 | .733 |
| C14 | 4.75 | 1.706 | -.795 | .374 | -.071 | .733 |
| C15 | 3.77 | 1.874 | -.074 | .374 | -1.274 | .733 |
| C16 | 4.35 | 1.791 | -.221 | .374 | -1.271 | .733 |
| C17 | 2.75 | 1.391 | .834 | .374 | -.462 | .733 |
| C18 | 4.32 | 1.859 | -.327 | .374 | -1.086 | .733 |
| C19 | 3.15 | 1.819 | .707 | .374 | -.609 | .733 |
| C20 | 4.90 | 1.566 | -.754 | .374 | -.023 | .733 |
| C21 | 5.50 | 1.062 | -1.014 | .374 | 1.630 | .733 |
| C22 | 4.02 | 1.441 | -.100 | .374 | -1.263 | .733 |
| C23 | 3.25 | 1.532 | .366 | .374 | -.970 | .733 |
| C24 | 3.40 | 1.661 | .131 | .374 | -1.320 | .733 |
| C25 | 4.38 | 1.462 | -.491 | .374 | -.842 | .733 |
| C26 | 4.10 | 1.482 | -.379 | .374 | -.395 | .733 |
| C27 | 4.70 | 1.285 | -.699 | .374 | -.054 | .733 |
| C28 | 4.25 | 1.276 | -.263 | .374 | -.241 | .733 |
| C29 | 3.35 | 1.292 | .049 | .374 | -.755 | .733 |
| C30 | 3.00 | 1.301 | .147 | .374 | -.802 | .733 |
| C31 | 4.60 | 1.215 | -.787 | .374 | -.010 | .733 |
| C32 | 5.40 | 1.172 | -1.053 | .374 | 1.127 | .733 |
| C33 | 4.35 | 1.902 | -.133 | .374 | -1.424 | .733 |
| C34 | 3.33 | 1.526 | .100 | .374 | -.949 | .733 |
| C35 | 5.15 | 1.369 | -.600 | .374 | -.263 | .733 |
| C36 | 3.63 | 1.628 | .271 | .374 | -.938 | .733 |
| C37 | 4.92 | 1.509 | -.951 | .374 | .158 | .733 |
| C38 | 4.45 | 1.709 | -.494 | .374 | -.712 | .733 |
| C39 | 2.60 | 1.549 | .892 | .374 | -.183 | .733 |
| C40 | 5.23 | 1.441 | -1.336 | .374 | 1.664 | .733 |
| C41 | 2.23 | 1.291 | .988 | .374 | .508 | .733 |
| C42 | 4.13 | 1.453 | -.387 | .374 | -.904 | .733 |
| C43 | 2.92 | 1.366 | .587 | .374 | -.332 | .733 |
| C44 | 2.93 | 1.385 | .995 | .374 | .707 | .733 |
| C45 | 4.35 | 1.252 | .277 | .374 | -.415 | .733 |
| C46 | 4.70 | 1.471 | -.262 | .374 | -1.068 | .733 |

## UNIDIMENSIONALITY TESTS

| | Factor 1 |
|---|---|
| C1 | .943 |
| C2 | .947 |
| C3 | .860 |
| C4 | -.400 |
| C5 | .641 |
| C6 | .782 |
| C7 | -.700 |

One factor explains variance (60%).

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 24.875 | 14 | .036 |

| | Factor 1 |
|---|---|
| C8 | .902 |
| C9 | .858 |
| C10 | .774 |
| C11 | .707 |
| C12 | .840 |
| C13 | -.465 |

One factor explains variance (60%).

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 26.732 | 9 | .002 |

| | Factor 1 |
|---|---|
| C14 | -.462 |
| C15 | .835 |
| C16 | .652 |
| C17 | .333 |
| C18 | .725 |
| C19 | -.684 |

Two factors explain variance (one if C14 and C17 are removed at 53% however these are needed to tap the construct definition).

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 18.090 | 9 | .034 |

| | Factor 1 |
|---|---|
| C20 | .790 |
| C21 | .628 |
| C22 | .585 |
| C23 | -.440 |
| C24 | .537 |
| C25 | .681 |
| C26 | .701 |

Two factors explain variance (one if C23 is removed at 44%).

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 38.492 | 14 | .000 |

| | Factor 1 | |
|---|---|---|
| C27 | .784 | One factor explains variance (43%). |
| C28 | .761 | |
| C29 | -.651 | |
| C30 | -.516 | |
| C31 | .505 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 16.329 | 5 | .006 |

| | Factor 1 | |
|---|---|---|
| C32 | .718 | Two factors explain variance (one if C34 is removed at 52%). |
| C33 | -.767 | |
| C34 | 6.736E-02 | |
| C35 | .782 | |
| C36 | -.587 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 11.757 | 5 | .038 |

| | Factor 1 | |
|---|---|---|
| C37 | .850 | One factor explains variance (54%). |
| C38 | .828 | |
| C39 | -.792 | |
| C40 | .580 | |
| C41 | -.582 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 12.793 | 5 | .025 |

| | Factor 1 | |
|---|---|---|
| C42 | .770 | One factor explains variance (56%). |
| C43 | -.752 | |
| C44 | -.373 | |
| C45 | .803 | |
| C46 | .925 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 8.289 | 5 | .141 |

## CONFIRMATORY FACTOR ANALYSIS LOADINGS

| | VAL/CC | TRU | COM | IMP | SCON | DEP | TYP | 8 |
|---|---|---|---|---|---|---|---|---|
| C1 | .142 | .768 | 7.71E-03 | -.162 | 1.933E-02 | 6.273E-02 | 2.265E-02 | .272 |
| C2 | .103 | .868 | -5.51E-02 | -.101 | 1.305E-02 | 7.037E-02 | -9.17E-03 | .181 |
| C3 | 3.442E-02 | .841 | -6.87E-02 | -3.11E-02 | .116 | .125 | 9.658E-02 | -.115 |
| C5 | -1.69E-03 | .701 | 6.136E-02 | -3.08E-02 | .138 | -5.75E-02 | -.127 | 7.027E-02 |
| C6 | .360 | .598 | .138 | -.105 | .110 | -.149 | -4.90E-02 | -6.83E-02 |
| C8 | .477 | 5.522E-02 | .547 | 6.952E-02 | -6.41E-02 | -1.88E-02 | 8.615E-02 | -4.47E-02 |
| C9 | .401 | .236 | .475 | -4.75E-02 | -5.94E-02 | -9.54E-02 | 1.474E-02 | .105 |
| C10 | -.119 | .394 | .624 | 3.968E-02 | -.114 | 9.269E-02 | .165 | -.107 |
| C11 | 3.280E-02 | .154 | .654 | .155 | -.116 | -8.91E-02 | .166 | 5.359E-02 |
| C12 | -1.89E-03 | .262 | .710 | 3.371E-02 | -6.88E-03 | .102 | -.112 | 9.382E-02 |
| C14 | 4.524E-02 | -9.33E-02 | -7.43E-02 | -.267 | .412 | -.479 | -.298 | .101 |
| C15 | -.149 | 3.094E-02 | .179 | -2.28E-02 | -.128 | 1.027 | -6.43E-02 | -4.46E-02 |
| C16 | .101 | -.197 | .605 | -8.20E-02 | .206 | .355 | -.104 | .101 |
| C17 | -5.62E-03 | -.173 | .673 | -.154 | -2.84E-02 | 7.402E-02 | .230 | 7.776E-02 |
| C18 | -9.19E-02 | 8.720E-02 | .328 | -1.88E-02 | .264 | .474 | -.115 | 8.767E-02 |
| C21 | .107 | .252 | .319 | .125 | 4.810E-02 | -2.90E-02 | 3.106E-02 | .584 |
| C22 | .169 | -.310 | .483 | -.221 | .241 | 8.922E-03 | .517 | 7.848E-02 |
| C24 | -5.11E-02 | -6.67E-02 | .332 | 7.795E-02 | .830 | -.165 | -7.82E-02 | -9.09E-02 |
| C25 | -.267 | .191 | .265 | .275 | .223 | 5.160E-02 | .209 | -.173 |
| C26 | -.178 | 2.001E-02 | .289 | -.148 | .224 | -6.59E-02 | .909 | -1.78E-02 |
| C27 | -.104 | .247 | -3.16E-02 | .144 | .782 | -.164 | 8.061E-02 | 6.869E-02 |
| C28 | .128 | 1.723E-02 | .151 | -3.03E-02 | .577 | -.184 | .176 | -5.17E-02 |
| C29 | -.310 | -.105 | .295 | .113 | -.512 | -7.97E-02 | -.145 | 3.883E-02 |
| C30 | 6.992E-02 | -.123 | .261 | 3.016E-02 | -.437 | -.291 | -.162 | -.110 |
| C31 | -.185 | -5.44E-03 | .233 | .249 | .329 | 5.779E-02 | .284 | .220 |
| C32 | .800 | -1.68E-03 | .285 | -.268 | -3.44E-02 | 6.941E-02 | -.154 | 9.894E-02 |
| C33 | -.654 | -.315 | -3.72E-02 | .130 | 8.400E-02 | 3.817E-02 | .173 | .237 |
| C35 | .567 | 5.246E-02 | -4.03E-02 | 8.096E-02 | .121 | 4.078E-02 | -.240 | 7.511E-02 |
| C36 | -.346 | -.175 | .209 | -5.37E-03 | -.385 | -.221 | -3.76E-02 | .456 |
| C37 | -1.70E-02 | -.205 | -6.71E-02 | .916 | .185 | 1.190E-02 | -5.50E-02 | -9.06E-02 |
| C38 | .206 | -.333 | .158 | .780 | 5.766E-02 | .157 | -.198 | -7.64E-02 |
| C39 | -.149 | 5.592E-02 | .229 | -.911 | 6.060E-02 | 9.042E-02 | -4.41E-02 | -.251 |
| C40 | -.242 | .186 | .186 | .677 | -.128 | -.156 | -.188 | .180 |
| C41 | -7.67E-02 | -.192 | .139 | -.518 | -9.14E-02 | -6.36E-02 | 5.292E-02 | -.434 |
| C42 | .409 | -2.30E-02 | 3.497E-02 | .415 | 3.852E-02 | .276 | -7.55E-03 | 3.964E-02 |
| C43 | -.846 | -9.25E-02 | .147 | -.149 | -1.66E-02 | .213 | -9.31E-03 | 2.381E-02 |
| C45 | .745 | -.127 | .163 | .199 | -9.59E-02 | -.161 | .265 | 6.486E-02 |
| C46 | .600 | .182 | -6.05E-03 | .242 | 6.027E-02 | 4.657E-02 | 3.829E-02 | 5.942E-02 |

Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.

Factor Correlation Matrix

| Factor | VAL/CC | TRU | COM | IMP | SCON | DEP | TYP | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 | 1.000 | | | | | | | |
| 2 | .533 | 1.000 | | | | | | |
| 3 | .382 | .436 | 1.000 | | | | | |
| 4 | .295 | .373 | .343 | 1.000 | | | | |
| 5 | .503 | .299 | .362 | .118 | 1.000 | | | |
| 6 | .371 | .273 | .208 | .391 | .412 | 1.000 | | |
| 7 | .288 | .272 | .148 | .267 | .245 | .267 | 1.000 | |
| 8 | .173 | -8.13E-03 | 2.196E-02 | 4.475E-02 | .124 | 4.910E-02 | .152 | 1.000 |

## RELIABILITY TESTS

Trust Correlation Matrix

| | C1 | C2 | C3 | C5 | C6 |
|---|---|---|---|---|---|
| C1 | 1.0000 | | | | |
| C2 | .9131 | 1.0000 | | | |
| C3 | .7900 | .7954 | 1.0000 | | |
| C5 | .5840 | .6030 | .6187 | 1.0000 | |
| C6 | .7242 | .6913 | .7717 | .5475 | 1.0000 |

Alpha = .9145 Standardized item alpha = .9224

Commitment Correlation Matrix

| | C8 | C9 | C10 | C11 | C12 |
|---|---|---|---|---|---|
| C8 | 1.0000 | | | | |
| C9 | .8556 | 1.0000 | | | |
| C10 | .6882 | .5380 | 1.0000 | | |
| C11 | .5978 | .5246 | .6910 | 1.0000 | |
| C12 | .7158 | .7070 | .7260 | .6288 | 1.0000 |

Alpha = .9065 Standardized item alpha = .9093

Dependence Correlation Matrix

| | C14 | C15 | C16 | C17 | C18 |
|---|---|---|---|---|---|
| C14 | 1.0000 | | | | |
| C15 | -.5233 | 1.0000 | | | |
| C16 | -.1133 | .4671 | 1.0000 | | |
| C17 | -.1458 | .2040 | .4064 | 1.0000 | |
| C18 | -.2405 | .5662 | .6812 | .2900 | 1.0000 |

Alpha = .4981 Standardized item alpha = .4863

Type Correlation Matrix

| | C21 | C22 | C24 | C25 | C26 |
|---|---|---|---|---|---|
| C21 | 1.0000 | | | | |
| C22 | .4105 | 1.0000 | | | |
| C24 | .3052 | .4564 | 1.0000 | | |
| C25 | .3054 | .2023 | .3801 | 1.0000 | |
| C26 | .4074 | .7315 | .3272 | .5031 | 1.0000 |

Alpha = .7672 Standardized item alpha = .7714

Strategy Congruence Correlation Matrix

| | C27 | C28 | C29 | C30 | C31 |
|---|---|---|---|---|---|
| C27 | 1.0000 | | | | |
| C28 | .6099 | 1.0000 | | | |
| C29 | -.5066 | -.4588 | 1.0000 | | |
| C30 | -.3221 | -.2935 | .5950 | 1.0000 | |
| C31 | .3973 | .4299 | -.1698 | -.4217 | 1.0000 |

Alpha = -.0888 Standardized item alpha = -.0744

Capability Congruence Correlation Matrix

| | C32 | C33 | C35 | C36 |
|---|---|---|---|---|
| C32 | 1.0000 | | | |
| C33 | -.5358 | 1.0000 | | |
| C35 | .6167 | -.5721 | 1.0000 | |
| C36 | -.3359 | .5485 | -.4228 | 1.0000 |

Alpha = -.6624 Standardized item alpha = -.7200

Importance Correlation Matrix

| | C37 | C38 | C39 | C40 | C41 |
|---|---|---|---|---|---|
| C37 | 1.0000 | | | | |
| C38 | .7692 | 1.0000 | | | |
| C39 | -.6494 | -.5888 | 1.0000 | | |
| C40 | .4679 | .4368 | -.5789 | 1.0000 | |
| C41 | -.3861 | -.4656 | .6360 | -.3450 | 1.0000 |

Alpha = -.4262 Standardized item alpha = -.4899

Value Correlation Matrix

| | C42 | C43 | C45 | C46 |
|---|---|---|---|---|
| C42 | 1.0000 | | | |
| C43 | -.4859 | 1.0000 | | |
| C45 | .6378 | -.6291 | 1.0000 | |
| C46 | .7376 | -.7005 | .7269 | 1.0000 |

Alpha = .1867 Standardized item alpha = .1672

## RELIABILITY TESTS

| Item | Lambda (ABS) | Lambda squared | Meas Error | Construct Reliability > 0.70 | Variance Extracted > 0.50 |
|---|---|---|---|---|---|
| C1 | 0.938 | 0.880 | 0.120 | | |
| C2 | 0.938 | 0.880 | 0.120 | | |
| C3 | 0.868 | 0.753 | 0.247 | | |
| C5 | 0.657 | 0.432 | 0.568 | | |
| C6 | 0.798 | 0.637 | 0.363 | | |
| Trust | 4.199 | 3.582 | 1.418 | 0.926 | 0.716 |
| C8 | 0.923 | 0.852 | 0.148 | | |
| C9 | 0.859 | 0.738 | 0.262 | | |
| C10 | 0.762 | 0.581 | 0.419 | | |
| C11 | 0.698 | 0.487 | 0.513 | | |
| C12 | 0.824 | 0.679 | 0.321 | | |
| Commitment | 4.066 | 3.337 | 1.663 | 0.909 | 0.667 |
| C14 | 0.276 | 0.076 | 0.924 | | |
| C15 | 0.585 | 0.342 | 0.658 | | |
| C16 | 0.848 | 0.719 | 0.281 | | |
| C17 | 0.489 | 0.239 | 0.761 | | |
| C18 | 0.790 | 0.624 | 0.376 | | |
| Dependence | 2.988 | 2.001 | 2.999 | 0.749 | 0.400 |
| C21 | 0.615 | 0.378 | 0.622 | | |
| C22 | 0.664 | 0.441 | 0.559 | | |
| C24 | 0.720 | 0.518 | 0.482 | | |
| C25 | 0.505 | 0.255 | 0.745 | | |
| C26 | 0.635 | 0.403 | 0.597 | | |
| Type | 3.139 | 1.996 | 3.004 | 0.766 | 0.399 |
| C27 | 0.790 | 0.624 | 0.376 | | |
| C28 | 0.706 | 0.498 | 0.502 | | |
| C29 | 0.622 | 0.387 | 0.613 | | |
| C30 | 0.513 | 0.263 | 0.737 | | |
| C31 | 0.590 | 0.348 | 0.652 | | |
| Strategy Con | 3.221 | 2.121 | 2.879 | 0.783 | 0.424 |
| C32 | 0.809 | 0.654 | 0.346 | | |
| C33 | 0.744 | 0.554 | 0.446 | | |
| C35 | 0.670 | 0.449 | 0.551 | | |
| C36 | 0.590 | 0.348 | 0.652 | | |
| Capability Con | 2.813 | 2.005 | 1.995 | 0.799 | 0.501 |
| C37 | 0.732 | 0.536 | 0.464 | | |
| C38 | 0.701 | 0.491 | 0.509 | | |
| C39 | 0.914 | 0.835 | 0.165 | | |
| C40 | 0.603 | 0.364 | 0.636 | | |
| C41 | 0.677 | 0.458 | 0.542 | | |

| | | | | | |
|---|---|---|---|---|---|
| Importance | 3.627 | 2.685 | 2.315 | 0.850 | 0.537 |
| C42 | 0.788 | 0.621 | 0.379 | | |
| C43 | 0.756 | 0.572 | 0.428 | | |
| C45 | 0.783 | 0.613 | 0.387 | | |
| C46 | 0.924 | 0.854 | 0.146 | | |
| Value | 3.251 | 2.659 | 1.341 | 0.887 | 0.665 |

## CONVERGENT VALIDITY

| Item | Lambda | Significance |
|---|---|---|
| C1 | 0.938 | 0.000 |
| C2 | 0.938 | 0.000 |
| C3 | 0.868 | 0.000 |
| C5 | 0.657 | 0.000 |
| C6 | 0.798 | 0.000 |
| C8 | 0.923 | 0.000 |
| C9 | 0.859 | 0.000 |
| C10 | 0.762 | 0.000 |
| C11 | 0.698 | 0.000 |
| C12 | 0.824 | 0.000 |
| C14 | -0.276 | 0.102 |
| C15 | 0.585 | 0.000 |
| C16 | 0.848 | 0.000 |
| C17 | 0.489 | 0.002 |
| C18 | 0.790 | 0.000 |
| C21 | 0.615 | 0.000 |
| C22 | 0.664 | 0.000 |
| C24 | 0.720 | 0.000 |
| C25 | 0.505 | 0.001 |
| C26 | 0.635 | 0.000 |
| C27 | 0.790 | 0.000 |
| C28 | 0.706 | 0.000 |
| C29* | -0.622 | 0.000 |
| C30* | -0.513 | 0.001 |
| C31 | 0.590 | 0.000 |
| C32 | 0.809 | 0.000 |
| C33* | -0.744 | 0.000 |
| C35 | 0.670 | 0.000 |
| C36* | -0.590 | 0.000 |
| C37 | 0.732 | 0.000 |
| C38 | 0.701 | 0.000 |
| C39* | -0.914 | 0.000 |
| C40 | 0.603 | 0.000 |
| C41* | -0.677 | 0.000 |
| C42 | 0.788 | 0.000 |
| C43* | -0.756 | 0.000 |
| C45 | 0.783 | 0.000 |
| C46 | 0.924 | 0.000 |

* Negatively worded items.

## DISCRIMINANT VALIDITY

| Item Pair | Chi-square Difference | Chi-square Value | |
|---|---|---|---|
| I-v | 37.874 | 7.54643E-10 | *** |
| cc-v | 9.017 | 0.002674801 | |
| cc-I | 44.4 | 2.67687E-11 | *** |
| sc-v | 20.779 | 5.15451E-06 | ** |
| sc-I | 39.243 | 3.74208E-10 | *** |
| sc-cc | 19.972 | 7.85845E-06 | ** |
| ty-v | 21.819 | 2.99618E-06 | ** |
| ty-I | 39.119 | 3.98745E-10 | *** |
| ty-cc | 26.544 | 2.57604E-07 | *** |
| ty-sc | 2.59 | 0.107540363 | |
| d-v | 28.802 | 8.01683E-08 | *** |
| d-I | 30.022 | 4.27172E-08 | *** |
| d-cc | 28.512 | 9.31196E-08 | *** |
| d-sc | 21.824 | 2.98839E-06 | ** |
| d-ty | 13.664 | 0.000218605 | |
| c-v | 32.513 | 1.18398E-08 | ** |
| c-I | 65.1 | 7.11921E-16 | *** |
| c-cc | 21.1 | 4.35928E-06 | ** |
| c-sc | 29.461 | 5.70533E-08 | *** |
| c-ty | 8.365 | 0.003825166 | |
| c-d | 16.825 | 4.09897E-05 | |
| t-v | 50.101 | 1.46033E-12 | *** |
| t-I | 72.3 | 1.84847E-17 | *** |
| t-cc | 21.1 | 4.35928E-06 | ** |
| t-sc | 29.777 | 4.84708E-08 | *** |
| t-ty | 28.871 | 7.73626E-08 | *** |
| t-d | 38.221 | 6.31689E-10 | *** |
| t-c | 61 | 5.70748E-15 | *** |

** significant at .005
*** significant at .001

# APPENDIX D

# FINAL SURVEY

**PRENOTIFICATION PROTOCOL**

**If voicemail:**
Hello, this is _____ (name) and I am calling on behalf of Susan Golicic, a logistics doctoral student at the University of Tennessee. We got your contact information from _____ (trucking company). They have agreed to help with Susan's dissertation research, which is in the area of business-to-business relationships focusing on relationships in the transportation industry. We would appreciate your participation as well and all that would be required is the completion of a *brief, confidential* survey that would take about 10 minutes.

1st call: I will try again to reach you via telephone. If you have any questions, please call Susan at the university at 865-974-6397. Thank you for your time.

2nd call: We will be mailing the survey to you within two weeks along with a letter providing more details on the research and a stamped envelope for return. [VERIFY ADDRESS] We would like to thank you in advance for your valuable contribution. If you have any questions or if the address is not correct, please call Susan at the university at 865-974-6397. Thank you for your time.

**If answer:** [Verify their name]
Hello, this is_____ (name) and I am calling on behalf of Susan Golicic, a logistics doctoral student at the University of Tennessee. We got your contact information from _____ (trucking company). They have agreed to help with Susan's dissertation research, which is in the area of business-to-business relationships focusing on relationships in the transportation industry. We would appreciate your participation as well and all that would be required is the completion of a *brief, confidential* survey that would take about 10 minutes. We would like to mail the survey to you within the next two week if that would be okay.

**Yes** – [VERIFY ADDRESS] We will get the survey to you next week. Thank you very much for your help. (Wait for response and end conversation – "have a great day")

**No** – May I ask why not? (Sell - if they say someone else is more appropriate, get contact information; if they say they are too busy, ask if we could email or fax the survey to them – stress that it only takes 10 minutes. If they totally refuse or are rude: I understand, thank you for your time. (Wait for response and end conversation)

**INITIAL SURVEY COVER LETTER**

Date

Name
Company
Address
City, ST Zip

Dear First Name,

I am writing to ask your help in a study of business-to-business relationships. This study is part of an effort to learn how firms structure their relationships and the value they obtain from them. Your contact information was made available to me as I am surveying providers of transportation services and their customers. Results from the survey will be used to help firms determine how to better structure and manage relationships with other supply chain members.

Your answers are completely confidential, and no individual's answers will be identified. When you return your completed questionnaire, your name will be deleted from the mailing list and never connected to your answers in any way. This survey is voluntary. However, by taking 10 minutes to share your opinions on a relationship with a transportation provider, your contribution will greatly strengthen my research.

In return for your valuable response, you will receive summaries of the findings from the research if requested. In addition, $100 donations will be made to the charity of choice for five randomly selected respondents. Those selected will be notified of the contribution.

If you have any questions about this study, I would be happy to talk with you. The telephone number at the university is 865-974-6397 or you can write to me at the address above. Thank you very much for helping with this important study.

Sincerely,

Susan L. Golicic
Ph.D. Candidate

enclosures

**REMINDER POSTCARD**

Last week, we sent you a questionnaire seeking your opinions about business relationships. You were chosen from a list of contacts provided to our research team as someone with valuable information for this important study.

If you have already completed and returned the questionnaire to us, please accept our sincere thanks. If not, please remember that **the survey is due this week**. We are especially grateful for your help because it is only by asking people like you to share your experiences that we can understand more about the factors that impact relationships among businesses.

If you did not receive the questionnaire, or if it was misplaced, please call us at the University at (865) 974-5311, and we will send another one to you immediately.

Thank you!

[sign name]

MLT Research Team
University of Tennessee

**REPLACEMENT COVER LETTER**

Date

Name
Company
Address
City, ST Zip

Dear First Name,

About three weeks ago I sent a brief questionnaire to you that asked about your opinions concerning a business-to-business relationship with a transportation provider. To the best of my knowledge, it's not yet been returned.

The comments of people who have already responded have provided useful insight into how firms structure their relationships and the value they obtain from them. I am writing to you again because of the importance that your questionnaire has for helping to get accurate and representative results in this study.

Your answers are completely confidential, and no individual's answers will be identified. When you return your completed questionnaire, your name will be deleted from the mailing list and never connected to your answers in any way. Protecting the confidentiality of people's answers is very important to me as well as the University.

I hope that you will fill out and return the questionnaire in the envelope provided or via fax very soon. Thank you for helping with this important study.

Sincerely,

Susan L. Golicic
Ph.D. Candidate

enclosures

**FINAL SURVEY ITEMS**

Respondents are asked to choose their level of agreement or disagreement with all construct questions according to the following scale.

| Strongly Agree 7 | Agree 6 | Somewhat Agree 5 | Neither Agree Or Disagree 4 | Somewhat Disagree 3 | Disagree 2 | Strongly Disagree 1 |
|---|---|---|---|---|---|---|

| Construct | Questions |
|---|---|
| Trust<br><br>the willingness to rely on an exchange partner in whom there is confidence of their honesty and benevolence<br><br>Items from Morgan and Hunt (1994) | 1. In our relationship, the provider…<br>a. has high integrity. [C1]<br>b. can be counted on to do what is right. [C2]<br>c. is sincere in their promises. [C3]<br>d. treats my firm fairly and justly. [C5]<br>e. is a firm my firm trusts completely. [C6] |
| Commitment<br>the willingness to exert effort to continue the relationship<br><br>Items from Morgan and Hunt (1994) | 2. The relationship my firm has with the provider…<br>a. is something my firm is very committed to. [C8]<br>b. is something my firm intends to maintain indefinitely. [C9]<br>c. deserves my firm's maximum effort to maintain. [C10]<br>d. is something my firm would do almost anything to keep. [C11]<br>**e.** is something my firm cares a great deal about long-term. [C12] |
| Dependence<br>the perception of the need for one party to maintain the relationship to achieve desired goals | 3. My firm…<br>a. could easily replace the provider. [C14]<br>b. is dependent upon the provider. [C15]<br>c. believes the provider is crucial to our success. [C16] |

| | |
|---|---|
| Items from Ganesan (1994) | d. does not have a good alternative to the provider. [C17]<br><br>e. needs the provider to accomplish our goals. [C18] |
| <u>Relationship type</u><br>the group or class of relationships that share common governance characteristics<br><br>First three items from Boyle et al. (1992); the others are new items using Webster (1992) and Mentzer et al. (2001) | 4. The business relationship my firm has with the provider could better be described as "cooperative" rather than an "arm's length." [C21]<br><br>5. The business relationship my firm has with the provider could better be described as an "integrated" rather than a "cooperative." [C22]<br><br>6. My firm and the provider coordinate some of our business functions as if we were one company. [C24]<br><br>7. My firm's relationship with the provider is more than just repeat transactions. [C25]<br><br>8. My firm's relationship with the provider could better be described as "strategic" than "transactional." [C26] |
| <u>Strategy congruence</u><br>the perception of the match between the strategies of the two parties<br><br>New items from qualitative study | 9. My firm and the provider have common goals. [C27]<br><br>10. There is a match between my firm's philosophies and those of the provider. [C28]<br><br>11. The provider has a business strategy that is very different from that of my firm. [C29]<br><br>12. My firm does not believe there is a match between our goals and those of the provider. [C30]<br><br>13. My firm's strategy is aligned with that of the provider. [C31] |
| <u>Capability congruence</u><br>the perception of a match between the capabilities and needs of the two parties<br><br>New items from qualitative study | 14. The provider has the capabilities that my firm needs. [C32]<br><br>15. My firm sometimes has trouble obtaining the resources we need from the provider. [C33]<br><br>16. The provider has the appropriate resources to accommodate my firm's needs. [C35]<br><br>17. The provider does not bring any unique capabilities to my firm. [C36] |

| | |
|---|---|
| Importance<br>the perception of the significance of one party by the other party in the relationship<br><br>New items from qualitative study | 18. My firm does a great deal of business with the provider. [C37]<br><br>19. The provider carries a relatively large percentage of my firm's freight. [C38]<br><br>20. My firm does not use the provider often. [C39]<br><br>21. My firm frequently uses the provider to ship our freight. [C40]<br><br>22. My firm uses the provider as little as possible. [C41] |
| Relationship value<br>the perception of benefits received versus costs sacrificed from the relationship<br><br>New items from qualitative study | 23. My firm receives a great deal of benefits from the relationship with the provider. [C42]<br><br>24. The costs to my firm for the relationship with the provider do not justify the benefits we receive. [C43]<br><br>25. My firm receives more benefits from the relationship with the provider than costs put into maintaining it. [C45]<br><br>26. My firm gets a lot of value from the relationship with the provider. [C46] |

Demographic Questions

27. Which one of the following best characterizes the type of relationship your firm has with the provider?
    - o Arm's length
    - o Cooperative
    - o Integrated

28. How long has this company been a trucking provider for your firm?
    - o Less than 6 months
    - o 7-12 months
    - o 1-3 years
    - o More than 3 years

29. How many years have you personally been dealing with the provider?
    - o Less than 6 months
    - o 7-12 months
    - o 1-3 years
    - o More than 3 years

30. What is the approximate percentage of your freight volume carried by the provider?
    - o Less than 10%
    - o 10-20%
    - o 21-40%
    - o 41-60%
    - o Greater than 60%

35. Please choose the product description that best describes what the provider carries for your firm.
    - o High value/differentiated product
    - o Low value/differentiated product
    - o Combination of several of these
    - o High value commodity
    - o Low value commodity

36. Approximately how many shipments does the provider carry for your firm each day?
    - o Less than 5
    - o 6-10
    - o 11-20
    - o 21-40
    - o Greater than 40

37. Approximately how many transportation providers does your firm use?
    - o Less than 5
    - o 6-20
    - o 21-50
    - o Greater than 50

38. How many employees at your firm manage relationships (or accounts) with transportation providers?
    - o 1
    - o 2-3
    - o 4-6
    - o Greater than 6

39. Which term best describes your firm's position in the supply chain?
    - o Retailer
    - o Wholesaler or distributor
    - o Manufacturer
    - o Supplier to a manufacturer

40. Which term best describes your firm's industry?
    - o Automotive
    - o Apparel/textiles
    - o Electronics
    - o Chemicals/plastics
    - o Medical/pharmaceutical
    - o Consumer packaged goods
    - o Industrial products
    - o Other

41. What is your firm's approximate annual sales revenue?
    - o Less than $1 million
    - o $1-50 million
    - o $51-500 million
    - o $501 million - $1 billion
    - o Greater than $1 billion

42. Please provide your job title.

_____

# APPENDIX E

# SCALE CONFIRMATION

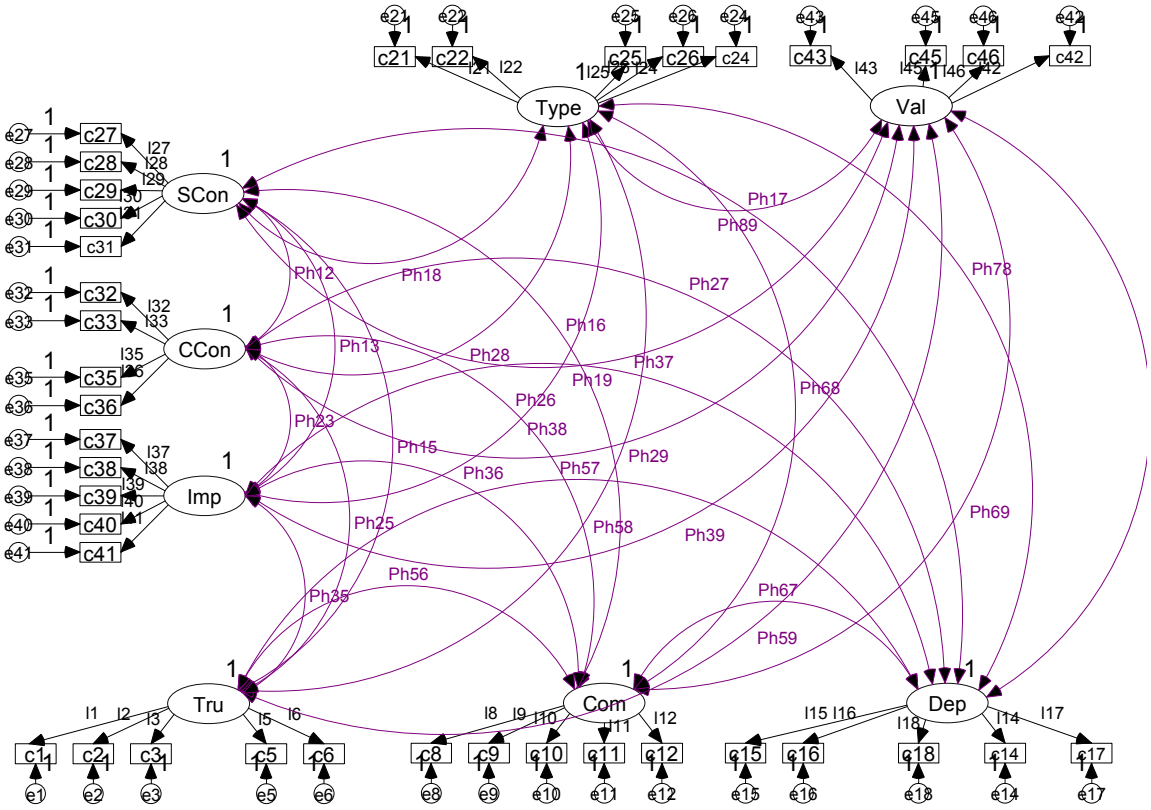
**TESTS OF NORMALITY**

| | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| C1 | .237 | 322 | .000 | .874 | 322 | .000 |
| C2 | .210 | 322 | .000 | .886 | 322 | .000 |
| C3 | .213 | 322 | .000 | .882 | 322 | .000 |
| C5 | .216 | 322 | .000 | .884 | 322 | .000 |
| C6 | .202 | 322 | .000 | .904 | 322 | .000 |
| C8 | .205 | 322 | .000 | .894 | 322 | .000 |
| C9 | .153 | 322 | .000 | .923 | 322 | .000 |
| C10 | .196 | 322 | .000 | .904 | 322 | .000 |
| C11 | .176 | 322 | .000 | .914 | 322 | .000 |
| C12 | .183 | 322 | .000 | .904 | 322 | .000 |
| C14 | .160 | 322 | .000 | .926 | 322 | .000 |
| C15 | .201 | 322 | .000 | .923 | 322 | .000 |
| C16 | .158 | 322 | .000 | .927 | 322 | .000 |
| C17 | .155 | 322 | .000 | .930 | 322 | .000 |
| C18 | .185 | 322 | .000 | .918 | 322 | .000 |
| C21 | .202 | 322 | .000 | .896 | 322 | .000 |
| C22 | .133 | 322 | .000 | .939 | 322 | .000 |
| C24 | .166 | 322 | .000 | .925 | 322 | .000 |
| C25 | .210 | 322 | .000 | .914 | 322 | .000 |
| C26 | .182 | 322 | .000 | .929 | 322 | .000 |
| C27 | .175 | 322 | .000 | .928 | 322 | .000 |
| C28 | .179 | 322 | .000 | .932 | 322 | .000 |
| C29 | .147 | 322 | .000 | .946 | 322 | .000 |
| C30 | .170 | 322 | .000 | .925 | 322 | .000 |
| C31 | .189 | 322 | .000 | .931 | 322 | .000 |
| C32 | .263 | 322 | .000 | .851 | 322 | .000 |
| C33 | .188 | 322 | .000 | .922 | 322 | .000 |
| C35 | .234 | 322 | .000 | .873 | 322 | .000 |
| C36 | .179 | 322 | .000 | .930 | 322 | .000 |
| C37 | .227 | 322 | .000 | .874 | 322 | .000 |
| C38 | .163 | 322 | .000 | .916 | 322 | .000 |
| C39 | .259 | 322 | .000 | .804 | 322 | .000 |
| C40 | .256 | 322 | .000 | .832 | 322 | .000 |
| C41 | .268 | 322 | .000 | .777 | 322 | .000 |
| C42 | .179 | 322 | .000 | .916 | 322 | .000 |
| C43 | .214 | 322 | .000 | .897 | 322 | .000 |
| C45 | .150 | 322 | .000 | .934 | 322 | .000 |
| C46 | .160 | 322 | .000 | .930 | 322 | .000 |

## DESCRIPTIVE STATISTICS

| | Mean | Std. Dev. | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|
| | Statistic | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| C1 | 5.10 | 1.631 | -.797 | .136 | -.390 | .271 |
| C2 | 4.97 | 1.657 | -.720 | .136 | -.502 | .271 |
| C3 | 4.94 | 1.696 | -.787 | .136 | -.362 | .271 |
| C5 | 5.01 | 1.637 | -.748 | .136 | -.429 | .271 |
| C6 | 4.36 | 1.875 | -.423 | .136 | -1.041 | .271 |
| C8 | 4.98 | 1.671 | -.704 | .136 | -.477 | .271 |
| C9 | 4.30 | 1.848 | -.304 | .136 | -1.033 | .271 |
| C10 | 4.62 | 1.777 | -.571 | .136 | -.741 | .271 |
| C11 | 3.40 | 1.850 | .284 | .136 | -1.091 | .271 |
| C12 | 4.49 | 1.900 | -.458 | .136 | -.981 | .271 |
| C14 | 4.56 | 1.764 | -.347 | .136 | -.922 | .271 |
| C15 | 4.32 | 1.652 | -.453 | .136 | -.730 | .271 |
| C16 | 3.99 | 1.809 | -.207 | .136 | -1.068 | .271 |
| C17 | 3.44 | 1.714 | .284 | .136 | -.934 | .271 |
| C18 | 4.31 | 1.816 | -.354 | .136 | -1.026 | .271 |
| C21 | 4.89 | 1.613 | -.735 | .136 | -.333 | .271 |
| C22 | 3.96 | 1.661 | -.111 | .136 | -.972 | .271 |
| C24 | 3.79 | 1.773 | -.055 | .136 | -1.188 | .271 |
| C25 | 4.71 | 1.621 | -.594 | .136 | -.470 | .271 |
| C26 | 4.32 | 1.761 | -.291 | .136 | -.958 | .271 |
| C27 | 4.46 | 1.608 | -.472 | .136 | -.585 | .271 |
| C28 | 4.29 | 1.673 | -.368 | .136 | -.724 | .271 |
| C29 | 3.63 | 1.575 | .255 | .136 | -.624 | .271 |
| C30 | 3.25 | 1.488 | .595 | .136 | -.084 | .271 |
| C31 | 3.91 | 1.473 | -.326 | .136 | -.670 | .271 |
| C32 | 5.43 | 1.231 | -1.157 | .136 | 1.316 | .271 |
| C33 | 4.16 | 1.743 | -.086 | .136 | -1.185 | .271 |
| C35 | 5.12 | 1.383 | -.908 | .136 | .207 | .271 |
| C36 | 3.60 | 1.664 | .321 | .136 | -.903 | .271 |
| C37 | 5.25 | 1.599 | -.840 | .136 | -.197 | .271 |
| C38 | 4.21 | 1.909 | -.137 | .136 | -1.261 | .271 |
| C39 | 2.42 | 1.639 | 1.226 | .136 | .625 | .271 |
| C40 | 5.35 | 1.678 | -1.109 | .136 | .317 | .271 |
| C41 | 2.40 | 1.761 | 1.251 | .136 | .497 | .271 |
| C42 | 4.48 | 1.667 | -.506 | .136 | -.706 | .271 |
| C43 | 3.02 | 1.664 | .710 | .136 | -.383 | .271 |
| C45 | 4.40 | 1.556 | -.378 | .136 | -.608 | .271 |
| C46 | 4.64 | 1.616 | -.467 | .136 | -.560 | .271 |

## UNCONSTRAINED MEASUREMENT MODEL



## UNIDIMENSIONALITY TESTS

| | Factor TRU | |
|---|---|---|
| C1 | .928 | One factor explains variance (85.9%). |
| C2 | .945 | |
| C3 | .908 | |
| C5 | .928 | |
| C6 | .927 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 16.744 | 5 | .005 |

| | Factor COM | |
|---|---|---|
| C8 | .886 | One factor explains variance (75.1%). [One factor explains a variance of 76.3% if C10 is removed.] |
| C9 | .876 | |
| C10 | .832 | |
| C11 | .818 | |
| C12 | .917 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 31.569 | 5 | .000 |

| | Factor DEP | |
|---|---|---|
| C14 | -.528 | One factor explains variance (47.5%). [One factor explains a variance of 60.0% if C14 and C17 are removed.] |
| C15 | .857 | |
| C16 | .774 | |
| C17 | .568 | |
| C18 | .662 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 58.007 | 5 | .000 |

| | Factor TYPE | |
|---|---|---|
| C21 | .633 | One factor explains variance (57.3%). [One factor explains a variance of 61.3% if C21 is removed.] |
| C22 | .678 | |
| C24 | .789 | |
| C25 | .831 | |
| C26 | .832 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 20.220 | 5 | .001 |

| | Factor SCON | |
|---|---|---|
| C27 | .808 | |
| C28 | .843 | One factors explains variance (57.5%). |
| C29 | -.618 | |
| C30 | -.713 | |
| C31 | .789 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 68.331 | 5 | .000 |

| | Factor CCON | |
|---|---|---|
| C32 | .834 | One factor explains variance (42.0%). |
| C33 | -.465 | |
| C35 | .741 | |
| C36 | -.470 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 21.883 | 2 | .000 |

| | Factor IMP | |
|---|---|---|
| C37 | .853 | |
| C38 | .704 | One factor explains variance (66.0%). |
| C39 | -.885 | |
| C40 | .777 | |
| C41 | -.831 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 81.780 | 5 | .000 |

| | Factor VAL | |
|---|---|---|
| C42 | .841 | One factor explains variance (65.3%). [One factor explains a variance of 65.1% if C42 is removed. |
| C43 | -.676 | |
| C45 | .706 | |
| C46 | .974 | |

Goodness-of-fit Test

| Chi-Square | df | Sig. |
|---|---|---|
| 21.908 | 2 | .000 |

## EXPLORATORY FACTOR ANALYSIS LOADINGS (SPSS)

| | TRU | COM | DEP | TYPE | SCON | CCON | IMP | VAL |
|---|---|---|---|---|---|---|---|---|
| C1 | 0.979 | | | | | | | |
| C2 | 1.055 | | | | | | | |
| C3 | 0.916 | | | | | | | |
| C5 | 0.907 | | | | | | | |
| C6 | 0.920 | | | | | | | |
| C8 | | 0.732 | | | | | | |
| C9 | | 0.793 | | | | | | |
| C10 | | 0.735 | | | | | | |
| C11 | | 0.908 | | | | | | |
| C12 | | 1.009 | | | | | | |
| C14* | | | -0.621 | | | | | |
| C15 | | | 0.683 | | | | | |
| C16 | | | 0.503 | | | | | |
| C17 | | | 0.823 | | | | | |
| C18 | | | 0.626 | | | | | |
| C21 | 0.390 | | | 0.229 | | | | |
| C22 | | | | 0.582 | | | | |
| C24 | | | | 0.842 | | | | |
| C25 | | | | 0.917 | | | | |
| C26 | | | | 0.771 | | | | |
| C27 | | | | 0.582 | 0.203 | | | |
| C28 | | | | 0.517 | 0.197 | | | |
| C29* | | | | | -0.791 | | | |
| C30* | | | | | -0.726 | | | |
| C31 | | | | 0.411 | 0.289 | | | |
| C32 | | | | | | 0.980 | | |
| C33* | | | | | | -0.067 | | -0.365 |
| C35 | | | | | | 0.672 | | |
| C36* | | | | | | -0.009 | | -0.362 |
| C37 | | | | | | | 0.772 | |
| C38 | | | | | | | 0.627 | |
| C39* | | | | | | | -0.936 | |
| C40 | | | | | | | 0.776 | |
| C41* | | | | | | | -0.818 | |
| C42 | | | | | | | | 0.468 |
| C43* | | | | | | | | -0.657 |
| C45 | | | | | | | | 0.777 |
| C46 | | | | | | | | 0.643 |

* Negatively phrased items.

## CONFIRMATORY FACTOR ANALYSIS LOADINGS (SEM)

| | TRU | COM | DEP | TYPE | SCON | CCON | IMP | VAL |
|---|---|---|---|---|---|---|---|---|
| C1 | 0.925 | | | | | | | |
| C2 | 0.941 | | | | | | | |
| C3 | 0.908 | | | | | | | |
| C5 | 0.931 | | | | | | | |
| C6 | 0.930 | | | | | | | |
| C8 | | 0.894 | | | | | | |
| C9 | | 0.878 | | | | | | |
| C10 | | 0.840 | | | | | | |
| C11 | | 0.812 | | | | | | |
| C12 | | 0.905 | | | | | | |
| C14* | | | -0.487 | | | | | |
| C15 | | | 0.832 | | | | | |
| C16 | | | 0.835 | | | | | |
| C17 | | | 0.498 | | | | | |
| C18 | | | 0.660 | | | | | |
| C21 | | | | 0.690 | | | | |
| C22 | | | | 0.667 | | | | |
| C24 | | | | 0.781 | | | | |
| C25 | | | | 0.824 | | | | |
| C26 | | | | 0.809 | | | | |
| C27 | | | | | 0.814 | | | |
| C28 | | | | | 0.870 | | | |
| C29* | | | | | -0.577 | | | |
| C30* | | | | | -0.698 | | | |
| C31 | | | | | 0.790 | | | |
| C32 | | | | | | 0.723 | | |
| C33* | | | | | | -0.580 | | |
| C35 | | | | | | 0.583 | | |
| C36* | | | | | | -0.645 | | |
| C37 | | | | | | | 0.877 | |
| C38 | | | | | | | 0.724 | |
| C39* | | | | | | | -0.866 | |
| C40 | | | | | | | 0.780 | |
| C41* | | | | | | | -0.824 | |
| C42 | | | | | | | | 0.872 |
| C43* | | | | | | | | -0.705 |
| C45 | | | | | | | | 0.686 |
| C46 | | | | | | | | 0.947 |

* Negatively phrased items.

## RELIABILITY TESTS

Trust Correlation Matrix

| | C1 | C2 | C3 | C5 | C6 |
|---|---|---|---|---|---|
| C1 | 1.0000 | | | | |
| C2 | .8873 | 1.0000 | | | |
| C3 | .8379 | .8576 | 1.0000 | | |
| C5 | .8467 | .8679 | .8604 | 1.0000 | |
| C6 | .8630 | .8738 | .8271 | .8709 | 1.0000 |

Alpha = .9674 Standardized item alpha = .9683

Commitment Correlation Matrix

| | C8 | C9 | C10 | C11 | C12 |
|---|---|---|---|---|---|
| C8 | 1.0000 | | | | |
| C9 | .8038 | 1.0000 | | | |
| C10 | .7161 | .7250 | 1.0000 | | |
| C11 | .6744 | .7252 | .7216 | 1.0000 | |
| C12 | .8255 | .7816 | .7634 | .7612 | 1.0000 |

Alpha = .9370 Standardized item alpha = .9374 [.927 without C10]

Dependence Correlation Matrix

| | C14 | C15 | C16 | C17 | C18 |
|---|---|---|---|---|---|
| C14 | 1.0000 | | | | |
| C15 | -.4413 | 1.0000 | | | |
| C16 | -.3116 | .7016 | 1.0000 | | |
| C17 | -.4811 | .4786 | .3415 | 1.0000 | |
| C18 | -.4125 | .5190 | .5398 | .4467 | 1.0000 |

Alpha = .4429 Standardized item alpha = .4447 [.809 without C14 and C17]

Type Correlation Matrix

| | C21 | C22 | C24 | C25 | C26 |
|---|---|---|---|---|---|
| C21 | 1.0000 | | | | |
| C22 | .4704 | 1.0000 | | | |
| C24 | .4590 | .5905 | 1.0000 | | |
| C25 | .5263 | .5041 | .6710 | 1.0000 | |
| C26 | .5380 | .5645 | .6307 | .7062 | 1.0000 |

Alpha = .8675 Standardized item alpha = .8671 [.861 without C21]

Strategy Congruence Correlation Matrix

| | C27 | C28 | C29 | C30 | C31 |
|---|---|---|---|---|---|
| C27 | 1.0000 | | | | |
| C28 | .7215 | 1.0000 | | | |
| C29 | -.4511 | -.4906 | 1.0000 | | |
| C30 | -.5161 | -.5614 | .6453 | 1.0000 | |
| C31 | .6456 | .6621 | -.4423 | -.5870 | 1.0000 |

Alpha = -.2170 Standardized item alpha = -.2611

Capability Congruence Correlation Matrix

| | C32 | C33 | C35 | C36 |
|---|---|---|---|---|
| C32 | 1.0000 | | | |
| C33 | -.3516 | 1.0000 | | |
| C35 | .6318 | -.3408 | 1.0000 | |
| C36 | -.3895 | .3939 | -.2880 | 1.0000 |

Alpha = -.2920 Standardized item alpha = -.2818

Importance Correlation Matrix

| | C37 | C38 | C39 | C40 | C41 |
|---|---|---|---|---|---|
| C37 | 1.0000 | | | | |
| C38 | .7354 | 1.0000 | | | |
| C39 | -.7265 | -.5688 | 1.0000 | | |
| C40 | .6837 | .5121 | -.6935 | 1.0000 | |
| C41 | -.6674 | -.5333 | .7922 | -.6292 | 1.0000 |

Alpha = -.9207 Standardized item alpha = -.9745

Value Correlation Matrix

| | C42 | C43 | C45 | C46 |
|---|---|---|---|---|
| C42 | 1.0000 | | | |
| C43 | -.5713 | 1.0000 | | |
| C45 | .5432 | -.5887 | 1.0000 | |
| C46 | .8227 | -.6494 | .6875 | 1.0000 |

Alpha = .1108 Standardized item alpha = .1450 [.920 without C42]

Magnitude Correlation Matrix

| | TRU | COM | DEP |
|---|---|---|---|
| TRU | 1.0000 | | |
| COM | .7303 | 1.0000 | |
| DEP | .3290 | .4438 | 1.0000 |

Alpha = .7557 Standardized item alpha = .7482 [.800 without C10, C14 and C17]

## RELIABILITY TESTS

| Item | Lambda (ABS) | Lambda squared | Meas Error | Construct Reliability > 0.70 | Variance Extracted > 0.50 | Construct Reliability (w/o *) | Variance Extracted (w/o *) |
|---|---|---|---|---|---|---|---|
| C1 | 0.925 | 0.856 | 0.144 | | | | |
| C2 | 0.941 | 0.885 | 0.115 | | | | |
| C3 | 0.908 | 0.824 | 0.176 | | | | |
| C5 | 0.931 | 0.867 | 0.133 | | | | |
| C6 | 0.93 | 0.865 | 0.135 | | | | |
| Trust | 4.635 | 4.297 | 0.703 | 0.968 | 0.859 | 0.968 | 0.859 |
| C8 | 0.894 | 0.799 | 0.201 | | | | |
| C9 | 0.878 | 0.771 | 0.229 | | | | |
| C10 | 0.84 | 0.706 | 0.294 | | | | |
| C11 | 0.812 | 0.659 | 0.341 | | | | |
| C12 | 0.905 | 0.819 | 0.181 | | | | |
| Commitment | 4.329 | 3.754 | 1.246 | 0.938 | 0.751 | 0.928 | 0.763 |
| C14 | 0.487 | 0.237 | 0.763 | | | | |
| C15 | 0.832 | 0.692 | 0.308 | | | | |
| C16 | 0.835 | 0.697 | 0.303 | | | | |
| C17 | 0.498 | 0.248 | 0.752 | | | | |
| C18 | 0.66 | 0.436 | 0.564 | | | | |
| Dependence | 3.312 | 2.310 | 2.690 | 0.803 | 0.462 | 0.812 | 0.597 |
| C21 | 0.69 | 0.476 | 0.524 | | | | |
| C22 | 0.667 | 0.445 | 0.555 | | | | |
| C24 | 0.781 | 0.610 | 0.390 | | | | |
| C25 | 0.824 | 0.679 | 0.321 | | | | |
| C26 | 0.809 | 0.654 | 0.346 | | | | |
| Type | 3.771 | 2.864 | 2.136 | 0.869 | 0.573 | 0.862 | 0.612 |
| C27 | 0.814 | 0.663 | 0.337 | | | | |
| C28 | 0.87 | 0.757 | 0.243 | | | | |
| C29 | 0.577 | 0.333 | 0.667 | | | | |
| C30 | 0.698 | 0.487 | 0.513 | | | | |
| C31 | 0.79 | 0.624 | 0.376 | | | | |
| Strategy Con | 3.749 | 2.864 | 2.136 | 0.868 | 0.573 | 0.865 | 0.566 |
| C32 | 0.723 | 0.523 | 0.477 | | | | |
| C33 | 0.58 | 0.336 | 0.664 | | | | |
| C35 | 0.583 | 0.340 | 0.660 | | | | |
| C36 | 0.645 | 0.416 | 0.584 | | | | |
| Capability Con | 2.531 | 1.615 | 2.385 | 0.729 | 0.404 | 0.732 | 0.408 |
| C37 | 0.877 | 0.769 | 0.231 | | | | |
| C38 | 0.724 | 0.524 | 0.476 | | | | |
| C39 | 0.866 | 0.750 | 0.250 | | | | |
| C40 | 0.78 | 0.608 | 0.392 | | | | |
| C41 | 0.824 | 0.679 | 0.321 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Importance | 4.071 | 3.331 | 1.669 | 0.908 | 0.666 | 0.908 | 0.666 |
| C42 | 0.872 | 0.760 | 0.240 | | | | |
| C43 | 0.705 | 0.497 | 0.503 | | | | |
| C45 | 0.686 | 0.471 | 0.529 | | | | |
| C46 | 0.947 | 0.897 | 0.103 | | | | |
| Value | 3.210 | 2.625 | 1.375 | 0.882 | 0.656 | 0.839 | 0.641 |
| Trust | 0.81 | 0.656 | 0.344 | | | | |
| Commitment | 0.68 | 0.462 | 0.538 | | | | |
| Dependence | 0.59 | 0.348 | 0.652 | | | | |
| Magnitude | 2.08 | 1.4666 | 1.5334 | 0.738 | 0.489 | 0.799 | 0.572 |

## CONVERGENT VALIDITY

| Item | Lambda | Significance |
|---|---|---|
| C1 | 0.925 | 0.000 |
| C2 | 0.941 | 0.000 |
| C3 | 0.908 | 0.000 |
| C5 | 0.931 | 0.000 |
| C6 | 0.93 | 0.000 |
| C8 | 0.894 | 0.000 |
| C9 | 0.878 | 0.000 |
| C10 | 0.84 | 0.000 |
| C11 | 0.812 | 0.000 |
| C12 | 0.905 | 0.000 |
| C14 | -0.487 | 0.000 |
| C15 | 0.832 | 0.000 |
| C16 | 0.835 | 0.000 |
| C17 | 0.498 | 0.000 |
| C18 | 0.66 | 0.000 |
| C21 | 0.69 | 0.000 |
| C22 | 0.667 | 0.000 |
| C24 | 0.781 | 0.000 |
| C25 | 0.824 | 0.000 |
| C26 | 0.809 | 0.000 |
| C27 | 0.814 | 0.000 |
| C28 | 0.87 | 0.000 |
| C29* | -0.577 | 0.000 |
| C30* | -0.698 | 0.000 |
| C31 | 0.79 | 0.000 |
| C32 | 0.723 | 0.000 |
| C33* | -0.58 | 0.000 |
| C35 | 0.583 | 0.000 |
| C36* | -0.645 | 0.000 |
| C37 | 0.877 | 0.000 |
| C38 | 0.724 | 0.000 |
| C39* | -0.866 | 0.000 |
| C40 | 0.78 | 0.000 |
| C41* | -0.824 | 0.000 |
| C42 | 0.872 | 0.000 |
| C43* | -0.705 | 0.000 |
| C45 | 0.686 | 0.000 |
| C46 | 0.947 | 0.000 |

* Negatively worded items.

## DISCRIMINANT VALIDITY INDICATORS

| Variables | Construct Pair | Correlation | Chi-square Difference | Chi-square Value (< 2E-6) |
|---|---|---|---|---|
| Exogenous | CCon-Imp | 0.632 | 137.308 | 1.0326E-31 |
| | SCon-Imp | 0.561 | 454.887 | 6.2313E-101 |
| | SCon-CCon | 0.728 | 84.299 | 4.2533E-20 |
| Magnitude Dimensions | Tru-Com | 0.762 | 482.477 | 6.1767E-107 |
| | Tru-Dep | 0.540 | 258.145 | 4.35379E-58 |
| | Com-Dep | 0.651 | 206.787 | 6.90044E-47 |
| Crossloading Concerns | Type-SCon | 0.873 | 70.327 | 5.02453E-17 |
| | CCon-Val | 0.868 | 27.913 | 1.26894E-07 |
| High Correlations | SCon-Val | 0.823 | 150.344 | 1.45804E-34 |
| | Tru-Val | 0.810 | 291.437 | 2.41796E-65 |
| | Tru-SCon | 0.806 | 246.522 | 1.48832E-55 |

Modification Indices

| Covariances: | | | M.I. | Par Change |
|---|---|---|---|---|
| e14 | <--> | CCon | 15.767 | -0.272 |
| e18 | <--> | e42 | 12.229 | 0.25 |
| e25 | <--> | Tru | 10.516 | -0.102 |
| e21 | <--> | Tru | 23.648 | 0.184 |
| e43 | <--> | e14 | 10.15 | 0.338 |
| e5 | <--> | Val | 11.413 | 0.063 |
| e33 | <--> | e14 | 10.256 | 0.414 |
| e36 | <--> | e14 | 20.385 | 0.531 |
| e39 | <--> | e14 | 12.012 | 0.283 |
| e41 | <--> | e43 | 20.692 | 0.334 |
| e30 | <--> | e41 | 17.168 | 0.278 |

| Regression Weights: | | | M.I. | Par Change |
|---|---|---|---|---|
| c17 | <-- | Type | 14.165 | -0.333 |
| c17 | <-- | Val | 10.283 | -0.279 |
| c17 | <-- | Imp | 10.188 | -0.281 |
| c17 | <-- | SCon | 12.488 | -0.311 |
| c42 | <-- | Dep | 12.381 | 0.188 |
| c16 | <-- | Type | 17.584 | 0.289 |
| c16 | <-- | Val | 12.619 | 0.24 |
| c16 | <-- | SCon | 19.943 | 0.306 |
| c21 | <-- | Tru | 18.071 | 0.292 |

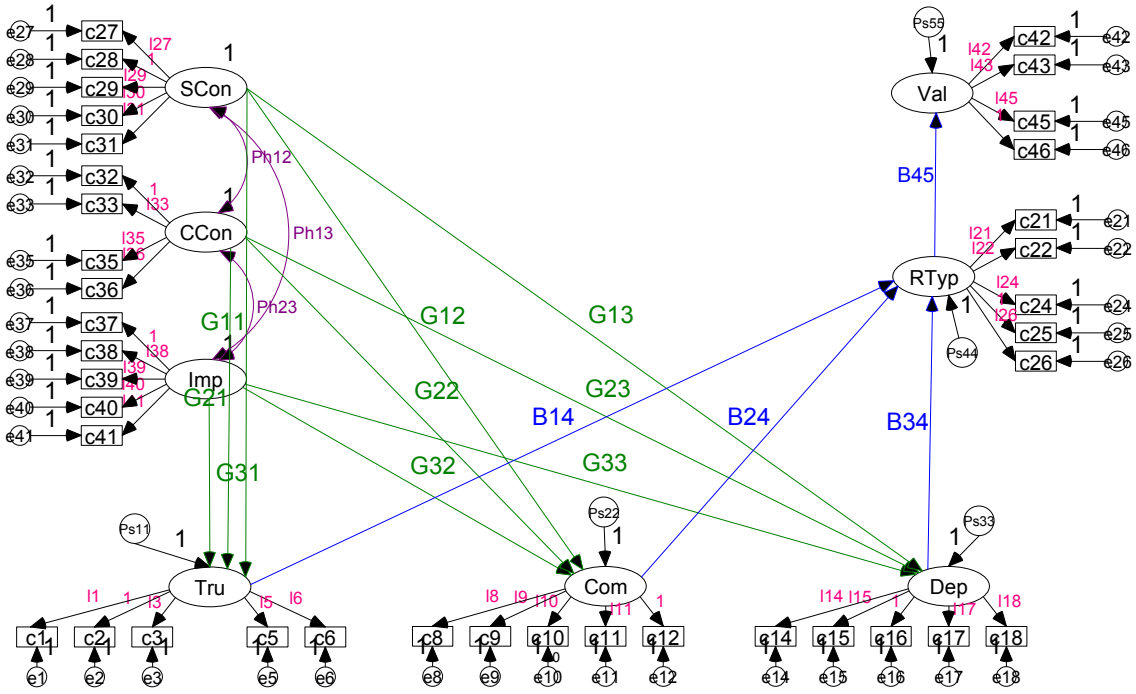
Squared Multiple Correlations

| | Estimate |
|---|---|
| c31 | 0.624 |
| c17 | 0.248 |
| c14 | 0.238 |
| c42 | 0.760 |
| c24 | 0.610 |
| c15 | 0.692 |
| c16 | 0.696 |
| c18 | 0.435 |
| c26 | 0.654 |
| c25 | 0.679 |
| c22 | 0.445 |
| c21 | 0.476 |
| c46 | 0.898 |
| c45 | 0.470 |
| c43 | 0.496 |
| c8 | 0.800 |
| c9 | 0.771 |
| c10 | 0.705 |
| c11 | 0.660 |
| c12 | 0.819 |
| c1 | 0.855 |
| c2 | 0.885 |
| c3 | 0.824 |
| c5 | 0.867 |
| c6 | 0.865 |
| c32 | 0.523 |
| c33 | 0.337 |
| c35 | 0.339 |
| c36 | 0.416 |
| c37 | 0.768 |
| c38 | 0.524 |
| c39 | 0.750 |
| c40 | 0.608 |
| c41 | 0.678 |
| c27 | 0.662 |
| c28 | 0.757 |
| c29 | 0.333 |
| c30 | 0.488 |

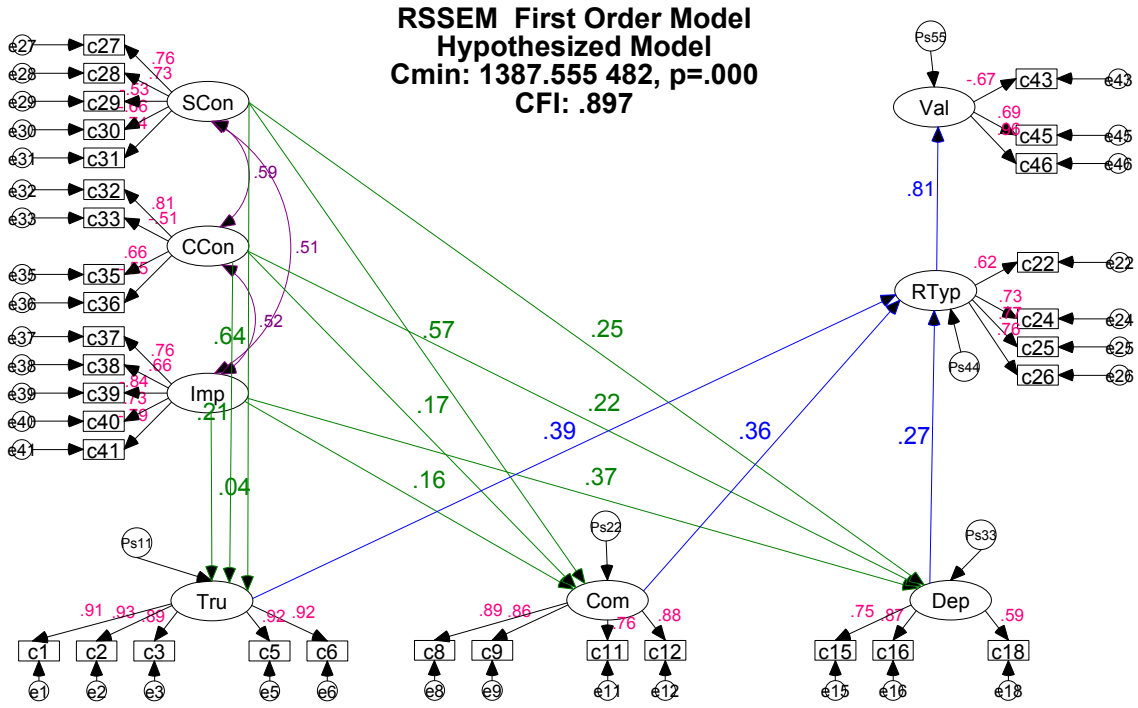
# APPENDIX F

# STRUCTURAL EQUATION MODELING RESULTS

**FIRST ORDER STRUCTURAL MODEL**



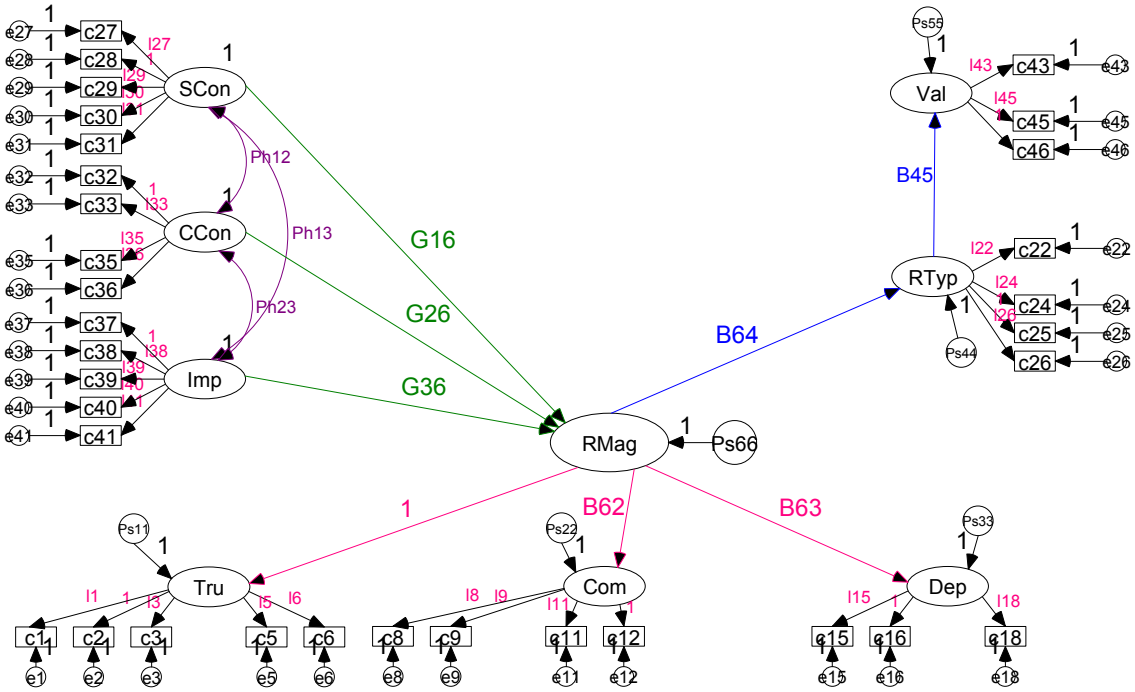
## FIRST ORDER MODEL RESULTS



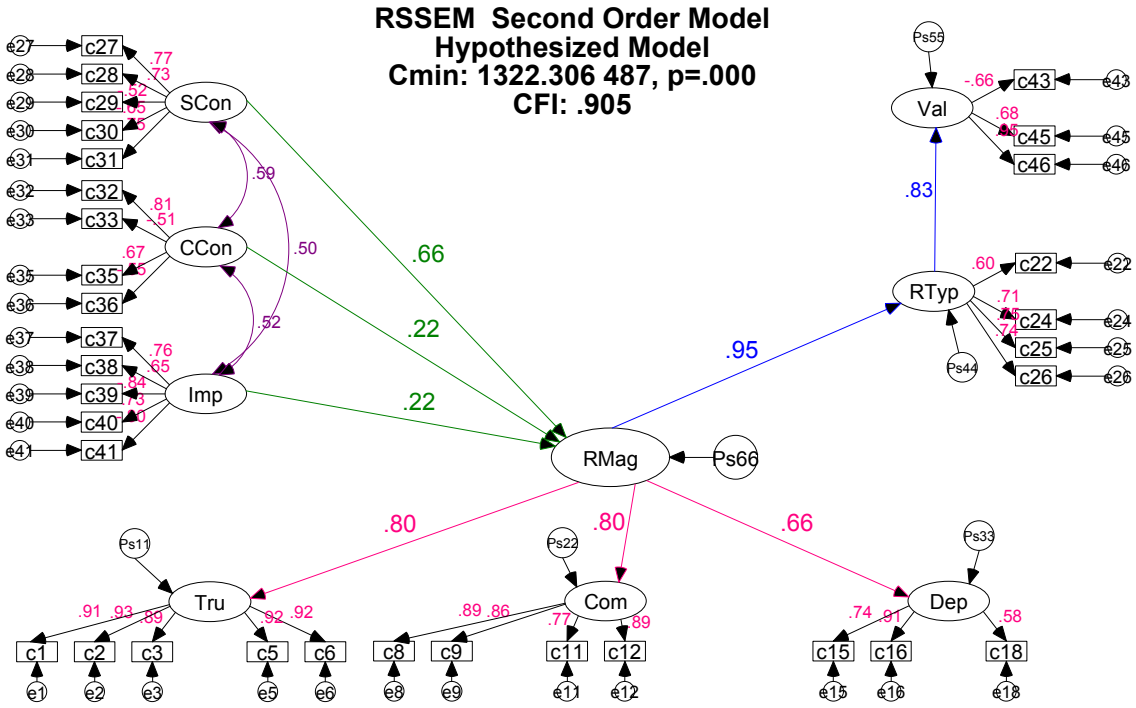

| Path | Estimate | Significance (<0.01)[1] |
|---|---|---|
| SCon-Tru (G11) | .64 | .000 |
| SCon-Com (G12) | .57 | .000 |
| SCon-Dep (G13) | .25 | .001 |
| CCon-Tru (G21) | .21 | .002 |
| CCon-Com (G22) | .17 | .016 |
| CCon-Dep (G23) | .22 | .008 |
| Imp-Tru (G31) | .04 | .410 |
| Imp-Com (G32) | .16 | .005 |
| Imp-Dep (G33) | .37 | .000 |
| Tru-Type (B14) | .39 | .000 |
| Com-Type (B24) | .36 | .000 |
| Dep-Type (B34) | .27 | .000 |
| Type-Val (B45) | .81 | .000 |

[1] Hair (1998)

## SECOND ORDER STRUCTURAL MODEL

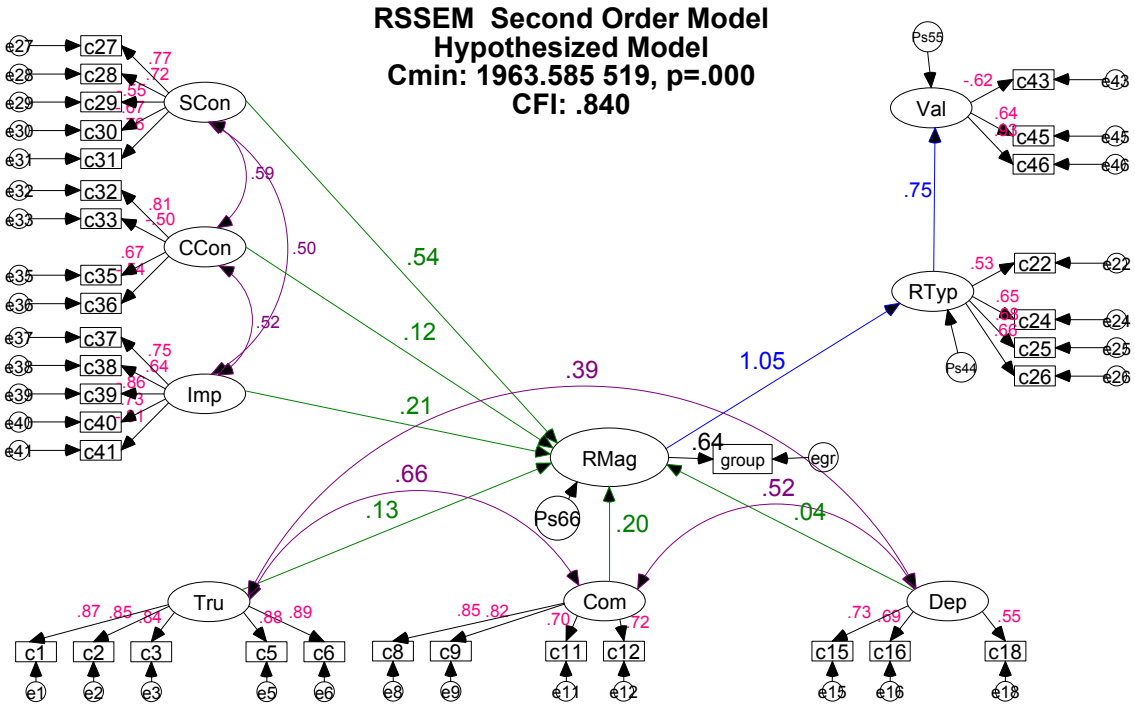


## THEORETICAL SECOND ORDER MODEL RESULTS




| Path | Estimate | Significance (<0.01) | Critical Ratio (>1.96) |
|---|---|---|---|
| SCon-RMag (G16) | .66 | .000 | 10.876 |
| CCon-RMag (G26) | .22 | .000 | 4.030 |
| Imp-RMag (G36) | .22 | .000 | 4.741 |
| RMag-Tru (B61) | .80 | .000 | n/a |
| RMag-Com (B62) | .80 | .000 | 13.372 |
| RMag-Dep (B63) | .66 | .000 | 10.801 |
| RMag-Type (B64) | .95 | .000 | 13.169 |
| Type-Val (B45) | .83 | .000 | 14.280 |

## RELATIONSHIP MAGNITUDE ALTERNATIVE MODEL RESULTS




| Path | Estimate | Significance (<0.01) |
|---|---|---|
| SCon-RMag (G16) | .52 | .000 |
| CCon-RMag (G26) | .12 | .085 |
| Imp-RMag (G36) | .21 | .000 |
| Tru-RMag (GT6) | .13 | .036 |
| Com-RMag (GC6) | .20 | .005 |
| Dep-RMag (GD6) | .04 | .475 |
| RMag-Type (B64) | 1.05 | .000 |
| Type-Val (B45) | .75 | .000 |

**VITA**

Susan L. Golicic holds a Bachelor of Science in Chemical Engineering from Wayne State University in Detroit, Michigan and a Master in Business Administration with concentrations in Logistics and Operations Management from the University of Tennessee in Knoxville, Tennessee. She has managed projects as a Radiological and Environmental Engineer for the Knolls Atomic Power Laboratory in Schenectady, New York and the Scientific Ecology Group in Oak Ridge, Tennessee. Susan also managed inbound materials logistics at one manufacturing and two assembly plants for DaimlerChrysler.

Susan's research and teaching interests include supply chain management, interorganization relationships, forecasting, and qualitative research methods. Susan has been actively involved an assistant director of the Sales Forecasting Management and the Supply Chain Strategy Forums at the University of Tennessee. She has presented at Council of Logistics Management, American Marketing Association, Academy of Marketing Science, and International Institute of Forecasting conferences and has published in Journal of Business Logistics, International Journal of Physical Distribution and Logistics Management, Supply Chain Management Review, Business Horizons and the Journal of Business Forecasting.

In May of 2003, Susan completed the requirements for the Ph.D. in Business Administration with a major in Logistics and Transportation and minor in Marketing at the University of Tennessee. She is presently employed as an Assistant Professor of Marketing at the University of Oregon in Eugene, Oregon.