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# Supply Chain Leadership

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To the Graduate Council:

I am submitting herewith a dissertation written by Charles Clifford Defee entitled "Supply Chain Leadership." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Business Administration.

Theodore P. Stank, Major Professor

We have read this dissertation and recommend its acceptance:

John T. Mentzer, Terry L. Esper, Kenneth J. Levine

Accepted for the Council:

Dixie L. Thompson

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Terry L. Esper

Kenneth J. Levine

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the  
Graduate School

(Original signatures are on file with official student records.)

# **SUPPLY CHAIN LEADERSHIP**

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

**Charles Clifford Defee  
August 2007**

## **DEDICATION**

This dissertation is dedicated to the memory of my wife, Celia Sue Defee

Whose unconditional love and support made this journey possible,  
and whose courage I admire beyond all others.

And to my children, Scott and Casey

You inspire me daily.

## ACKNOWLEDGEMENTS

The faculty and staff of the Department of Marketing and Logistics have my sincere gratitude. The support and encouragement I have received here goes well beyond the norm. Thank you for “teaching an old dog new tricks”. I am especially fortunate to have made so many good friends among my colleagues in the doctoral program. To each of the above, I say thank you and hope you know you will always be a part of my family. I owe a special thanks to my Dissertation Committee, Dr. Theodore P. Stank, Dr. John T. Mentzer, Dr. Terry L. Esper, and Dr. Kenneth J. Levine. I am particularly grateful to my Dissertation Committee Chairperson, Dr. Theodore P. Stank, for his insight, calming influence, and friendship throughout this process.

I have been privileged to call Mr. Mark Layton, CEO of PFSweb, my friend for many years. Without Mark’s ongoing support on so many levels this life-changing experience would not have been possible. In addition, I thank PFSweb and the University of Tennessee Integrated Value Chain Forums, both of whom provided financial support for this dissertation.

Of course, my passage through the doctoral program was never a solo trip, and has been fueled constantly by the love and support of my family. Some have made it to this point of the journey in mind and body, others in spirit, but each of you lives daily in my heart. I am truly fortunate that the two people I most admire are my father, William J., and my brother, Bill. Thank you for setting the standard so high.

## **ABSTRACT**

The complexity found in supply chains draws on the combined capabilities of multiple firms. Success in this environment requires the coordinated efforts of both a supply chain leader organization, and one or more supply chain follower organizations. Supply chain leadership has traditionally been ascribed to the most powerful, dominant organization in the supply chain. The theory of supply chain leadership presented in this dissertation redefines leadership in the supply chain context as a relationship between leader and followers described by the behaviors exhibited through each organization's actions. The theoretical model was developed from literature in the leadership, logistics, and strategic management disciplines. The nomological network is derived from five constructs: supply chain leadership, supply chain followership, information availability, communications, and rewards. Empirical testing was facilitated by data collected through an interactive simulation.

Findings were evaluated across two distinct environments: transactional networks and transformational networks. The results suggest supply chain leadership and followership both have a significant effect in transactional networks. Interestingly, supply chain followership was discovered to make a greater contribution to overall supply chain structural development and performance than supply chain leadership in transformational environments. The structural model demonstrated good fit and all six hypotheses were at least partially supported.

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## CHAPTER 1 – INTRODUCTION

The emergence of supply chains has shifted the locus of competition from firm against firm to supply chain against supply chain (Christopher 1992). A supply chain is defined as “a set of three or more companies directly linked by one or more of the upstream and downstream flows of products, services, finances, and information from a source to a customer” (Mentzer 2001, p. 5). Supply chains are inherently complex (Christopher and Towill 2002) and require the cooperation and coordination of multiple organizations working in concert to satisfy the tandem goals of efficiently and effectively fulfilling customer needs (Mentzer 2001). Many techniques have been suggested for achieving supply chain goals including collaboration (Sinkovics and Roath 2004; Stank, Keller, and Daugherty 2001), process integration (Min and Mentzer 2004; Rodrigues, Stank, and Lynch 2004), information sharing (Bowersox, Closs, and Stank 1999; Sanders and Premus 2005), standardization (Bowersox, Closs, and Stank 1999; Defee and Stank 2005) and aligning measures and rewards (Mentzer 2004).

The implementation and acceptance of these techniques across multiple supply chain members requires leadership. A supply chain leader often emerges to become the driving force behind strategic supply chain decisions. It has been suggested a firm must take the position of leadership to avoid chaos among the member organizations (Lambert, Stock, and Ellram 1998). Nevertheless, the role played by the supply chain leader has been largely overlooked in the logistics discipline.

Supply chain leadership (SCL) is a term frequently found in the literature. Unfortunately, the term suffers from inconsistent use and lack of a precise definition. SCL has been used to identify the most powerful organization in the supply chain

(Maloni and Benton 2000), a firm that outperforms others in an industry (Harrison and New 2002; Sankaran and Luxton 2003), and thought leaders in the supply chain discipline (Williams 2004). Descriptions of leadership are based on the ability to influence others, often from a base of power (Yukl 2001), suggesting the association of SCL with powerful organizations is the most applicable description for this investigation. The power-centered view limits the scope of SCL by ignoring other potential antecedents. Therefore, a new definition is developed in this dissertation:

*SCL is a relational concept between a supply chain leader and one or more supply chain follower organizations. SCL is characterized by the ability of one organization in a supply chain to exert influence over other member organizations in order to increase supply chain follower compliance with and commitment to the leader's vision for the entire supply chain.*

Examples of SCL help to describe its existence and reinforce the definition. Wal-Mart establishes the rules member organizations must follow in many of the thousands of supply chains that feed its stores. A demonstration of SCL is seen in the company's willingness to share point-of-sale data with members, significantly influencing processes instituted across Wal-Mart supply chains (Gruman 2005). The company also indirectly influences supply chain processes in other industries through its continuous search for new and better technology solutions such as its recent emphasis on the adoption of RFID technology (Kinsella 2003; Moore 2005). Dell provides another example of SCL. The supply chain practices masterminded by the company have become a model for other supply chains in terms of inventory management and agility (Archer 2003).

Wal-Mart and Dell are easily identified as supply chain leaders of their own extended businesses operations, in part because of their size and relative economic power compared to the other organizations comprising their supply chains. The foresight and

supply chain expertise demonstrated by these exemplar companies may also contribute to their leadership positions. Supply chain leaders may also emerge because of customer patronage, the existence of a comprehensive trade franchise, or inter-organizational relationship development (Bowersox and Closs 1996).

The existence of supply chain leaders seems undeniable, but supply chain performance requires the cooperation of multiple member organizations and the coordination of complex processes across all members (Mentzer 2004; Stank, Crum, and Arango 1999; Stank, Keller, and Daugherty 2001). A supply chain leader may provide the incentive that encourages supply chain member firms to work more collaboratively than is found under traditional arms-length relationships. However, unless supply chain member organizations willingly choose to *follow the leader*, conflict may arise and supply chain performance may suffer as a result (Brown and Day 1981; Etgar 1979; Gaski 1984). It has generally been assumed that supply chain follower organizations -- i.e., those supply chain members not in a position of supply chain leadership -- lack the ability to influence supply chain strategies, and must simply accommodate the leader's wishes because of their relative lack of power (Maloni and Benton 2000). However, the success of any supply chain leader's strategy depends on its acceptance by those performing the lion's share of the work -- the supply chain follower organizations.

So, both SCL and supply chain followership (SCF) are critical to the success of a supply chain. The existence of one without the other is analogous to trying to wash one dirty hand while the other resides in a pocket. The process (wet hand, apply soap, scrub, rinse, and dry) and definition of a successful result (removal of dirt, hand dried and ready for next task) is understood, but accomplishing the task is impossible without the willing

participation of both hands. Similarly, the existence of a supply chain leader organization without follower organizations to accept responsibility for critical task completion destines the supply chain to failure. Supply chains lacking a leader organization can anticipate a similar fate. Since there appears to be a need for SCL and SCF it is unfortunate neither concept has received much attention from researchers. SCL is a somewhat overlooked concept and SCF is neither described nor defined in the literature. Since our understanding of SCL is limited, a greater understanding of the phenomenon holds the potential for new theory development and insights leading to improved supply chain performance and a strengthened, more sustainable competitive advantage.

The importance of achieving a deeper understanding of these concepts is found in three areas. First, the definitions of SCL and SCF are inadequate (in the case of SCL) or do not exist (in the case of SCF). Precise definitions allow the domain of the concept to be properly described, and provide a foundation for building a workable theory of SCL. A major reason for this investigation is to clarify the definition of SCL. Likewise, a definition of SCF is required to provide a complement to SCL, and more accurately describe the domain of the theory of SCL.

Second, identifying and classifying the styles used by supply chain leader and follower organizations will provide a means of understanding a key driving factor underlying the inter-organizational dynamics found in supply chains. Managers display different leadership and followership behaviors or styles. Leaders have been categorized as charismatic (House 1977), transformational (Bass 1985a; Burns 1978), authoritarian (House 1965; Jennings 1959), authentic (Avolio et al. 2004; Masarech 2001; May et al. 2003), and passive (Bass 1985a) among others. Just as managers exhibit different styles,



supply chain organizations project differing leadership and followership styles, and through these styles develop differing types of relationships with other members.

Third, the existence of certain SCL and SCF styles may contribute to consistently better or worse performance. Performance is considered a consequence of the structure developed throughout a supply chain as a result of strategic decisions (Defee and Stank 2005). Leader and follower styles may be seen as a manifestation of supply chain strategy that influences performance. Linking leader and follower styles to performance may highlight differences attributable to certain SCL and SCF style combinations.

The remainder of this chapter elaborates on the theoretical justification and purpose of this research. Transformational leadership (Bass 1985a; Burns 1978) and strategy-structure-performance theory (Chandler 1962; Rumelt 1974) are proposed as existing theories critical to the development of a theory of SCL. Gaps in existing supply chain theory are highlighted to further support the need for a more complete understanding of SCL and SCF. Objectives of the research are discussed, research questions that will guide the investigation are developed from the gaps, and potential contributions are summarized. The chapter concludes with an outline of the remaining chapters contained in the dissertation.

## **THEORETICAL JUSTIFICATION**

The phenomenon of SCL has not received significant empirical investigation in the logistics or other supply chain related disciplines. As the core concept of interest, SCL is proposed as a macro, inter-organizational level concept elevated from micro, managerial level concepts found in the leadership literature. This section builds the foundation needed for development of the SCL concept.

## **Transformational Leadership**

Leadership has been a field of intense interest to academics and managers throughout the past century (Bass 1990; Stogdill 1974) with many theories of leadership proposed. The earliest theories tend to be leader-centric in their scope and emphasize the special qualities, traits or behaviors that distinguish leaders from non-leaders (Hunt 1999). More recent theories have taken an increasingly holistic, relationship-oriented view of the phenomenon (House and Aditya 1997). These theories credit followers as possessing the wherewithal to assume greater responsibilities and influence leader plans (Kouzes and Posner 1987; 2004).

As recently as the 1970s, leaders were perceived as pursuing a series of cost-benefit exchanges, or transactions, intended to meet subordinates' immediate economic and psychological needs in return for task performance (Bass 1985a). Transactional leadership occurs when "leaders use sanctions and rewards to induce followers to perform defined tasks and exhibit loyalty and commitment to the organization" (Grundstien-Amado 1999, p. 250). This view is consistent with social exchange theory (Hollander 1958; 1978), and is based on the assumption that leaders strive to control follower behavior by simultaneously imposing their authority and satisfying follower needs. Follower behavior is influenced by reinforcing desired behaviors that support the organization's goals, and punishing undesirable behaviors (Pearce et al. 2003).

Transactional leaders focus on clearly defining the requirements of a task and establishing supervisory controls needed to ensure followers deliver at the desired level of performance (Burns 1978), but make no effort to change followers' values (Grundstien-Amado 1999). Contingent reinforcement -- the use of rewards and/or

punishments to ensure performance -- is the primary motivational tool, and is often combined with management-by-exception as a supporting behavior used by transactional managers to obtain compliance (Bass 1985a).

Transformational leadership has become the dominant paradigm of leadership research (Bass 1999). The theory expands the role of the leader beyond the exchange dynamic and is posited as the reason followers willingly expend extra effort to achieve organizational goals (Podsakoff et al. 1990). Transformational leadership was initially described by Burns (1978), and refined and tested by Bass (1985a). The transformational leader strives to raise the consciousness of followers (Yukl 2001), and is distinguished from the transactional leader through the behaviors used to influence followers.

“Transformational leadership involves fundamentally changing the values, goals, and aspirations of followers so that they perform their work because it is consistent with their values, as opposed to the expectation that they will be rewarded for their efforts” (MacKenzie, Podsakoff, and Rich 2001, p. 116). Commonly described leader behaviors include articulating a vision (Podsakoff et al. 1990), expressing high performance expectations (Podsakoff, MacKenzie, and Bommer 1996), providing intellectual stimulation (Bass 1985a), and displaying consideration for follower-specific needs (Bass 1985a; Hater and Bass 1988). Performance expectations may be less specific than in transactional leadership because the organization itself may be undergoing significant change as a result of a new vision presented by the leader. The desired outcome is higher performance by followers motivated to transcend their own self-interests and achieve the larger goals of the organization (Bass 1999; Burns 1978).

Research has shown transformational leadership increases follower satisfaction (Bass, Avolio, and Atwater 1996), motivation (Masi and Cooke 2000), extra role performance (MacKenzie, Podsakoff, and Rich 2001; Podsakoff et al. 1990), quality of output for the organization (Hoyt and Blascovich 2003; Jung and Avolio 2000), and bottom-line financial results (Perry and Proctor 2000). The findings associated with transactional leadership have not been as strong (Bryman 1992). “[Transactional] leader behaviors have not accounted for as much of the variance in performance and other criterion variables as originally expected” (MacKenzie, Podsakoff, and Rich 2001, p. 116). Transactional behaviors are associated with greater stress (Bass 1999), increased quantity of output (Hoyt and Blascovich 2003), and enhanced follower expectations (Keller and Szilagyi 1976).

All leaders are transactional to some extent, and certain tasks lend themselves to use of a transactional style rather than a transformational style (Bass 1985b; 1999; Hater and Bass 1988; House and Aditya 1997; Howell and Avolio 1993; Hoyt and Blascovich 2003; Vandenberghe 1999). Research findings suggest leaders demonstrating more transformational behaviors are more effective than their transactional counterparts (Bass et al. 1987). This result is termed the augmentation effect of transformational leadership (Bass and Avolio 1993; Waldman, Bass, and Yammarino 1990).

### *Supply Chain Leadership*

In a supply chain context transformational SCL is proposed to occur in organizations intent on establishing long-term relationships with member organizations and achieving holistic goals that benefit all members. Transformational supply chain leaders are expected to reinforce these relationships by creating supply chain structures

that make information available, encourage informal communications, decentralize decision-making activities, and promote the use of holistic rewards. Transactional SCL is proposed to be found in organizations preferring short-term, arms-length relationships with member organizations and focused primarily on the achievement of their own firm-centered goals. Transactional supply chain leaders are expected to create supply chain structures that limit information sharing, promote formal communications, centralize decision-making authority, and use firm-specific rewards. The rationale for these classifications is developed in detail in Chapter 2.

### **Strategy - Structure - Performance Theory**

Organizations use strategy to differentiate their offerings in the marketplace and create a competitive advantage (Porter 1985; 1980). Strategy is “a pattern or stream of major and minor decisions about an organization’s possible future domains” (Miles and Snow 1978, p. 7), and represents the roadmap the firm follows in the quest for competitive advantage. Competition is dynamic and any competitive advantage gained as a result of a successful strategy is only temporary (Day and Reibstein 1997) requiring that strategies be updated over time to remain effective (Hunt and Morgan 1995).

Strategy alone does not guarantee a successful result. Firms must develop mechanisms for realizing strategic plans, and this is accomplished through the creation of structure. Structure is “the design of the organization through which the enterprise is administered” (Chandler 1962, p 14). Structure may be manifested in many ways including formal organizational form represented by the degree of specialization, centralization, and formalization found throughout the organization, formal lines of authority, communication and information flows between departments and individuals,

the allocation of work into roles, techniques of coordination, methods of reward and punishment, and organizational policies (Chandler 1962; Child 1972; Dalton et al. 1980; Galbraith and Nathanson 1978; Miles and Snow 1978; Rumelt 1974). The alignment, or fit, between strategy and structure is a prerequisite for organizational success (Galbraith and Nathanson 1978; Miles and Snow 1978). Some minimal level of fit has been suggested as a baseline requirement for organizational survival (Miles and Snow 1984).

Chandler (1962) was the first to describe how companies develop specific organization structures as a result of the strategies they pursue. Rumelt (1974) augmented this view by linking performance outcomes to these strategy-structure combinations. Strategy and structure combinations that work well together, or “fit”, have consistently been found to outperform poorer fitting combinations (Miles and Snow 1984; 1978). Performance may be influenced by factors outside the firm’s control including market concentration, market growth, competitive intensity, changing customer requirements, governmental intervention in the form of public policy, health of the economy, and foreign market differences (Christensen and Montgomery 1981; Dalton et al. 1980; Galbraith and Kazanjian 1986; Khandwalla 1972; Miller 1988; 1987a; 1987b; Porter 1985; 1980). Internal factors other than strategy and structure may also influence performance outcomes. Acknowledgement of the effect of external and other internal forces on performance outcomes has further expanded SSP and led to the creation of structural contingency theory (Galunic and Eisenhardt 1994).

### *Structure and Performance in Supply Chains*

The unit of analysis of SSP theory has been extended beyond the individual firm to include the multi-firm environment of modern supply chains (Bowersox, Closs, and

Stank 1999). As firm boundaries blur because of closer supply chain relationships, structural elements are required that encompass all organizations in a supply chain (Chow, Henrikssen, and Heaver 1995). As with traditional SSP, the best structural outcome to support a supply chain strategy may be contingent on the influence of environmental variables outside the control of the supply chain leader such as changing customer requirements, competitive intensity, and the impact of government regulations. In a supply chain context, structural elements have been described as a means of ensuring tighter integration between supply chain members (Lambert, Cooper, and Pagh 1998). Poor integration may result in the failure of supply chain member working relationships and lead to reduced performance (Bowersox, Closs, and Stank 1999; Chow, Henrikssen, and Heaver 1995; Mollenkopf, Gibson, and Ozanne 2000).

The existence of aligned supply chain strategies and structural elements has been linked to improved performance in supply chains (Rodrigues, Stank, and Lynch 2004; Stank and Traichal 1998). Supply chain performance is a complex concept that spans financial, operational, and customer service criteria (Brewer and Speh 2000). Excellent performance cannot be determined on a single dimension such as low cost because other dimensions, such as customer service, may be adversely affected by attempts to optimize a single dimension. If customers are lost as a result, then high performance on a single dimension may cause irreparable damage to the supply chain's reputation and limit future growth opportunities.

Another concern surrounding supply chain performance measurement is that most research has attempted to measure performance for a single firm. Optimizing a single firm's performance may result in harming the performance of other supply chain

members. Holistic performance measures are necessary to ensure fairness in supply chain performance measurement and encourage member firms to actively participate in programs aimed at enhancing supply chain results (Holmberg 2000). Brewer and Speh (2000) suggest the balanced scorecard as an approach to performance measurement that may overcome the problem of multi-dimensional complexity. Economic value added (EVA) throughout the supply chain is another method that measures end-to-end performance of the supply chain and between-member dyadic performance (Lambert and Pohlen 2001). No consensus exists on a universally accepted supply chain performance measurement technique.

### **Gaps in Existing Knowledge**

The first journal articles describing “supply chains” appeared about 20 years ago (Bowersox, Carter, and Monczka 1985; Jones and Riley 1985). Since that time research in the discipline has evolved from primarily descriptive of supply chain processes and inter-organizational linkages (for example see Cooper, Lambert, and Pagh 1997; Croxton, Garcia-Dastugue, and Lambert 2001) to a more strategic view of supply chain management (SCM) as a way to achieve competitive advantage (Bowersox, Closs, and Cooper 2002; Bowersox, Closs, and Stank 1999; Christopher 1992; 2005; Lambert, Cooper, and Pagh 1998; Mentzer 2004; 2001). The rush to establish the strategic importance of SCM may have caused researchers to skip a step. Design and implementation of the cross-organizational, collaborative programs that define SCM requires a driving force. An organization must step to the front and assume leadership of SCM initiatives. Thus, SCL is a necessary antecedent of SCM, although no theory has been proposed to explain and predict SCL phenomena. This section describes five



knowledge gaps associated with SCL which will be used to develop the research questions that guide this dissertation.

### *SCL is a Misunderstood Concept*

SCL has frequently been a label applied to firms *after* assuming a leadership role, typically as a result of their differential power to influence the actions of other organizations in the supply chain. Other uses of SCL, such as a firm that is a top performer (Harrison and New 2002), a source of best practices (Anon 2005) or a thought leader (Fawcett and Magnan 2004) place the term in a very different context. This study proposes SCL occurs within the multi-organization context of a supply chain and is associated with the organization capable of exerting the greatest influence over other supply chain member organizations. As no definition consistent with this view of SCL exists in the literature, a need exists to distinguish supply chain leader organizations that take a leadership role in supply chains from other uses of the term. This is gap 1.

### *Establishing the Critical Role of SCF Organizations*

Followership is a largely overlooked concept (Chaleff 1995; Kelley 1992) that is essentially unheard of in the logistics and supply chain related disciplines. The omission of followership from the supply chain literature appears to be a significant oversight considering the importance of collaboration to the success of SCM (Mentzer 2004; Skjoett-Larson, Thernoe, and Andresen 2003; Stank, Keller, and Daugherty 2001). While collaborative efforts bring organizations together around a mutually held goal, the burden of initiating collaboration between organizations requires leadership. Arguably the supply chain leader is the driving force behind these initiatives in most cases.

Leadership is not a stand-alone concept, and it cannot be conceived without including the balancing concept of followership (Hollander 1993). Since most organizations in supply chains do not assume a leadership role, follower organizations must exist. Knowledge of supply chain followers, like supply chain leaders, is anecdotal. The unwritten assumption made in the logistics literature is follower organizations simply do as they are instructed by the leader organization. They are viewed similarly to followers in theories of leadership in which leaders hold all the power and followers have no choices available other than to do as the leader insists. Current theories of leadership have evolved into a relationship concept in which both leader and follower exert influence on the other (Grundstien-Amado 1999; Kouzes and Posner 1987; 2004).

This empowered view of followers is more appropriate for understanding supply chain inter-organizational relations. A supply chain follower organization will not pursue the direction of the supply chain leader without regard for its own interests -- i.e., a follower firm will not continue in a supply chain relationship that forces it to lose money or damage its reputation with customers simply because the leader desires a course of action that is contrary to the best interests of the follower. Unfortunately, the phenomenon of SCF has not been studied, and as with SCL, no definition of SCF has been proposed despite the important role played by supply chain follower organizations. Therefore, a definition of SCF is needed as a starting point. This is gap 2.

#### *The Need to Confirm SSP in the Supply Chain Context*

SSP theory has been suggested as an important strategic theory that is directly applicable to the supply chain environment (Bowersox, Closs, and Stank 1999; Chow, Henrikssen, and Heaver 1995; Defee and Stank 2005; Rodrigues, Stank, and Lynch 2004;

Stank, Davis, and Fugate 2005; Stock, Greis, and Kasarda 1999). Application of the theory in an inter-organizational context has been largely conceptual to this point. Only one empirical study uses an SSP framework to perform a limited test of an antecedent supply chain strategy (a relational strategy), linked to supply chain structure (integrated operations), with the measurement of performance consequences (Rodrigues, Stank, and Lynch 2004). The authors successfully establish the relevance of SSP in supply chains, but limit structural outcomes to a single broad integration construct and only measure performance from a firm-specific perspective. Continued empirical exploration is needed to confirm and extend SSP theory in a supply chain context.

Defee and Stank (2005) provide a conceptual outline of five supply chain structural outcomes including technology integration, communications, standards, decision making authority and rewards. Each of these structural outcomes represents a dimension of supply chain integration. Empirical testing of one or more of these structural dimensions provides a deeper level of understanding that may be viewed as closer to the tactical decision making required of supply chain managers. The need to expand on previous testing of supply chain structural elements represents gap 3.

Supply chain performance measurement is a problematic issue because of the difficulty of getting quantifiable performance results from multiple member organizations (Brewer and Speh 2000). Internal measures of operational performance have been used frequently in past research (Lambert and Pohlen 2001). True supply chain performance cannot be gauged unless a more holistic set of measures is used (Holmberg 2000). Hence, gap 4 is the need for testing of holistic measures of supply chain performance.

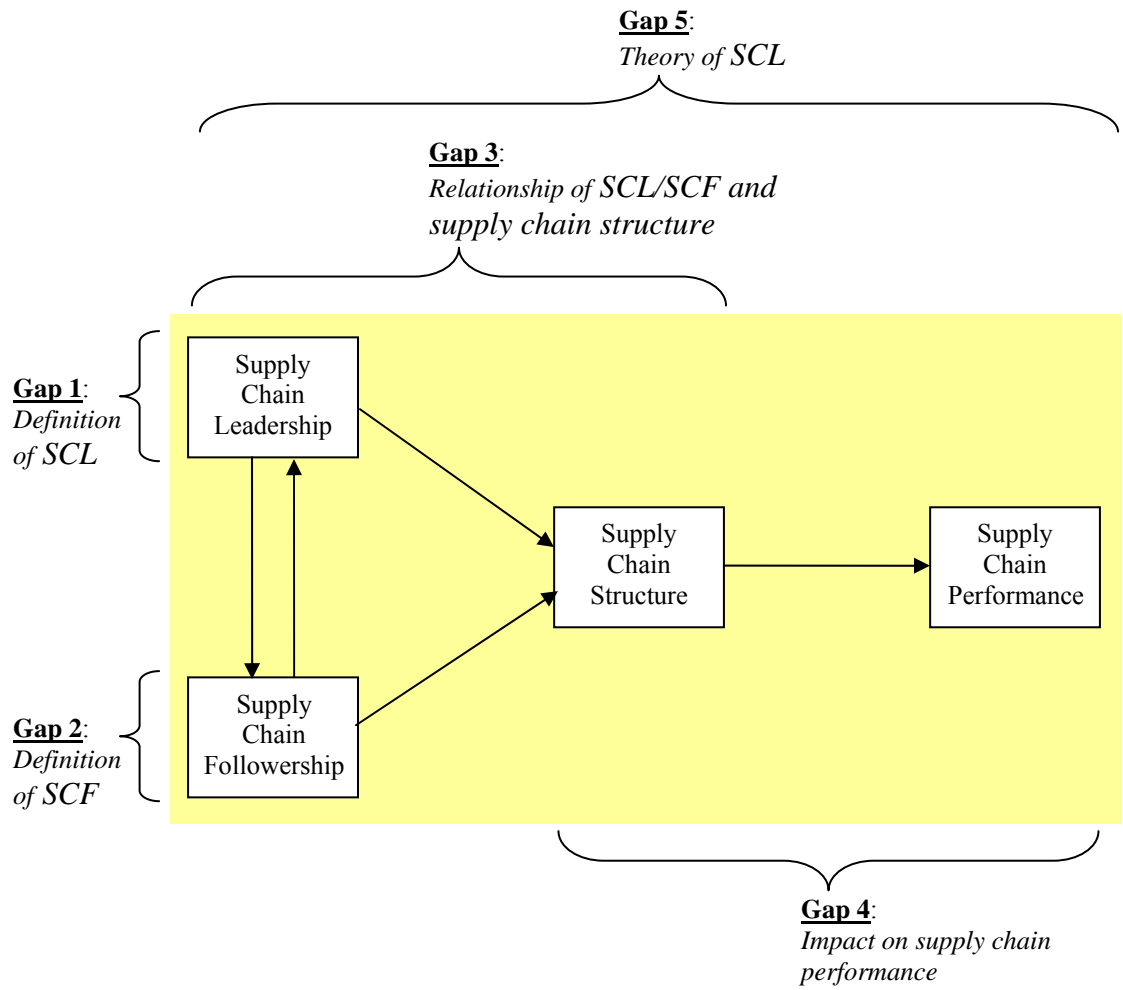
### *The Need for Theory to Explain Supply Chain Phenomena*

There is a need for rigorous theory that assists in the explanation and prediction of supply chain phenomena (Mentzer and Kahn 1995; Mentzer, Min, and Bobbitt 2004). One approach to theory development is to utilize theories developed in other disciplines (Stock 1996). Transformational leadership theory is a widely recognized theory in the social sciences (Bass 1990) that has not been applied in a supply chain context. Transformational leadership has been examined exclusively as a managerial level concept to date, but previous research into related concepts such as trust (Doney and Cannon 1997) suggests the theory can be applied at the organization level.

Transformational leadership theory posits all leaders use transactional behaviors at times, but the most effective leaders employ more transformational behaviors (Hater and Bass 1988). Thus, leaders should not be perceived as either transactional or transformational, rather leaders can be categorized as more transactional or more transformational based upon their set of behaviors. This set of behaviors represents the leadership style portrayed by the leader. Transactional versus transformational leadership styles can also be applied to organizations found in supply chains, and should be measurable based upon the characteristics of each member's supply chain relationships.

The lack of solid definitional footing around the concept of SCL antecedes the fact that no theory exists to explain leadership in supply chains. At best researchers know how to describe a supply chain leader but are limited in their ability to make any important theoretical predictions of SCL and its consequences. Gap 5 is the need for an empirically testable theory of SCL. Figure 1.1 presents a visual portrayal of the knowledge gaps that will be explored in this dissertation.

**Figure 1.1: Supply Chain Knowledge Gaps**



## **STATEMENT OF PURPOSE**

SCL has been inconsistently defined, and the mirrored concept of SCF is not found at all in the literature. This may partially explain why no theory of SCL exists that can be used to explain and predict supply chain performance. This is an issue of great importance to the discipline because SCL is a necessary precondition for the implementation of SCM, and thus is also a prerequisite for firms striving to create a competitive advantage through enhanced supply chain performance. The primary purpose of this dissertation is to develop and test a theory of SCL. The proposed theory fills a significant gap in the body of knowledge and serves to clarify the SCL concept and introduce the concept of SCF to the discipline. The investigation also serves several secondary purposes.

First, because existing definitions are inadequate, a clarified definition of SCL will be developed in conjunction with a review of the leadership literature. The clarified definition benefits the discipline by precisely describing the concept and elevates its importance by placing it in the context of workable theory. SCF will also be defined to allow for common interpretation and to completely describe the domain of SCL theory.

Second, a practical application and test of SSP in a supply chain theoretical context has been called for on many occasions (Bowersox, Closs, and Stank 1999; Chow, Henrikssen, and Heaver 1995; Rodrigues, Stank, and Lynch 2004; Stank and Traichal 1998; Stock, Greis, and Kasarda 1999) and holds the potential to enhance our understanding of supply chains. Previous empirical tests have been limited in scope and a more comprehensive test of SSP theory is needed (Rodrigues, Stank, and Lynch 2004).

This dissertation will provide an expanded test of structural dimensions and further test the structure-performance link by incorporating end-to-end performance measures.

Third, new insights become available to logistics researchers by utilizing theories developed in other disciplines (Stock 1996). The use of transformational leadership and SSP are in line with this recommendation. Supply chain research is a cross-disciplinary field, and any theory attempting to explain supply chain outcomes must be robust enough to deal with the complexity of the phenomenon. Transformational leadership and SSP are drawn from extensive research pools and have attained paradigmatic status in their own disciplines (Bass 1985a; Galunic and Eisenhardt 1994).

Fourth, a field of research may underachieve if it is conducted within a narrow methodological domain (Dunn, Seaker, and Waller 1994; Sullivan 1998), while the use of differing methods of investigation provide for new understandings to be gained (McGrath 1982; McGrath, Martin, and Kula 1982). Logistics and supply chain research has been dominated by quantitative methods, specifically analysis of survey data that has increasingly been plagued by problems of very low response rates, over-sampling of the same response base, and reduced statistical power associated with small sample sizes. Understanding of logistics and supply chain phenomena can be enhanced through the use of methods that differ from those used in the past. This dissertation will use an experimental design approach to investigate SCL. Experimentation is a methodology seldom found in logistics research.

### **Research Questions**

The gaps identified in the body of knowledge and echoed in the statement of purpose highlight the opportunities for research sought by this dissertation. Leadership

and followership styles identified in the questions listed below are developed in greater detail in Chapter 2. The transformational-transactional view of leadership is utilized to describe the SCL and SCF styles exhibited by supply chain member organizations. SSP provides the theoretical framework to identify supply chain outcomes. The following research questions guide the investigation:

1. How should leadership be defined in the inter-organizational context of supply chains?
2. How should followership be defined in the inter-organizational context of supply chains?
3. What leadership styles can be attributed to supply chain leader organizations as viewed through the lens of transformational leadership theory? What followership styles can be attributed to supply chain follower organizations as viewed through the lens of transformational leadership theory? What attributes describe SCL and SCF styles?
4. Do supply chain leader organizations possessing differing leadership styles develop supply chains with different structural configurations? Are structural configurations influenced by the followership styles of member organizations?
5. Do supply chain leader organizations possessing differing leadership styles develop supply chains with different levels of performance at the overall supply chain level? Is holistic supply chain performance affected by the followership styles of member organizations?

### **Potential Contributions of This Research**

The development of theory is a central goal of scientific endeavor (Kerlinger and Lee 2000), and this dissertation supports that goal in multiple ways. First, a new theory of SCL is proposed. The theoretical model described in Chapter 2 is built upon more precise definitions of SCL and SCF than exist in the literature currently. Inclusion of SCF in the theory meets an important requirement of theory development -- that theories must accurately describe the domain of relevance (Spender 1979). A theory of SCL that



excludes SCF does not meet that standard. Of additional importance is the recurring call for theory needed in the logistics and supply chain fields (Mentzer, Min, and Bobbitt 2004), and the theory developed in this proposal addresses that need. The proposed definitions of SCL and SCF provide a means for greater understanding of the concepts.

The theory of SCL proposed in this dissertation is built using widely researched and well-respected theories from the leadership and strategic management disciplines. This investigation marks the first known attempt to leverage transformational leadership theory in the supply chain environment. A potential contribution returned to the leadership discipline is the elevation of transformational leadership from the traditionally conceived managerial level to organizational level leadership in supply chains.

To be useful theory must be testable (Hunt 1991), and the proposed theory of SCL will be tested using an experimental research design. Experimental design is a core research method used throughout the social sciences. Empirical testing of SSP in a supply chain context is extended by this dissertation. The empirical limitations of earlier research in the area are addressed by inclusion of the multiple structural elements considered and the measurement of holistic performance.

Managers will also benefit from this research. By providing a framework through which to view SCL as either transformational or transactional, managers may gain a greater understanding of the nature of the relationships in which their companies are involved today. This understanding may provide managers the information necessary to make “stay or go” decisions concerning existing supply chain relationships. For example, firms wishing to deal transactionally with their partners may choose to reassess relationships with transformational organizations. The reverse is also true. Also, because

performance is described as a consequence of SSP and SCL, managers may use the proposed theory to diagnose performance problems in their own supply chains. These problems may arise from mis-matched SCL and SCF styles or structural elements that do not properly align between members. Understanding of the roots of performance problems allows practitioners to take corrective actions immediately.

## **DISSERTATION ORGANIZATION**

This dissertation is organized into five chapters. Chapter 1 is the introduction and provides an overview of the topic area and rationale for studying the phenomenon of supply chain leadership. Transformational leadership theory and SSP theory are established as the theoretical foundation of the research. This chapter highlights gaps in existing knowledge, the statement of purpose, key research questions, potential contributions of the study, and outlines the organization of the dissertation.

Chapter 2 provides an in-depth review of the relevant leadership, followership, and supply chain structure and performance literatures. This background information provides the foundation used to build the theory for this dissertation. Research hypotheses associated with the theoretical model are presented. Chapter 3 describes the research methodology used to test the proposed model and associated hypotheses. This chapter explains the research design and justification for the design choice, sample selection, measure development and purification, data collection method, and data analysis procedures. Chapter 4 presents the empirical supply chain leadership article developed based on the analysis of results from this research. Chapter 5 presents a conceptual article of supply chain followership developed from this research.

## **CHAPTER 2 – BUILDING THE THEORY**

In the logistics and supply chain disciplines there is a continuing need for theory to explain the fast-evolving domain (Mentzer, Min, and Bobbitt 2004; Stock 2002). Developing supply chain theory is especially challenging because inter-organizational phenomena are inherently complex and dynamic (Levy 1995; Parkhe 1993), making them difficult to observe and measure. Recent supply chain trends suggest complexity is increasing. For example, many supply chains are driven by increasing forces of globalization (Mentzer 2001) stretching supply chains across borders and making them more susceptible to foreign market uncertainty (Rivoli and Salorio 1996), country risk (Aulakh and Kotabe 1997), and differences in national culture (Kogut and Singh 1988).

A topic that has received little attention in the discipline is supply chain leadership. This dissertation attempts to further understanding of this phenomenon through the development of a theory of supply chain leadership. Theory development is facilitated by the use of two broadly researched theories from other disciplines: transformational leadership theory and SSP theory. This chapter begins with a review of relevant literatures to provide important background on transformational leadership, followership, supply chain structure, and supply chain performance measures. The conceptual model of SCL is then introduced and supporting hypotheses are developed.

### **LEADERSHIP RESEARCH AND THEORY**

Leadership has been a topic of considerable interest in social science disciplines including organizational behavior, psychology, political science, military science and strategic management (Bass 1990; House and Aditya 1997) with early studies published

over 150 years ago (Carlyle 1841/1907; Galton 1869; Spencer 1884). While the study of leadership has a long history, it is not necessarily all that well understood.

“The term (leadership) connotes images of powerful dynamic persons who command victorious armies, direct corporate empires from atop gleaming skyscrapers, or shape the course of nations. Much of our conception of history is the story of military, political, religious, and social leaders. The exploits of brave and clever leaders are the essence of many legends and myths. The widespread fascination with leadership may be because it is such a mysterious process, as well as one that touches everyone’s life” (Yukl 2001).

This section provides a literature review of the past and current thinking in the field of leadership and describes the evolution of research trends.

### **Roots of the Leadership Discipline**

Leadership is considered by many to be a universal concept (Bass 1997). All known societies exhibit at least some form of leadership (Murdock 1967). The study of leadership has been an area of interest for thousands of years. Egyptian hieroglyphics written 5,000 years ago include references to “leadership,” “leader” and “follower” (Bass 1990). Legendary leaders are described in the writings of ancient civilizations such as Greece, Iceland, and China. Leadership is closely linked to the development of civilized societies, and societal norms and myths have been created to justify the dominance of leaders and the deference of the followers (Paige 1977). Despite this ample history, the systematic study of leadership did not flourish until the 1930s (House and Aditya 1997).

Interest in the topic of leadership has accelerated in recent years. It is among the most covered subjects of both the popular and scholarly press. More than 2,000 books on the subject were published in 1999 alone (Brown 2003). Over 16,000 offerings are available for purchase under the topic of leadership at a large online bookseller

(www.amazon.com). In excess of 1.2 million postings on leadership are found through a popular search engine (www.scholar.google.com). Much of this prodigious volume of work should be classified as anecdotal (Maxwell 1998), experiential (Giuliani 2002; Slater 1999), retrospective (Phillips 1992), or pseudo-empirical (Covey 1990; 1989) rather than theoretically grounded. This does not imply a lack of scholarly studies -- empirical research abounds in leadership and social science journals. The recognized compendium of theoretical research in the field lists over 7,500 citations (Bass 1990).

Opinions differ concerning leadership's impact on organizational performance outcomes. On one hand, "leadership is often regarded as the single most critical factor in the success or failure of institutions" (Bass 1990, p. 8). In studies of executive succession, the effects of leadership have been found to explain as much as 45% of an organization's performance (Day and Lord 1988). On the other hand, attribution theory posits organizational outcomes are primarily determined by other factors, and leaders are simply credited with the results after the fact (Calder 1977). Thus, followers are conditioned to ascribe results caused by external events such as economic or social forces to the leader, as in romantic fiction (Meindl and Ehrlich 1987). The weight of empirical research has found leadership to be a contributing factor to organizational success and performance, and is associated with learning organizations (Senge 2001; Vera and Crossan 2004), innovative organizations (O'Regan, Ghobadian, and Sims 2006), organizations recovering from crisis (Heifetz 1994), and organizations viewing leadership as a strategic source of competitive advantage (Waldman et al. 2001).

A complication to the study of leadership is the lack of consensus around a definition for the domain of interest. The leadership literature has been called a

“veritable Tower of Bable” fueled by confusion between overlapping descriptions of managing and leading (Kent 2005, p. 1010). Consistent with this issue is the perspective suggesting the literature has been dominated by studies of management inappropriately described as leadership until recently (Phillips 1992). Additionally, the literature has been criticized for being too closely based on Western business culture, with the vast majority of empirical evidence originating in the United States (House and Aditya 1997).

### **Trends in the Study of Leadership**

The study of leadership has evolved greatly since the early 1900s (Hunt 1999). Multiple theories of leadership have been suggested. The earliest theories lack predictive power, are generally leader-oriented, and do not consider followers to be an important part of the leadership process. Recent theories incorporate both leaders and followers in a relationship as a required condition for leadership behavior to take place. Several authors have developed taxonomies of leadership research that, when taken together, help organize the leadership landscape (Bass 1990; Heifetz 1994; House and Aditya 1997; Yukl 1998). A synthesis of their work is used to organize past research and identify overarching trends.

#### *Leader-centric Theories of Leadership*

Probably the first theory of leadership, and one that still resonates within American and Western European culture is *Great Man* theory (Heifetz 1994). This school of thought emerged during the 19<sup>th</sup> century and is based on the assumption that history is shaped by the actions of great men (Bass 1990). Carlyle’s seminal work (1841/1907) crystallized this view in describing heroes throughout history. The essence

of great man theory is that leaders are endowed with unique qualities that allow them to capture the imagination of others (Bass 1990). Great man theory assumes *leaders are born* with their greatness. This thinking was reinforced by the line of inquiry into the hereditary background of royal rulers (Galton 1869; Woods 1913). Great man theory is not empirically testable *per se*. It provides a framework for assigning responsibility for historical events to the person or people in positions of authority at the time. The roots of trait theory can be found in the great man view as researchers have attempted to deconstruct great leaders of the past to identify personality or other characteristics as the source of their greatness (for example see Jenkins 1947; Smith and Krueger 1933). Bass (1990) suggests great man theory persists today in the examples of transformational leaders such as Winston Churchill, Martin Luther King, and General Norman Swartzkoff.

An opposing view was taken by *situationalists*. This view holds that the situational factors of the times determine who will emerge as a leader, rather than the greatness of the leader influencing the events of the day (Hemphill 1949; Spencer 1884). The leader emerges from the pack to take the reigns at a critical moment in time because of the unique skill set s/he possesses. The underlying assumption of this view is that *leadership ability resides in most or all members of a given group*, and the type of leadership that develops will surface as a result of the challenges faced by the group (Bogardus 1918). At a macro level, situational theory asserts that the events of the period call for the emergence of a leader with a specific set of talents that “fit” the moment. From a situationalist perspective, Washington, Jefferson, Madison, Franklin and other framers of the United States system of governance are seen as the best match for the times, rather than great men that rose above the crowd (Heifetz 1994).

The first systematic research into leadership focused on the universal personal characteristics, or *traits*, that differentiate leaders from non-leaders (House and Aditya 1997). The majority of this work was created in the 1930s and 1940s, and a wide variety of traits are explored under this research paradigm. Bass' (1990) meta-analysis of the period reveals several traits to be consistently associated with leadership, including intelligence, scholarship, dependability, social participation, and socioeconomic status. Other traits have been suggested that may consistently distinguish leaders from followers including physical energy (Simonton 1994), prosocial influence motivation (House and Baetz 1991; McClelland 1975), self-confidence (House 1977), achievement motivation (House, Spangler, and Woycke 1991), power motivation balanced with the moral exercise of power (McClelland 1985; 1975), and flexibility (Kenny and Hallmark 1992). The search for traits that can be used to distinguish leaders from non-leaders continues to be of great interest as antecedents to various leadership styles (for example, see Bono and Judge 2004 for an evaluation of personality traits examined in recent leadership studies).

The *behavioral* school of leadership was led by work emanating from Harvard (Bales 1954), Ohio State (Stogdill and Coons 1957), and the University of Michigan (Kahn and Katz 1953; Likert 1961). This research has been based primarily on the behaviors attributed to "leaders" found at middle and lower levels of organizations (House and Aditya 1997). These studies have been frequently criticized for lacking generalizability because of the supervisory nature of the subjects studied -- i.e., the person in charge is actively involved in *managing* the tasks of subordinates rather than leading a group of followers. The findings of this stream of research have also been questioned because many of the most widely used behavioral questionnaires lack validity



(Schriesheim, House, and Kerr 1976). A significant outcome of these studies is the classification of leader behaviors falling into one of two categories: task-oriented, and person-oriented. Task-oriented behaviors have subsequently been re-classified as managerial behaviors that arguably fall outside the domain of leadership (Kent 2005).

Stogdill (1948) called for a synthesized view considering the interaction of traits and situational issues experienced by the leader. This *contingency* theory of leadership is founded on the belief that the appropriate leadership style is dependent on the variables presented by a particular situation (Heifetz 1994). This view has been supported by studies that posit traits need not be stable across long periods of time, and can be used to predict leader behavior under a sub-set of conditions rather than across all possible situations (Schneider 1983). Contingency theory was later extended beyond very short-term “snapshot” views of behavior, to include the proposition that individual personality dispositions may be stable over long periods of time. These stable traits may be used to predict behavior in the short-term which results in long-term consequences (House, Shane, and Herold 1996). The contingency view remains popular, and as leadership has become ever more established as a *relationship* concept symbolized by the interaction between leaders and followers (Kouzes and Posner 1990; 2004), this view has expanded to include explicit follower characteristics and goals (Bass 1990).

### *Relationship-oriented Theories of Leadership*

One of the first theories expanding the domain of leadership to include leaders and followers in a two-way relationship is *path-goal theory* (House 1971; House and Mitchell 1974). The theory was originally developed as a situational, or context-specific, theory meant to describe the dyadic relationship between supervisors and subordinates

(House and Aditya 1997). Path-goal theory suggests that effective leaders work to ensure followers understand the task at hand, and reduce roadblocks that may otherwise get in the way of followers' ability to succeed at the task (House 1971; Schriesheim and Neider 1996). The theory incorporates the triad of leader behaviors, follower characteristics, and environmental contextual elements into a broadened model of leadership (House and Mitchell 1974). The effective leader must weigh the situation defined by follower and environmental characteristics and adjust his/her behavior accordingly.

Findings of path-goal theory were inconsistent (Schriesheim and Neider 1996; Schriesheim et al. 2006), leading to a re-conceptualized path-goal theory that expands the relationship concept by linking leaders to entire work groups (House 1996). Leaders may exhibit a similar pattern of behaviors toward an entire group of followers in some contexts, while exhibiting different behaviors toward individual followers at other times. The theory predicts leadership behavior affects followers based upon each follower's perception of the leader's behaviors. The work group the follower belongs to will exert less influence (House 1996), making the effectiveness of follower behavior unique to each follower. This individual-level effect of leader behaviors on follower performance and satisfaction has been confirmed empirically (Schriesheim et al. 2006).

Leader-follower relationship dynamics have most often been explained as a type of *social exchange* (Bass 1990). Under this theory, leaders and followers initiate a relationship through negotiation to decide what each party is willing to exchange (Hollander 1958; 1978). A typical social exchange in the workplace may include the leader offering guidance concerning the approach the follower should take to successfully complete a task. The follower responds by agreeing to complete the task in line with the

leader's wishes. The behaviors of both leader and follower are then reinforced by either rewarding satisfactory behavior or punishing unsatisfactory behavior. This dynamic leader-follower exchange view, also called the *transactional leadership* view, formally incorporates the relationship between leader and follower as a baseline requirement for leadership (Bass 1990; Heifetz 1994).

Transactional leadership theory is easily distinguished from earlier leader-centric theories by the acknowledgement of the leader-follower relationship. Transactional theory is based on reciprocity between the leader and followers, and assumes both parties influence the other's behavior (Heifetz 1994; Hollander 1978; Kouzes and Posner 1990). Under transactional leadership both leader and follower obtain something of value (Humphreys and Einstein 2003). Leader control of the exchange is maintained through contingent reward of a task completed acceptably or contingent punishment following failed tasks (Bass 1985a). Management-by-exception may be used by the leader to simplify performance monitoring requirements. The leader-follower relationship does not extend beyond the boundaries of the exchange (Burns 1978).

*Leader-member exchange theory* (LMX) attempts to explain the reciprocal influence of leaders and followers on the other party (Graen 1976). The results of such a relationship are expected to be generally positive, including higher follower performance, citizenship behavior, satisfaction and commitment, and lower turnover (House and Aditya 1997). The theory focuses on relationships rather than the traits or behaviors of either the leader or follower(s). Leaders convey role expectation onto followers, and as in transactional exchange leaders provide rewards to followers that meet expectations. However, followers do not passively accept the roles laid out for them, and may choose

to embrace, reject or re-negotiate the role as originally prescribed by the leader (Wang et al. 2005). High quality LMX is distinguished from basic transactional exchange by several key characteristics developed via the relationship including: trust, respect, mutual obligation, openness, mutual loyalty, mutual influence, and follower latitude to act (Graen 1976; Graen and Uhl-Bien 1995). Follower respect and loyalty to the leader grow as a result of favorable treatment by the leader, with the result seen as excellent task performance and effort. Unfortunately, LMX has not shown a consistent association with performance (House and Aditya 1997).

For a time, leadership theory appears to have hit a theoretical wall. One noted author summed up by stating “the concept of leadership has outlived its usefulness. Hence, I propose we abandon leadership in favor of some other more fruitful way of cutting up the theoretical pie” (Minor 1975). Following this “gloom and doom” period of leadership, a paradigm shift occurred in the 1970s with the conceptualization of *transformational leadership* (Hunt 1999). Transformational leadership is one of several neocharismatic theories of leadership. The category also includes charismatic leadership theory (House 1977), visionary leadership theory (Bennis and Nanus 1985), and value-based leadership theory (House, Shane, and Herold 1996). This new theory of leadership has become the dominant paradigm in leadership research (Bass 1999). The essence of transformational leadership is found in the leader’s ability to transform the hearts and minds of followers to higher levels of motivation and performance than would be expected without the leader’s influence (Perry 2000). The payoff emerging from the transformational paradigm is that transformational leaders are more effective than their transactional counterparts -- transformational leaders are considered the “real movers and

shakers of the world” (Bass 1990, p. 23). Transformational leadership is covered in greater detail in a later section of this chapter.

### **Defining Leadership**

The diversity of research produced from the many theories of leadership put forward places a significant limitation on future investigations because no agreement exists concerning the definition of leadership. The definitions developed in the literature tend to be linked to each author’s research stream rather than shared across competing views (Yukl 1998). A generally held conclusion is that there are practically as many definitions of leadership as there are authors who have attempted to define the concept (Stogdill 1974). Thus, leadership research suffers from a lack of precision in defining the phenomenon (Janda 1960). The issue is further complicated by a set of imprecise terms used in association with, or overlapping the concept of leadership (Kent 2005). For example, power, authority, management, administration, control and supervision have each been used to describe leadership (Yukl 2001).

The confusion found in the literature concerning the many definitions of leadership represents a significant gap in our understanding. A clear definition of leadership is needed. It must be comprehensive yet general enough to cross the boundaries of multiple streams of research. Also, the concept of leadership needs to be clearly delineated from the related concept of management. This section is intended to address these gaps. First, reasons for the many incompatible definitions of leadership are presented. Next, several closely related concepts are explained. Then, critical elements of the definition of leadership used in this dissertation are identified.

### *Many Different Definitions of Leadership*

Definitions of leadership abound. This is true for three primary reasons. First, the study of leadership extends across many separate disciplines including psychology, sociology, political science, military science, and business. The phenomena of interest, and the level of analysis found in these disciplines are not always consistent, and therefore researchers develop definitions that reflect the existing paradigms in each field. Studies of leadership in military and political science are largely based on the leader possessing legitimate authority because of his/her position of superiority over a group. Additionally, these disciplines assume the relationship is between the leader and an extended group of many followers the leader can never form a direct relationship with. Studies of organizational behavior found in psychology and business often define the leader based on criteria other than legitimacy. When leadership is not limited to those possessing legitimate authority, leadership is more likely to be described as falling to a member of the group other than the person at the top of the organization.

Second, the most significant research streams conceive of leadership as emanating from vastly differing sources. As such, the different streams tend to place importance on different elements. For example, trait-based theory considers leadership to be created from a set of characteristics within the leader him/herself. The behavioral school finds leadership in the actions consistently displayed by the leader. Each view focuses in on a conceptualization of leadership as something different. This distinction is also seen in the very different perspective of leader-centric theories and relationship-oriented theories of leadership. A perspective that assumes the role of the leader is to impose his/her world

view on a group of followers (leader-centric) is very different from one that considers leadership a result of leader-follower co-influence (relationship-oriented).

Third, it has been clearly stated that a shortcoming of theory development in leadership is the failure of researchers to build on the efforts of past authors (Yukl 2001). Because leadership researchers have tended to continually “re-design the wheel” to fit their own needs, it should not be surprising that new definitions of leadership put forward are aligned more with the latest theory than with a consistent view of the domain.

### *Concepts tied to Leadership*

Several terms closely related to leadership have been used interchangeably in the leadership literature. Each must be clearly defined to ensure the adopted definition of leadership is precise and can be easily understood and applied. These include the concepts of power, power bases, influence, influence strategies, authority and control. Each of these terms is defined in this section.

*Power.* Power has been defined as “potential influence” (French and Raven 1959, p. 152), and as “the amount of resistance on the part of B (the target) which can be potentially overcome by A (the agent)” (Emerson 1962, p. 32). Power is not to be considered an attribute of the agent, but rather is found in the social relationship between the leader and follower, and implicitly in the follower’s dependence on the leader (Emerson 1962). In a leadership context the existence of power provides a way to distinguish leader from followers.

*Bases of Power.* Power is described as residing in six distinct power bases (French and Raven 1959; Raven 1965). Bases of power are “those characteristics of a

person that give him or her the ability to influence others” (Venkatesh, Kohli, and Zaltman 1995, p. 74). The sources of power most frequently described are defined as:

- *Legitimate power*: the extent to which the follower is obliged to comply with the leader’s request because of organizational norms and/or the leader’s position of authority.
- *Reward power*: the ability of the leader to control the distribution of tangible and intangible benefits desired by the follower (or the ability to withhold punishment).
- *Coercive power*: the ability of the leader to mete out tangible or intangible punishments which followers wish to avoid (or the ability to withhold rewards).
- *Referent power*: the follower’s attraction toward, or desire to emulate or “be like” the leader.
- *Expert power*: follower compliance is rooted in the belief the leader possesses special knowledge and/or expertise.
- *Information power*: the extent to which the leader controls access to relevant information important to the follower’s success (adapted from French and Raven 1959; Raven 1965; Venkatesh, Kohli, and Zaltman 1995; Yukl 1981).

Although reward and coercive power are presented as separate bases of power, the two concepts have a high degree of overlap (French and Raven 1959). Is withholding a reward actually a punishment? Is withholding a punishment actually a reward? In fact, reward and coercive power may be better represented as a single dimension (Kohli 1989). Researchers have tended to describe and test these two power bases separately (Venkatesh, Kohli, and Zaltman 1995; Yukl 1981), so the distinction is maintained here. Expert and information power are also closely related concepts. Many descriptions in the literature exclude information power for that reason. Maintaining the distinction between these sources of power may be useful because expertise possessed by an individual is different from that individual’s ability to control access to information. The leader may possess a certain expertise which s/he may share (expert power) or not (information



power). Actual expertise is not necessary for expert power to exist. Expert power is granted the leader because the follower *believes* the leader possess some special knowledge. Alternatively, the leader may wield control over some type of information. By acting as an information gatekeeper the leader exerts information power. Thus, the distinction between these concepts is also maintained.

*Influence.* Explicit definitions of influence have been provided relatively infrequently in the literature, and have occasionally been confused with power (Kohli and Zaltman 1988). Yukl (1981) describes influence as *the effect of the actions of one party (the leader) on another party (the follower)*. French and Ravin (1959) consider influence to be the resultant force on the target which has its source in the act of the agent. Influence must be measured in terms of the psychological change that takes place in the behavior, opinions, attitudes, goals and values of the target (French and Raven 1959; Raven 1965; Yukl 1989). Thus, the distinction between power and influence can be represented by power being the *potential* for a change to occur, and influence being manifested as the *actual act* causing the change. Using this description it is evident that *both* power and influence are necessary to provide a complete description of leadership.

*Influence Strategies.* Leader characteristics, including power, may determine the type of influence strategies that are most effective in a given situation (Frazier and Summers 1986; Venkatesh, Kohli, and Zaltman 1995). Yukl (1981) identifies a typology of 11 influence strategies available to leaders. Venketesh, Kohli and Zaltman (1995) empirically test six influence strategies. Table 2.1 summarizes the influence strategies considered in this study. The strategies are categorized as either an extension of the power bases (power-linked), or as not relying on one of the power sources (non power-

**Table 2.1: Influence Strategies Available to Leaders**

Form of Influence	Description	Power Base
<b><i>Power-linked strategies</i></b>		
Legitimate request / Legalistic plea	Leader uses formal authority vested in position or contractual agreement, or informal authority based on group norms to obtain follower compliance.	Legitimate power
Instrumental compliance	Leader alters follower behavior on the basis of follower desire to achieve a desired outcome.	Reward power
Coercion	Leader makes implicit or explicit threats as a means of eliciting a specific follower behavior.	Coercive power
Personal identification	Follower chooses to imitate the behavior or develop attitudes similar to those of a greatly admired leader.	Referent power
Recommendation	Leader suggests following a specific course of action is likely to be beneficial.	Expert power
Information distortion	Leader is in control over information needed by follower to perform his/her role effectively. Distortion may occur when information is presented selectively or falsely.	Information power, may be combined with Coercive power
<b><i>Non Power-linked strategies</i></b>		
Rational persuasion	Leader does not possess control over benefits and attempts to convince follower with logical arguments that the suggested course of action is the best approach available for the follower to achieve his/her objectives.	NA
Rational faith	Leader does not possess control over benefits, but obtains compliance because follower is willing to act out of faith in the expertise and credibility of the leader.	NA, however may be linked to Expert power
Inspirational appeal	Leader induces follower to do something because it is a necessary expression of his/her values and ideals.	NA
Situational engineering	Leader manipulates relevant aspects of the physical and social situation, thus constraining follower's range of choices.	NA
Decision identification	Leader encourages follower to participate in the decision process to ensure ego involvement and enthusiastic support for the decision.	NA

Adapted from Yukl (1981); Venkatesh, Kohli and Zaltman (1995).

linked). Each strategy describes a leader action or behavior. Arguably the power-linked strategies represent a complete list of this category because each power base has been further manifested as an influence strategy. Other non power-linked strategies may exist that are not clearly described in the literature. The existence of non power-linked strategies suggests that leadership does not require an easily identified power base.

*Authority.* The concept of authority is often equated with leadership in everyday language (Heifetz 1994). Authority is defined as *the right of the leader to demand compliance based on organizational role or group norms* (Emerson 1962; Heifetz 1994; Jacobs 1970). Authority is generally associated with legitimate power.

Authority may be formal or informal. Formal authority is closely tied to the concept of organizational position power in which the superior -- e.g., boss, manager, supervisor, foreman -- is granted the ability to demand compliance from subordinates because of his/her higher ranking role in the organization (Yukl 1981). The manager-worker relationship is typically based, at least in part, on formal authority. Informal authority is developed when an individual is granted the ability to lead by other group members because of a shared norm or other characteristic deemed important by the group (Heifetz 1994). Informal authority is retained only so long as it continues to be offered by the group. Authority should not be confused with leadership, especially in the context of leadership developed in this dissertation. Formal authority is a facilitator of legitimate power. Informal authority may be more closely linked with referent or expert power.

*Control.* Control is often an implied, but desired outcome of leadership. This is especially true of the older, leader-centric leadership theories founded on the desire of the leader to exert control over followers. Unfortunately definitions of control appear to be

implied in the literature, rather than explicit. Dictionary definitions seem to fall into the trap of using power and influence interchangeably. For example, one definition is *to exercise authoritative or dominating influence over others* ([www.dictionary.com](http://www.dictionary.com)). Another source substitutes power for influence in an otherwise identical definition ([www.wordweb.com](http://www.wordweb.com)). This dissertation will adopt the first definition because influence has previously been defined as an action and power as potential. Leaders may use the power bases available to them to exert control over followers and manage conflict (Brown and Day 1981; Cadotte and Stern 1979; Etgar 1979; Gaski 1984; Gaski and Nevin 1985; Hunt and Nevin 1974). Control may be less important to current theories of leadership because emphasis has shifted to leader-follower pursuit of mutually-held goals (Tickle, Brownlee, and Nailon 2005). This tends to lessen the need for control by leaders as followers take more ownership of organization goals (Bass 1990) and express greater satisfaction with their leader (Bass 1999; Humphreys and Einstein 2003).

Each of the terms described above have been used in conjunction with leadership definitions and theories. The sampling of leadership definitions presented next shows how these distinct concepts have been used to describe the same phenomenon. The purpose of the following section is to identify the appropriate elements of a definition of leadership that will be adopted for this dissertation.

#### *Creating a Broad-based Definition of Leadership*

Traditionally, leadership has been defined as *a process of influencing individuals or groups in order to achieve group goals* (Hoyt and Blascovich 2003). These elements represent foundational properties of a definition of leadership. Unfortunately, available definitions diverge beyond the common elements of (a) influence processes, and (b) the

assumption that leadership is a group phenomenon (Yukl 2001). With that as a starting point, several definitions are considered as a basis for developing an adapted definition used in this dissertation. The definitions presented are selected because they clearly state consistently used elements of leadership found throughout the literature. Nine definitions of leadership are listed in Table 2.2.

Earlier definitions of leadership, as characterized by the Hemphill and Coons (1957) definition, are leader-centric, and based on an assumption that followers' behavior is shaped by a more knowledgeable leader (Kouzes and Posner 1990; Shamir 1999). The concepts of *power* and *authority* are evident in Janda's (1960) definition, and are central to much leadership research. Specifically, bases of power (French and Raven 1959) and power-dependence theory (Emerson 1962) have been extensively used to explain leader-follower behavior. Jacob's (1970) definition can be simplified as *influencing others without authority* and brings into question the requirement that leadership is vested in a position of superior authority. This definition enlarges the domain of leadership, and appears to be in rhythm with the drive to develop leaders through executive education programs found in many organizations in recent years (Fuller 2001).

The belief that leadership may result in organizational *performance beyond expectations* is provided by Katz and Kahn (1978). This thinking is aligned with the neocharismatic, or *new school* of leadership first developed in the late 1970s (Burns 1978; House 1977). A commonly described characteristic of leaders is their ability to develop and articulate a *vision* that serves as a rallying point for the organization (Richards and Engle 1986). Heifetz (1994) describes effective versus ineffective leaders and concludes the ability to project a vision is essential for leader effectiveness.

**Table 2.2: Example Definitions of Leadership**

---

Definition	Source
The behavior of an individual when he is directing the activities of a group toward a <i>shared goal</i> .	Hemphill and Coons (1957) , p. 7
A particular type of <i>power relationship</i> characterized by a group member's perception that another group member has <i>the right to prescribe behavior</i> patterns for the former regarding his activity as a group member.	Janda (1960), p. 358
An interaction between persons in which one presents information of a sort and in such a manner that the other becomes convinced that his outcomes (benefits/costs ratio) will be improved if he behaves in the manner suggested or desired.	Jacobs (1970), p. 232
<i>The influential increment over and above mechanical compliance</i> with the routine directives of the organization.	Katz and Kuhn (1978), p. 528
Articulating <i>visions</i> , embodying values, and creating the environment within which things can be accomplished.	Richards and Engle (1986), p. 206
The ability to step outside the culture to <i>start evolutionary change</i> processes that are more adaptive.	Schein (1992), p. 2
A process of <i>disproportionate social influence</i> in which the party that exerts greater influence on others (the leader) can be identified.	Shamir (1999), p. 51
A process of social influence through which an individual enlists and mobilizes the aid of others in the <i>attainment of a collective goal</i> .	Hogg, Martin, and Weeden (2003), p. 20
<i>A reciprocal process that occurs between people...a relationship between those who aspire to lead and those who choose to follow.</i>	Kouzes and Posner (2004), p. 2

---

Facilitating *change* is a concept highlighted by Schein (1992). Commitment to a vision and initiating change are concepts central to transformational leadership theory. Shamir's (1999) definition adds the often unstated element that *the leader is identifiable* and different from followers because of his/her greater influence. Both old school (Hemphill and Coons 1957) and new school (Hogg, Martin, and Weeden 2003) definitions describe the need for leaders and followers to target *shared goals*. Finally, Kouzes and Posner (2004) present leadership as a *relational process* that requires the commitment of both leaders and followers.

The essential criteria of a workable definition of leadership are developed from a synthesis of the material outlined above. The criteria are summarized in Table 2.3. These elements are considered essential to the concept of leadership put forward in this dissertation for four reasons.

First, leadership is universally believed to be an influence process (#1) (Yukl 2001). This is true of the one-way influence (Leader → Follower) described in older theories of leadership and the two-way influence processes (Leader ↔ Follower) proposed by more recent relationship-oriented theories.

Second, leadership cannot exist unless the leader can be identified and differentiated from the group on some basis (#2). Generally, the leader is easily distinguished from followers because the leader possesses some base of power (#3). The leader may gain a leadership mandate because s/he occupies a position of authority, or alternatively because of some other reason that proves attractive to followers (#4).

**Table 2.3: Elements of a Conceptual Definition of Leadership**

Influence	Identifiable	Vision	Relational	
✓				1. Leader exerts influence over others.
	✓			2. Leader can be identified separately from followers.
	✓			3. Leader influence is built upon some identifiable source of power.
	✓			4. Leader may or may not occupy a position of authority.
		✓		5. Leader creates and articulates a vision.
		✓		6. Leader identifies the need to change and champions change initiatives.
			✓	7. Leaders and followers are involved in a relationship where each may exert influence over the other.
			✓	8. Leader and followers find a common interest in achieving a shared goal.
			✓	9. Followers may be willing to increase their effort to perform at a higher level because of their identification with the vision and shared goals.



Third, because leaders cannot always rely on positional authority or legitimacy, the ability to create and articulate a vision becomes more important (#5). Without the mandate to lead provided by position in the organization the leader must entice the group to enthusiastically support the effort being led. The vision motivates followers by spelling out a future that has desirable consequences. The vision may also result from the need for change identified by the leader. In this way the vision provides a mechanism for communicating the need for change consistently throughout the organization (#6).

Fourth, leaders and followers inhabit a shared space in the domain of leadership. Both participants exert influence over each other (Grundstien-Amado 1999), and one cannot exist without the participation of the other (Kouzes and Posner 1987). The simplest way to address this is to define the phenomenon as occurring within the confines of a relationship (#7). Followers establish a common sense of purpose with the leader when the vision is accepted or refined in accordance with their own values. This is reflected through goals shared by leader and followers (#8). Performance of the group is expected to increase when followers participate because they believe in the cause, rather than when they are just fulfilling their side of an agreed upon exchange (Bass 1999). Improved performance is caused by the extra effort put forward by followers because they are committed to the vision and share a set of goals with the leader (#9).

Hundreds of definitions of leadership exist in the literature. As expected, no definition is found that meets all of the essential criteria produced from the synthesis of leadership definitions. However, the following passage captures each of the criteria necessary to create a workable definition, and will therefore become the definition of leadership adopted in this paper:

“Leadership is a relational concept that symbolizes the dynamic interaction between the leader and the followers or the people the leader aspires to lead. The leader’s aim is to increase the followers’ compliance with and commitment to the organization’s vision. Vision is a shared image of a desirable future, which the leader articulates and then communicates to the followers. The vision should be shaped and defined by the leader and the followers, yet the leader has to push it forward and communicate it clearly and decisively so that followers will internalize it and fulfill it” (Grundstien-Amado 1999, p. 250).

### *Summary of the Review of Leadership*

The leadership literature spans the social science disciplines and attempts to explain the phenomenon of leadership from many different perspectives (Bass 1990). The many theories proposed over the past century and a half can be placed into two categories. Leader-centric theories that ascribe special talents to the leader and assume his/her ability to influence followers is unquestioned. These theories enjoyed widespread popularity through the mid-twentieth century. Relationship-oriented theories consider leaders and followers as co-contributors to leader, and ultimately, organizational success. Relational theories remain in vogue today, and transformational leadership is the current paradigm in the field (Bass 1999; Bono and Judge 2004; Hunt 1999).

A set of essential criteria was synthesized in this chapter from a sub-set of the many definitions of leadership found in the literature to guide the development of a working definition of leadership used in this dissertation. This definition is further clarified through precise description of several related concepts that have frequently been misapplied in the literature: power, power bases, influence, influence strategies, authority, and control.

## **THE TRANSFORMATIONAL LEADERSHIP PARADIGM**

Like the general study of leadership, transformational leadership concepts can be traced back thousands of years (Humphreys and Einstein 2003) but have only recently been compiled into a cohesive theory. Prior to the identification of transformational leadership theory the leader's role was anticipated to be limited to a series of give-and-take exchanges with followers. This social exchange view of leadership was popular through the late 1970s (Hollander 1978). The leadership-as-exchange view has been overtaken by the transformational paradigm proposed by Burns (1978) and developed by Bass and others (Avolio, Waldman, and Einstein 1988; Bass 1985a; Bass and Avolio 1993; Bass et al. 1987; Hater and Bass 1988; Jung and Avolio 2000; Podsakoff et al. 1990). The essence of transformational leadership is found in the leader's ability to transform the hearts and minds of followers to higher levels of motivation and performance than would be expected without the leader's influence (Perry 2000).

### **Foundations of Transformational Leadership**

Burn's (1978) work forms the foundation of transformational leadership theory, and juxtaposes transformational leadership on a continuum opposite transactional leadership. While transactional leaders enter into an exchange relationship with followers as a way of resolving the needs of both actors, Burns believes transformational leaders go further by seeking to arouse and satisfy higher level needs as defined by Maslow's (1954) hierarchy. This appeal to higher-level, non-immediate needs allows the leader to engage the full person of the follower. The transformational leader is able to raise the consciousness of the follower to see greater possibilities in the future. Simply put, the leader asks the follower to consider two changes: (a) rise above their own

interests for the good of the group, and (b) consider their own longer-term needs to develop rather than only focusing on immediate needs. The expanded vision of the future provided by the leader motivates followers to lift their level of effort in order to achieve these mutually-held, elevated goal(s). Followers become self-directing and self-reinforcing, and as they take on greater responsibilities they themselves become leaders. Burns also held the distinction that a leader's actions were only transformational if society benefited as a result. Thus, Hitler, Stalin, and Jim Jones are not considered transformational leaders by Burns, but Gandhi and Martin Luther King are.

Bass (1985a) expanded on Burns definition with a series of empirical studies that launched a prodigious stream of research (an abbreviated list includes Avolio, Bass, and Jung 1995; 1999; Avolio, Waldman, and Einstein 1988; Bass 1997; Bass 1999; Bass and Avolio 1994a; 1994b; 1990; Bass and Avolio 1993; Bass et al. 2003; Bass et al. 1987). Bass' findings led him to a slightly different definition of transformational leadership than Burns. The differences are found along two dimensions. One distinction is the elimination of the societal outcome constraint and acknowledgement that leaders may be transformational regardless of whether the results are positive or negative (Bass 1985a). In this view the transformational leader is defined by his/her actions simply as one who motivates followers to do more than they originally expected to do.

The other area of difference is Bass' disagreement with the transformational-transactional continuum view. Bass has repeatedly found that leaders exhibit both transactional and transformational behaviors to varying degrees. Leaders that are more transformational in their actions are simply more satisfying to followers and more effective in terms of the results produced by the groups they lead (Bass 1999). This

result is termed the *augmentation effect*. Augmentation implies transformational leadership's added value, beyond that provided through traditional transactional leadership, can be measured and represents the differential value associated with a transformational leader (Waldman, Bass, and Yammarino 1990). Heightened follower satisfaction occurs because followers interpret transformational leadership behaviors as breaking down the traditional superior-subordinate relationship and replacing it with a more collegial environment (Bass 1999). The increasing respect for the role followers play is fundamental to the success of transformational leadership and highlights the importance of the leader-follower relationship to both leader and organizational success.

“Leadership is not only about leaders, it is also about followers. Leadership is a reciprocal process in that it occurs between people. It is not done by one person to another. Successful leadership depends far more upon the follower's perception of the leader's abilities than upon the leader's own perceptions” (Kouzes and Posner 1990, p. 29).

Transformational leaders act out of their own deeply held personal value systems, and place importance on integrity and justice (Humphreys and Einstein 2003). Burns (1978) referred to these convictions as “end values”, meaning these values could not be negotiated. The belief in the correctness of his/her value set may be a key factor supporting the leader's ability to influence a group. Transformational leaders are effective in creating and articulating a compelling vision of the future of the organization and offering a model consistent with the attainment of that future (Podsakoff et al. 1990; Wang et al. 2005). The vision gives the group something to hold on to, and when aligned with organization and follower goals, provides the basis for followers to extend enthusiastic support and put forth extra effort toward the attainment of the vision (Humphreys and Einstein 2003).

## **Dimensions of Transformational Leadership**

Bass (1985a) conceptualized leadership as defined by the three second order domains of transformational leadership, transactional leadership and laissez-faire, or the absence of leadership. “Bass posits that transformational and transactional leadership are conceptually separate and independent dimensions that appear simultaneously in the behavioral repertoire of leaders” (Tejeda, Scandura, and Pillai 2001, p. 33). Transformational and transactional leadership are further conceptualized as consisting of multiple dimensions. The dimensions extracted through studies undertaken by Bass and colleagues (Avolio, Bass, and Jung 1999; Bass 1985a; Hater and Bass 1988; Howell and Avolio 1993) include four transformational dimensions (idealized influence, inspiration, intellectual stimulation, individualized consideration) and two transactional dimensions (contingent reward, management-by-exception). A seventh dimension (laissez-faire) is actually the absence of leadership and is not considered further in this dissertation. The dimensions and their definitions are summarized in Table 2.4.

Much of the empirical work of Bass and others has been facilitated by the development of the Multifactor Leadership Questionnaire, or MLQ (Bass 1985a), an instrument considered the dominant measurement tool of transformational leadership research (Schriesheim et al. 2006). The MLQ has been consistently updated over the years, and published in multiple forms (Avolio, Bass, and Jung 1999; Bass 1999). The hypothesized factor structure associated with transformational and transactional leadership has been extensively explored using the MLQ.

**Table 2.4: Dimensions of Transformational & Transactional Leadership**

Dimension	Definition
<u>Transformational Leadership Dimensions</u>	
<i>Idealized Influence</i>	Leader serves as a role model by espousing important values, beliefs and a sense of mission (leader behaviors). Follower perceives the leader makes personal sacrifices, effectively deals with crises and exhibits self-confidence (characteristics attributed to the leader by followers).
<i>Inspiration</i>	Leader provides a clear sense of purpose through the articulation of the vision of a desirable future, defines a path for achieving that future, and sets high performance expectations.
<i>Intellectual Stimulation</i>	Leader helps followers become more creative and innovative by getting followers to question accepted methods of solving problems.
<i>Individualized Consideration</i>	Leader pays attention to the unique developmental needs of each follower, mentors followers in the learning process, and provides assignments that stress special follower skills or ensure follower development.
<u>Transactional Leadership Dimensions</u>	
<i>Contingent Reward</i>	Leader clarifies follower behavior and task performance required for a reward to be received.
<i>Management by Exception</i>	Leader monitors follower performance and takes corrective action when the follower fails to achieve established standards (active MBE), or leader waits for problems to arise before taking corrective action (passive MBE).
<u>Laissez-faire</u> - Leader is inactive in relation to follower performance	

*Definitions assimilated from Bass (1985; 1999; Avolio, Bass and Jung (1999); and Tejeda, Scandura and Pillai (2001).*

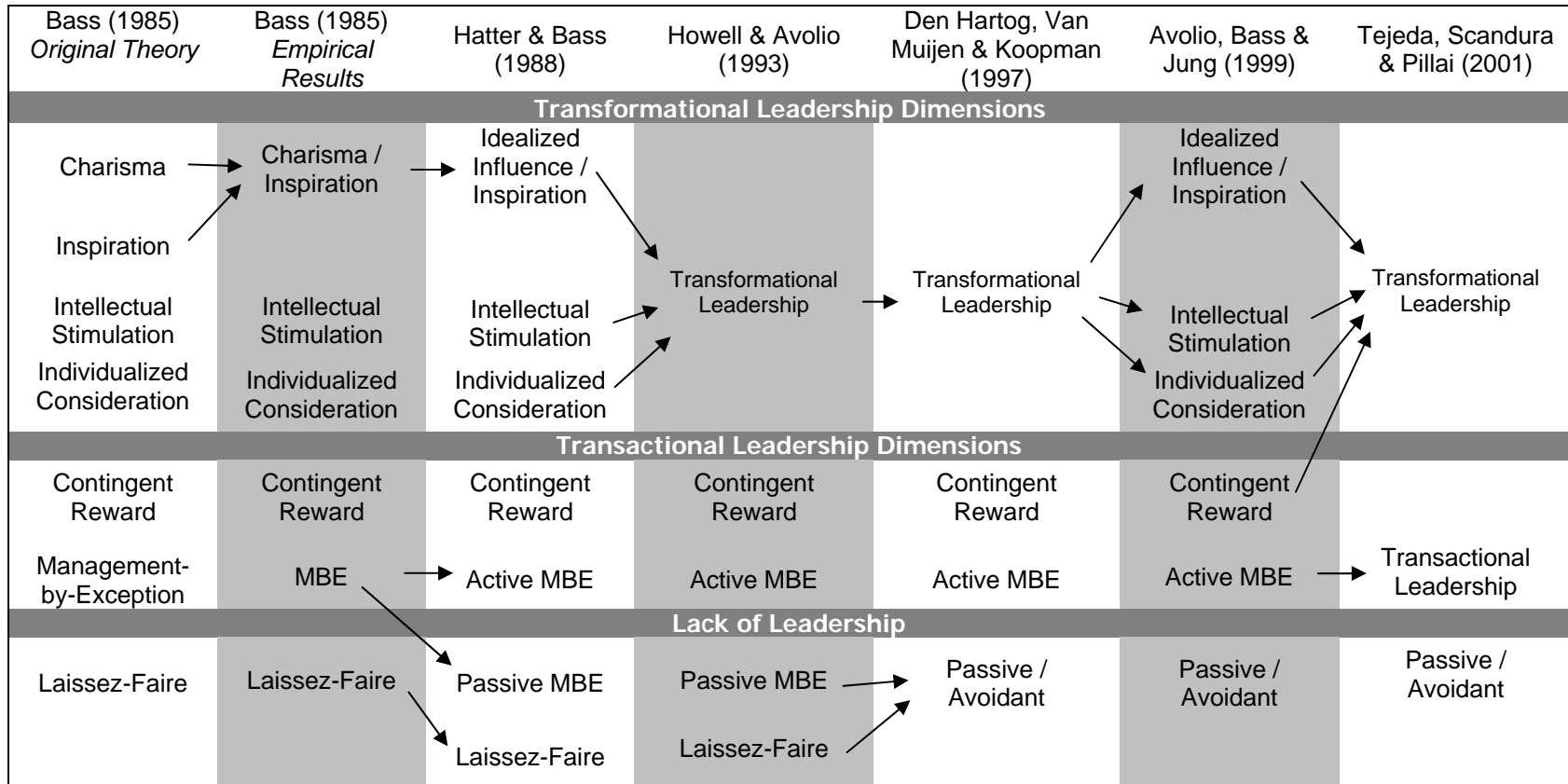
Table 2.5 summarizes a sampling of these studies (Avolio, Bass, and Jung 1999; Bass 1985a; Den Hartog, Muijen, and Koopman 2001; Howell and Avolio 1993; Tejeda, Scandura, and Pillai 2001) and shows the evolution of the transformational-transactional sub-dimensions. While the factor structure has not remained uniform, the second order constructs of transformational, transactional, and passive avoidant leadership are found consistently.

Criticism of the MLQ is rooted in several concerns. The differing factor structures found over time may point out an underlying conceptual weakness in the accepted model of transformational leadership (Yukl 1999). Bass (1985a) argues that the discrepancy in factors is the result of studies utilizing different versions of the MLQ rather than any inherent theoretical deficiency. The transformational scales have consistently reported superior internal consistency results compared to the transactional scales (Tejeda, Scandura, and Pillai 2001), but this may be a result of the high inter-correlations present among the transformational sub-scales (Bycio, Hackett, and Allen 1995). The result has been the occasional collapse of the transformational sub-dimensions into a single factor (Howell and Avolio 1993).

Another problem is poor internal consistency reliability across the complete MLQ scales (Den Hartog, Muijen, and Koopman 2001). Improved reliability has been demonstrated after psychometric refinement has reduced the number of scale items significantly (Tejeda, Scandura, and Pillai 2001). Also, the Idealized Influence sub-dimension has been criticized for mixing both leader behaviors and follower attributions together, and because Bass' definition seems to be based on the leader possessing "mystical" qualities that cannot be precisely measured (Sashkin and Rosenbach 2001).



**Table 2.5: Transformational Leadership Theoretical Factor Structure**



Other conceptualizations of transformational leadership have been developed. Podsakoff and colleagues (MacKenzie, Podsakoff, and Rich 2001; Podsakoff, MacKenzie, and Bommer 1996; Podsakoff et al. 1990) have established a different model of transformational leadership based on findings developed from a separate instrument, the Transformational Leadership Inventory (TLI), which has demonstrated good factor structure, reliability and predictive validity in subsequent studies (Schriesheim et al. 2006). A key difference of TLI-based research from the MLQ-based research stream is found in the originally theorized dimensions of Idealized Influence and Inspiration. These dimensions have routinely combined into a single factor in the Bass' studies (Avolio, Bass, and Jung 1999; Hater and Bass 1988). In a large sample study using the TLI, this factor divided out into four sub-factors: identifying and articulating a vision, providing a model and setting the example, fostering acceptance of group goals, and setting high performance expectations (Podsakoff et al. 1990).

Another well-known model of transformational leadership has been proposed by Kouzes and Posner (1990; 1987). This line of inquiry is based on qualitative feedback from managers asked to describe their "best" leadership experiences. The Kouzes and Posner model identifies five factors, each associated with a distinct leader behavior: challenging the process, inspiring a shared vision, enabling others to act, modeling the way, and encouraging the heart.

Influenced by the work of Bennis and Narus (1985), Sashkin and Burke (1990) developed a model similar to that of Kouzes and Posner, but based upon their own instrument -- the Leader Behavior Questionnaire (LBQ). The five factors found in the Sashkin and Burke model are labeled clarity, communication, consistency, caring, and

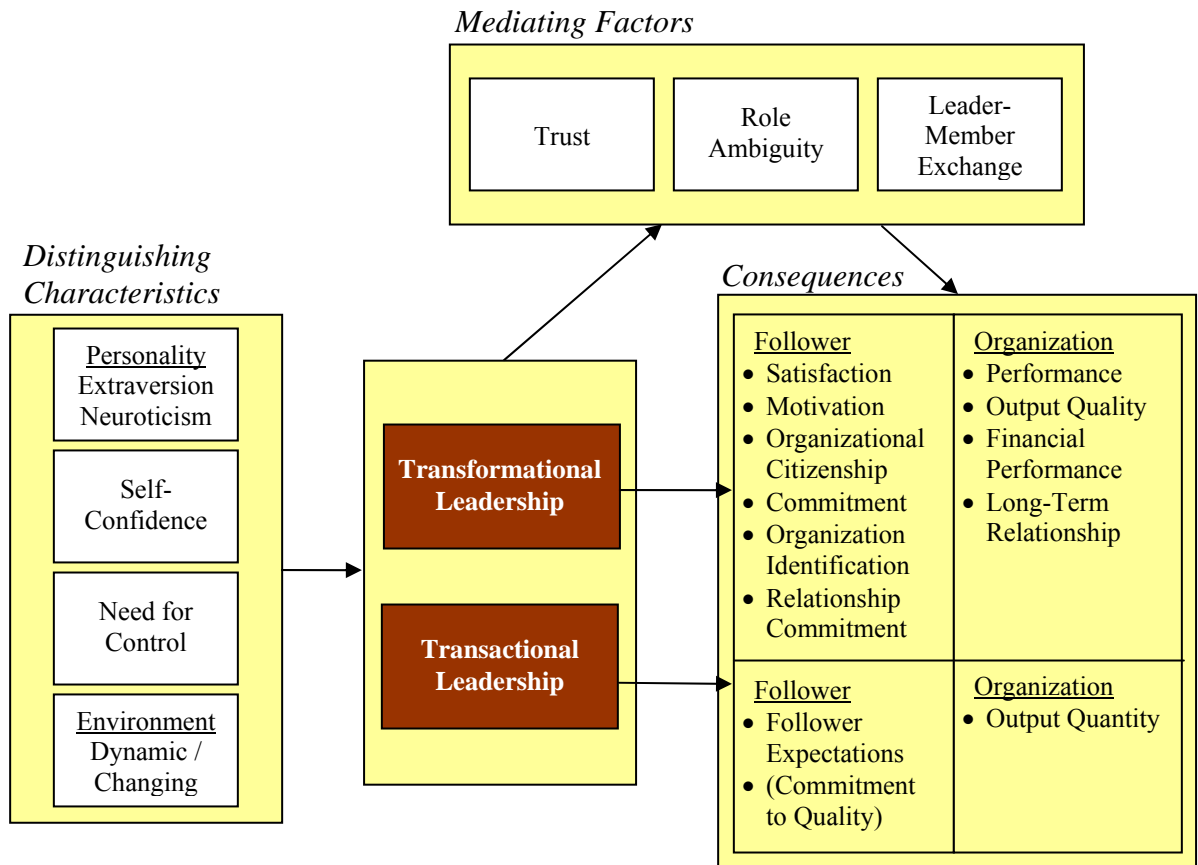
creating opportunities. In addition to the five behavioral factors, three personal characteristics that differentiate effective transformational leaders from transactional leaders are described by the authors: self-confidence, need for moral power, and vision (Sashkin and Rosenbach 2001). The authors do not consider these personal characteristics to be traits, because they can be learned and developed. Many similarities can be found across the models of transformational leadership. Vision, setting an example, and respect for and empowerment of followers are each found across the various conceptualizations. Of the models described, the Bass model has the most extensive research history and is the one carried forward in this dissertation.

### **The Domain of Transformational Leadership**

This section describes the distinguishing characteristics, mediators and consequences of transformational leadership in organizations based on the empirical findings of previous research. The model summarizing these findings is presented in Figure 2.1. Further elaboration on each of the model elements follows.

*Distinguishing Characteristics.* Personality has been extensively studied by researchers seeking to uncover a set of universal traits that can be attributed to an effective leader. The Big Five framework traits of Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism are widely accepted in psychology as core foundational elements of personality (John and Srivastava 1999). Bono and Judge (2004) present a meta-analysis of 26 studies and conclude the association of the Big Five with transformational and transactional leadership is generally weak. However, *Extraversion* (+) and *Neuroticism* (-) have been linked to transformational leadership in several studies.

**Figure 2.1: Transformational Leadership Theoretical Domain**



The positive association of *self-confidence* to leadership has been widely reported, primarily as a trait of effective leaders (Bass 1990). Bass (1985a) describes self-confidence as a requisite ability of charismatic leaders. Similarly, Sashkin and Rosenbach (2001) describe self-efficacy -- the belief that one controls his/her own fate -- as a core personal characteristic transformational leaders must develop to become truly effective. The authors equate self-efficacy to self-confidence, and therefore self-confidence is the term used in this dissertation. Transformational leaders need to exude confidence in their vision in order to convince followers of the need for change (Kouzes and Posner 1987; Podsakoff, MacKenzie, and Bommer 1996; Podsakoff et al. 1990). In addition, a transformational leader, as differentiated from a transactional leader, may use his/her own self-confidence as a means to reinforce the importance of the vision by encouraging followers to take control of their own results. The existence of a vision may separate transformational from transactional leaders.

*Control* presents an interesting paradox. Although leaders exhibiting greater transformational behaviors are deemed to be more effective than transactional leaders (Bass 1999), transformational leaders may actually give up an element of control, thereby allowing followers more freedom to set their own rules. Transactional leaders utilize contingent reward and/or management-by-exception processes to ensure followers perform satisfactorily (Avolio, Waldman, and Einstein 1988; Bass 1985a; Burns 1978; Hollander 1978). The entire exchange relationship is defined by the leader's need for control over follower task outcomes. Transformational leaders guide followers toward acceptance of higher goals and may grant followers more control over task performance. This is consistent with the dimensions of intellectual stimulation (leader chooses to give

up control allowing followers to become more innovative), and individualized consideration (leader places followers in new roles ensuring follower development). Interestingly, the need for control has not been studied.

*Turbulent and uncertain environments* make followers more receptive to transformational leader behaviors because uncertainty creates a collective feeling that action is required to deal with external problems (Waldman and Yammarino 1999). “Within turbulent environments, transformational leadership best motivates organizational members to overcome their resistance to change and adopt new institutional routines” (Vera and Crossan 2004, p. 233). Turbulent environments, characterized by times of crisis, anxiety, and high risk, create a readiness for change in followers (Waldman et al. 2001). Transformational leaders are expected to be more effective in these situations (Vera and Crossan 2004). Conversely, in stable environments, for example when a firm has experienced consistent success in the past, or in mature organizations that follow established procedures and norms, transactional leadership may be a better choice because followers do not perceive the need for change to occur (Vera and Crossan 2004; Waldman et al. 2001).

*Mediators. Trust* is considered among the most important variables mediating the effectiveness of transformational leadership (Podsakoff et al. 1990; Yukl 1998). Transformational leaders motivate followers to perform beyond expectations by earning their trust and respect (Yukl 1989). Trustworthy behaviors such as honesty, integrity and truthfulness are the characteristics followers desire most in leaders (Kouzes and Posner 1987). The desire of followers to be identified with the leader facilitates the growth of trust and commitment in the relationship (Bass 1985b). Trust has been found to be a

mediator between transformational leadership and performance quality (Jung and Avolio 2000), follower satisfaction and group cohesiveness (Hoyt and Blascovich 2003). Trust also mediates citizenship behavior in the transformational leader-follower relationship (MacKenzie, Podsakoff, and Rich 2001; Podsakoff et al. 1990).

*Role ambiguity*, defined as the discrepancy between the amount of information a person has and the amount required to perform the role adequately, has been found to mediate the relationship between transactional leadership and performance (Kohli 1985; Teas, Wacker, and Hughes 1979). Performance expectations and contingent feedback provided by the leader serve to clarify the follower's role and thus reduce ambiguity. A relationship has been found between transformational behaviors and sales performance, when mediated by role clarity of the sales force (MacKenzie, Podsakoff, and Rich 2001).

*LMX* (Dansereau, Graen, and Haga 1975; Graen 1976), is explicit in making the leader-follower relationship the central phenomenon of leadership. Leaders and followers exert a high degree of mutual influence and feel significant obligation via relationship dynamics (House and Aditya 1997). LMX has evolved into a life cycle model including three stages: (1) *low LMX* is a testing phase when leaders and followers evaluate each other's motives and find their role, (2) *medium LMX* may occur once the first stage is complete and involves a better defined exchange relationship built upon established mutual trust, loyalty and respect, and (3) *high LMX* may involve reciprocal influence over an extended period where individual self-interest is transformed into mutual leader-follower commitment toward shared goals (Graen and Uhl-Bien 1995).

Transformational leadership has been posited as creating a culture that enhances leader-follower relationship development and establishing high LMX (Wang et al. 2005).

Low LMX is associated with transactional leadership. Follower development associated with transformational leadership facilitates social bonding between leader and follower. This enhanced relationship then mediates the effects of transformational leadership and follower performance (Dvir et al. 2002). Recent studies have established the mediating relationship of LMX between transformational leadership and task performance (Howell and Hall-Merenda 1999) and citizenship behavior (Wang et al. 2005).

*Consequences.* Past research has found several outcomes consistently related to transformational and/or transactional leadership behaviors. These can be divided between follower-specific results and overall organization performance results. Transformational leadership is widely described as leading to *follower satisfaction* (Bass and Avolio 1994a; Bass, Avolio, and Atwater 1996; Hoyt and Blascovich 2003; Sparks and Schenk 2001). The transformational dimensions of Idealized Influence and Inspiration may enhance satisfaction as followers seek to identify with a charismatic leader. Followers receiving Individualized Consideration from the leader in the form of ongoing mentoring, recognition for a job well done, or constructively phrased criticism may also express their appreciation through greater satisfaction. Transformational leadership serves as a motivational force to get followers to produce the “extra effort” necessary to achieve higher performance as seen through the significant relationship found between transformational leadership and follower *motivation* to complete a task (Hater and Bass 1988; Masi and Cooke 2000; Perry 2000).

A frequently cited outcome is greater *organizational citizenship behavior* (OCB) facilitated by the presence of transformational leadership (MacKenzie, Podsakoff, and Rich 2001; Podsakoff et al. 1990). OCBs are defined as “individual behavior that is



discretionary, not directly or explicitly recognized by the formal reward system, and in the aggregate promotes the effective functioning of the organization” (Organ 1988, p. 4). Podsakoff and colleagues (2000) review the literature and synthesize 30 different forms of citizenship behavior to create the summarized typology of seven OCBs in Table 2.6.

OCBs are behaviors exhibited by followers that are outside the scope of their normal responsibilities -- i.e., extra-role rather than in-role in nature. Leader behaviors, especially supportive behaviors, have been strongly associated with OCBs (MacKenzie, Podsakoff, and Rich 2001; Podsakoff, MacKenzie, and Bommer 1996; Podsakoff et al. 1990). This is an important linkage since a key posited outcome of transformational leadership is the ability of the leader to influence employees to perform at a level exceeding expectations.

Followers may express their desire to support the leader through their attachment, or commitment, to the organization. *Commitment to the organization* is elevated under transformational leadership (Bass 1999; Podsakoff, MacKenzie, and Bommer 1996). The related concept of *organizational identification* has also been found (Epitropaki and Martin 2005). Likewise, in a dyadic study of suppliers and buyers in a supply chain, *relationship commitment* is strengthened by transformational leadership to a greater extent than seen with transactional leadership (Hult et al. 2000). Increased commitment and identification are posited as direct outcomes of transformational leadership due to the increased emotional involvement of followers created by the consistent expression of leader values (Burns 1978; Jung and Avolio 2000)

**Table 2.6: Summary of Organizational Citizenship Behaviors**

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Dimension	Definition
<i>Helping</i>	Voluntarily helping others with, or preventing the occurrence of, work-related problems.
<i>Sportsmanship</i>	A willingness to tolerate the inevitable inconveniences and impositions of work without complaining. Also, the ability to maintain a positive attitude, not take rejection of their ideas personally, and a willingness to sacrifice personal interests for the good of the work group.
<i>Organizational Loyalty</i>	Promoting the organization to outsiders, protecting and defending it against external threats, and remaining committed under adverse conditions.
<i>Organizational Compliance</i>	A person's internalization and acceptance of the organization's rules, regulations, and procedures, which results in a scrupulous adherence to them, even when no one observes or monitors compliance.
<i>Individual Initiative</i>	Engaging in task related behaviors at a level that is so far beyond minimally required or generally expected levels that it takes on a voluntary flavor.
<i>Civic Virtue</i>	A macro-level interest in, or commitment to, the organization as a whole. Such behavior reflects a person's recognition of being part of a larger whole and exhibiting a willingness to participate actively, even at great personal cost.
<i>Self Development</i>	Voluntary behaviors undertaken by employees to improve their knowledge, skills, and abilities.

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Source: Podsakoff, MacKenzie, Paine, and Bachrach (2000)

*Organization performance* is found to be enhanced by transformational leadership when viewed at the team level (Zeffane 1994) or organization-wide (Bass 1990). The *quality of output* has been associated with transformational leadership (Hoyt and Blascovich 2003). Jung and Avolio (2000) conclude performance quality may be enhanced by transformational leadership because leaders using intellectual stimulation encourage followers to think more creatively and longer-term. Bottom-line *financial performance* is enhanced under transformational leadership (Perry and Proctor 2000). The impact of transformational leadership on financial performance is not necessarily a direct one. Financial performance appears to be enhanced as a result of the more direct effect found on the “social psychology” of the workforce through improved motivation, satisfaction, commitment, and OCBs (Perry 2000). Also, *long-term relationship development* is more closely associated with transformational leadership than transactional leadership (Hult et al. 2000).

In general, the findings listed above are described as being more closely associated with transformational leadership than with transactional leadership. While transactional leadership has not been as extensively studied, a few findings are noteworthy. Contingent reinforcement, using such methods as praise, recognition, and pay recommendations for acceptable performance lead to enhanced *follower expectations*, and improved *task performance* (Keller and Szilagyi 1976). Commitment to quality has a negative relationship with transactional leadership (Masi and Cooke 2000), while *quantity of output* is related to transactional leadership behavior (Jung and Avolio 2000; Masi and Cooke 2000).

### *Summary of Transformational Leadership Theory*

Transformational leaders appeal to follower's higher level needs by advocating values and long-term goals intended to generate enthusiastic support through a well-articulated vision (Bass 1985a). Four transformational leadership behaviors have been suggested and extensively tested: idealized influence, inspiration, intellectual stimulation, and individualized consideration. Transformational leadership has been associated with follower satisfaction with the leader, motivation, commitment, and OCBs. At the organization level, transformational leadership enhances team and overall organization performance, output quality, and bottom-line financial performance.

Leaders also exhibit transactional behaviors characterized by contingent reward and management-by-exception (Bass 1985b; Waldman, Bass, and Yammarino 1990), however managers are anticipated to become more effective as they utilize more transformational behaviors (Bass 1999). Transactional leadership demonstrably improves follower role clarity, and task-level performance. At the organization level, output quantity is increased at the expense of quality.

### **FOLLOWERSHIP**

The impact of leadership may be overrated. The preceding discussion of leadership notwithstanding, arguably no more than 20% of organizational success should be attributed to leaders and at least 80% is a result of the contributions of followers (Kelley 1992). Followers represent the bulk of resources available to the organization, and are the group that actually gets things done. "Followership dominates organizations; there are always more followers than leaders" (Dixon and Westbrook 2003, p. 20).

This section outlines and explains the concept of followership along three lines. First, effective followers are differentiated from the traditional, negative perception of the passive follower. The positive view of followership is a critical foundation necessary for later theory development. Second, once the concept has been fully developed, a definition of followership is presented. A clear definition has not been provided in the literature to date. Third, the dimensions of followership are identified and a model of followership is created to describe the domain of the concept.

### **The Importance of Followership**

The concept of followership has not generated the same interest found in the study of leadership. This imbalance exists despite the fact that leadership and followership are two sides of the same process (Chaleff 1995), and great performances are needed from both roles if an organization is to succeed (Kelley 1992). Although much has been written about the value provided by leaders, very little has been written about followers (Lundin and Lancaster 1990):

“If you scroll through the subject catalogue at the Library of Congress you will find the category ‘leadership’ and hundreds of books on the subject. You will not find a category ‘followership’ and you will only find a handful of articles and a book or two on the subject, tucked away under the leadership rubric. This is curious as there are many more followers in the world than there are leaders. Improving their performance would seem equally worthy of study as improving the performance of leaders” (Chaleff 1995, from Preface page xii).

The emphasis placed on leadership confirms the generally held belief that leadership is important to organizational success. Unfortunately the lack of significance granted followership suggests followers are held in lower regard. The less vital role

given to followers in much of the literature is confusing when one considers that almost everyone assumes both leader and follower roles at times (Chaleff 1995; Kelley 1992).

“Without followers, there are plainly no leaders or leadership” (Hollander 1993, p. 29). Leaders strive to influence the behavior of followers (Dvir et al. 2002), but followers determine the acceptance and effectiveness of the leader (Kelley 1992). Leader actions may create either alienated or committed followers (Banutu-Gomez 2004). Follower influence over leader success may not be easily identified. High performing followers may simply stop performing beyond expectations -- they may make quota rather than exceed it, marginally miss quality specifications, or fail to train junior team members as quickly as necessary. As a result, the leader’s status is tarnished and his/her ability to create exceptional results may be called into question.

#### *Overcoming Negative Perceptions of Followership*

Older theories of leadership assume followers require significant guidance to produce results and are incapable of making an independent contribution. “Being a follower has a negative connotation because it is usually used to refer to someone who must be constantly told what to do” (Banutu-Gomez 2004, p. 143). This negative view of followership conjures up images of docile, conforming, weak, “yes” men; losers that can’t make the grade as leaders, and thus fail to excel (Chaleff 1995; Kelley 1992). Leadership in this context is assumed as a unidirectional model of what a leader does to a subordinate (Yukl and Fleet 1992), and the role of followers is based on their perceived susceptibility to the leader’s behaviors and style (Howell and Shamir 2005).

The advent of transformational leadership, LMX and OCB theories has helped elevate the importance of followers to organizational success. Transformational leadership assumes successful leaders must consider followers' values and goals to create a shared view of the future. LMX places leaders and followers in a co-influencing relationship context. OCB suggests followers exhibit behaviors that benefit the group rather than just themselves. Together these theories provide a lens to view leadership and followership as dual roles that both contribute to organizational success.

### *What is Followership?*

Followers are not the antithesis of leaders (Kelley 1992). Followers are important to organization success, and effective followers collaborate with leaders to achieve performance goals. Effective followers assume control over their own actions and strive to achieve both personal and organizational goals (Chaleff 1995; Kelley 1992). An individual often cannot assume a leadership role until proving themselves to be a good follower (Litzinger and Schaefer 1982). Former US representative Sam Rayburn said "You cannot be a leader and ask other people to follow you unless you know how to follow, too" (from Dixon and Westbrook 2003, p. 20). Yet, leadership may not be the ultimate goal for many. Effective followers may prefer to remain in a follower role rather than assume a leadership position (Kelley 1992; Potter, Rosenbach, and Pittman 2001).

Unfortunately, no author clearly defines followership. A generalized definition of followers and followership is needed to define the boundaries of the concept and allow for further analysis. Howell and Shamir (2005, pps. 98-99) define a follower as "a person who acknowledges the focal leader as a continuing source of guidance and inspiration,

regardless of whether there is any formal reporting relationship”. Followers may seek leaders outside their own immediate area of the organization. The Howell and Shamir definition has the benefit of differentiating followers from subordinates.

Other criteria essential to the definition of followership have been suggested. Effective followers have been characterized as *working cooperatively* with leaders to attain shared goals (Kelley 1992), *partnering* with leaders to ensure organizational success (Potter, Rosenbach, and Pittman 2001), *challenging* leaders when their behavior is deemed inappropriate (Chaleff 1995), and *acting with integrity* based on their own set of beliefs (Lundin and Lancaster 1990). Kelley (1992) considers followership and leadership to be “complementary”, “symbiotic”, “interdependent” and “dialectic”. Chaleff (1995, p.2) states, “leaders and followers form an action circle around a common purpose”.

Building upon the Howell and Shamir definition of followers and the preceding discussion the proposed definition used in this dissertation is:

*Followership is a relational concept involving a leader and follower in which the follower exhibits proactive individual behavior created out of follower integrity, intelligence and enthusiasm to help the organization achieve its goals. The follower chooses to work toward leader-defined goals so long as they align with organization objectives. When leader goals diverge the follower takes the initiative to challenge the leader and attempt to re-align leader-directed actions with organizational interests.*

### **Dimensions of Followership**

Contrasted with the thousands of studies found on a variety of leadership topics, almost no empirical followership research has been produced. One known scholarly study finds followership is a measurable concept, individuals exhibiting followership



behaviors can be identified within organizations, and followership can be found at all levels in organizations (Dixon and Westbrook 2003). Still, much more research is needed to accurately describe followership and its effects on organization performance.

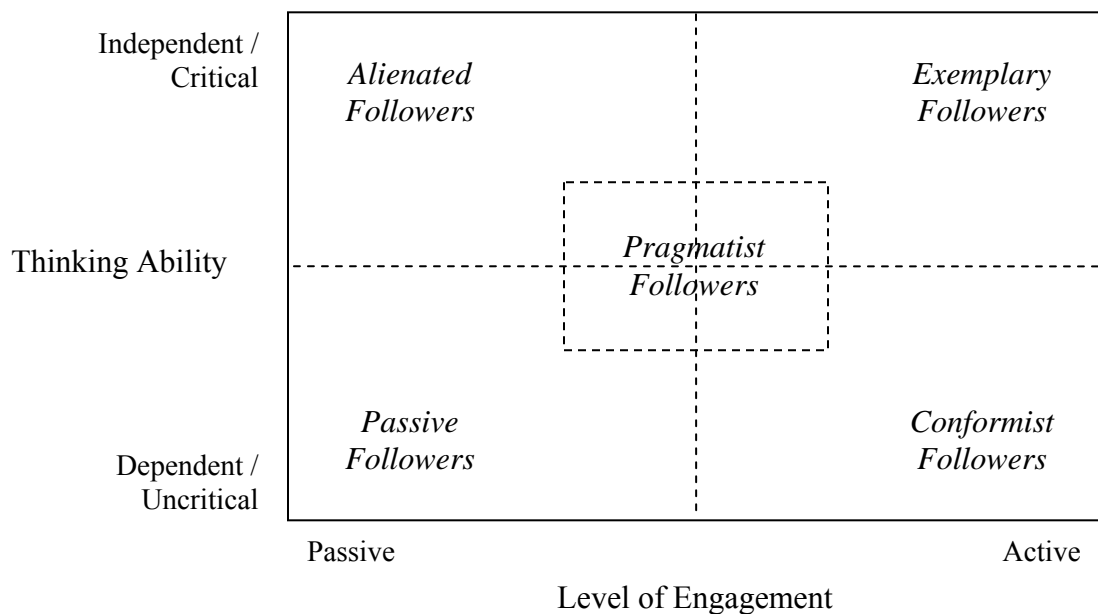
Two conceptual models of followership have been proposed in the literature. As shown in Figure 2.2, Kelley (1992) develops a classification scheme that locates followership style in a space defined by the two dimensions of independent, critical thinking and active engagement. The best followers are a combination of independent, critical thinkers (individuals who can think for themselves, give constructive criticism, and are innovative and creative) and are actively engaged (individuals that take initiative, assume ownership, participate actively, and go above and beyond the requirements of the job). Individuals possessing these characteristics are described as *exemplary followers*. The reverse are identified as *passive followers* that do not demonstrate independent, critical thinking abilities and are not actively engaged. This category of follower is closely associated with the old, negative connotation of follower. *Alienated followers* may have once been exemplary, but are no longer actively engaged. *Conformist followers* demonstrate a desire to engage with the leader, but fall short on the ability to think independently, possibly as a result of working for a domineering leader. Finally, *pragmatist followers* may possess the ability to be exemplary, but fail to fully commit.

In a similar vein, Potter, Rosenbach and Pittman (2001) identify follower types in a two-dimensional space defined by relationship orientation and performance orientation as shown in Figure 2.3. Individuals grading high on the relationship dimension identify with the leader's vision, demonstrate trustworthiness through their behaviors, and communicate honestly with the leader. Individuals grading high on the performance

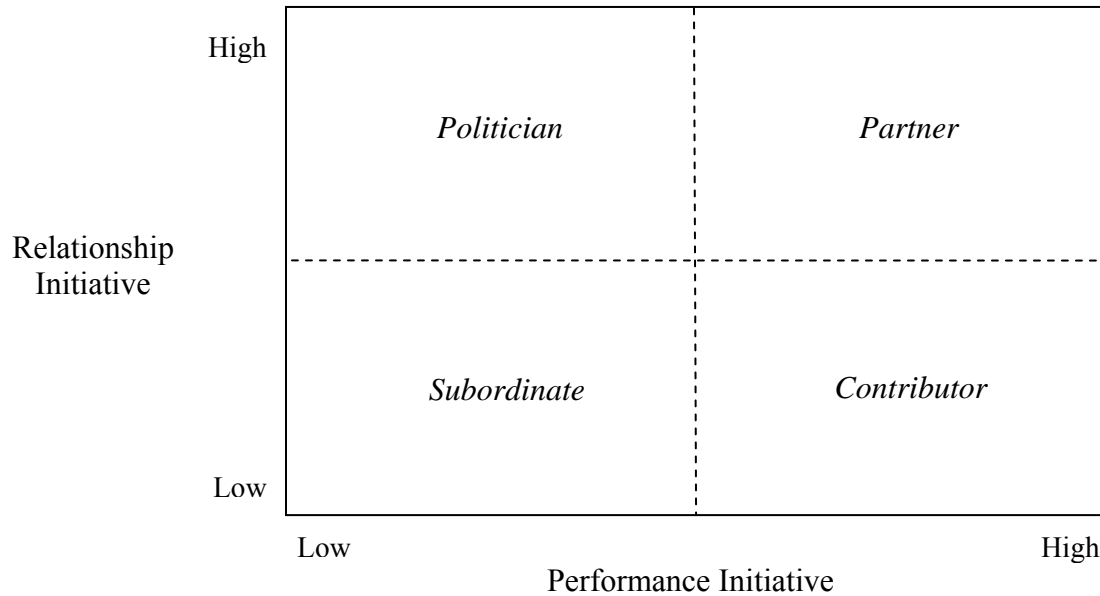
dimension hold personal performance standards that are higher than those required by the job, cooperate effectively in peer working relationships, take on leadership roles as needed, and embrace change by looking for new and better ways to accomplish tasks.

As with Kelley’s framework, the best followers are found in the upper, right-most cell. The authors label these followers *partners*, and this follower style relates to the leader on equal footing, and may be populated by individuals that are leaders-in-waiting. *Subordinates* rate low on both dimensions, and as in the Kelley model this is the group that most closely resembles the negative view of followers. *Politicians* risk over-emphasizing relationship development without a balancing drive for high performance. *Contributors* are focused on performance, but demonstrate little interest in developing stronger working relationships.

**Figure 2.2: Kelley’s Model of Followership**



**Figure 2.3: Potter et al's Model of Followership**

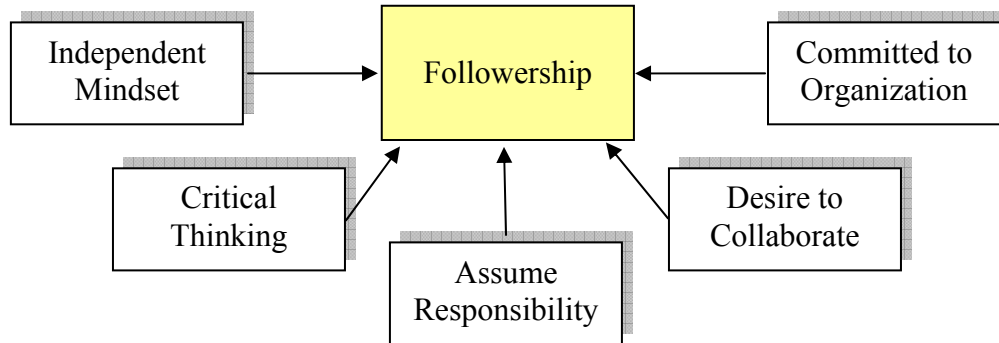


The available models, while useful, are actually simple classification tools, and may be more effective at assigning followers to a category than for predicting follower behavior. Two models of followership are developed in this dissertation. First, Figure 2.4 presents the dimensions of followership proposed to create a formative followership construct. Second, a conceptual model of followership is created utilizing the dimensional construct and previously introduced transformational leadership theory.

Effective followers must possess an *independent mindset*. Kelley (1992) calls this the courageous conscience. Effective followers maintain the importance of their personal value set. They may be influenced by leaders, but cannot be convinced to take on new values that are in conflict with their own beliefs. Independence allows the follower to act with integrity (Lundin and Lancaster 1990), and to take an ethical stand when necessary (Kelley 1992). Followers with this characteristic are not intimidated by organizational

**Figure 2.4: Followership Dimensions**

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hierarchy or an authoritative role assumed by the leader. Less effective followers may lose sight of their own closely held beliefs and choose to mirror the values passed down from the leader without a filter of independence. Because a personal filter is lacking, these followers may act without regard to past commitments, and may take actions that are not in the best interest of the organization. Such followers will continue to complete assigned tasks and accomplish stated goals, and therefore their behavior is classified as passive, or transactional.

A key characteristic that differentiates effective followers from passive, less effective followers is knowing what to do without being told. This ability is facilitated by *critical thinking* behavior (Kelley 1992). This ability may be manifested in several ways including routinely looking for better ways accomplish a task, providing constructive criticism as a way of developing peers and subordinates, and designing creative solutions to unforeseen problems (Banutu-Gomez 2004). Effective followers actively participate

in organizational transformation (Chaleff 1995), and champion new ideas when necessary (Banutu-Gomez 2004). Passive followers require closer supervision and rely on the leader to provide direction, especially for newly assigned tasks. Such followers strive to accomplish tasks more efficiently over time by developing an expertise in the accepted process. Less effective followers do not go out of their way to provide feedback to peers, and prefer the status quo when faced with a potential change.

Effective followers *assume responsibility* for their actions and performance results (Chaleff 1995). They make sound decisions that benefit the organization (Lundin and Lancaster 1990). Effective followers demonstrate a high competence with in-role tasks (Podsakoff et al. 1990). Once in-role performance is established, effective followers take on extra-role activities (Podsakoff et al. 2000; Podsakoff et al. 1990). This may involve off-loading work from the leader, or picking up a task that has been set aside because of lack of resources. Extra-role performance is an example of the effective follower going above and beyond what is required for the good of the organization (Banutu-Gomez 2004). Less effective followers may struggle to complete assigned tasks effectively and never find the capacity to take on additional outside responsibilities.

Effective followers *desire to collaborate* with leaders and others throughout the organization. They develop a network of relationships to ensure they can bring the necessary skills to bear on a problem when their own expertise is limited (Kelley 1992). They are team players willing to help others if it benefits the organization. Effective followers work cooperatively with the leader to accomplish mutually held goals. Passive followers do not develop relationships outside of their normal circles, and may struggle to

find the appropriate skills when new problems occur. Their dealings with the leader are more likely to be directed by the leader rather than collaborative.

Demonstrating *commitment to the organization* (Banutu-Gomez 2004; Lundin and Lancaster 1990) is the final dimension of followership. Commitment is established through creating a shared purpose with the leader (Chaleff 1995). This purpose could be achievement of the goals associated with the leader's vision (Kouzes and Posner 1987). Effective followers may demonstrate their commitment to the organization by challenging the leader's direction when it strays from mutually-held goals (Chaleff 1995). Passive followers do not display a significant commitment to the organization, and focus instead on completing assigned tasks. These followers will not disagree with the leader unless the decision has a direct impact on the follower's welfare.

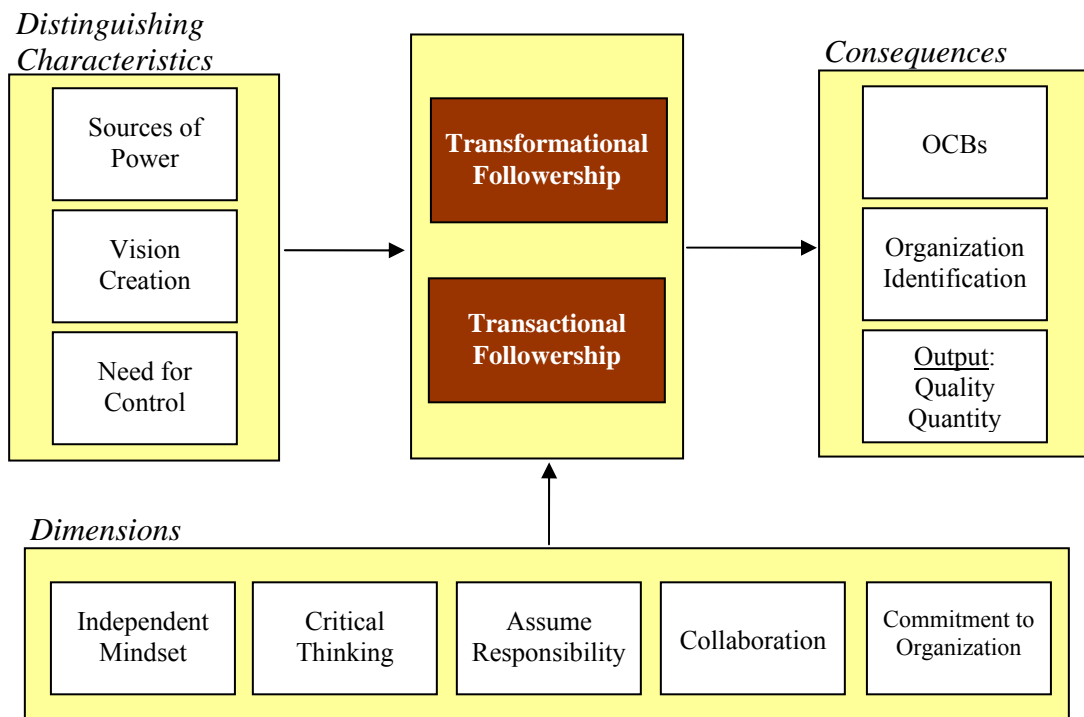
### **A Theory of Followership**

The dimensions of followership characterize follower types as falling on a continuum between enthusiastically engaged, highly effective followers at one end and passive, less effective followers at the other. This places the concept of followership squarely within the transformational leadership paradigm. A transformational follower is an individual grading highly on the five followership dimensions, and is ready to be a catalyst for change in the best interests of the organization. A transactional follower generates low scores on the dimensions suggesting the follower is unwilling to accept the changes associated with transformation and is not interested in performing beyond his/her own job description. Transformational followers team with a transformational leader to

drive change and achieve greater performance results. Figure 2.5 presents the proposed model of transformational followership.

When leaders encounter energized, transformational followers they will find their vision of a better future to be readily accepted and possibly even improved upon. In this situation, leaders should prefer to deal with followers on a transformational level because the potential to achieve greater results exists. When leaders deal with passive followers that require more direct supervision they naturally fall into a transactional leadership style. Thus, transformational followers should be able to be distinguished from transactional followers based upon classification of their behaviors across each of the five dimensions of followership.

**Figure 2.5: Transformational Followership Theoretical Model**



*Distinguishing Characteristics.* Before it is appropriate to evaluate an individual on the five followership dimensions, a common set of criteria is needed to differentiate leaders from followers. Three characteristics are posited based upon leadership concepts presented previously. It is posited that leaders and followers may be distinguished on the basis of one or more of these elements. These characteristics are introduced and described here to explain the concept of followership, but are outside the scope of this dissertation and will not be carried forward into the theoretical model presented later.

*Power* sources have been widely described as a key characteristic used to identify the leader (Emerson 1962; French and Raven 1959; Gaski 1984; Hollander 1993). Power may distinguish leaders from followers in three ways. First, followers may not have access to a significant source of power. They generally lack positional, or legitimate, power for example. Second, followers may choose to defer using power they do possess. In some cases followers may possess critical information about a process, but prefer to share the information for the benefit of the organization rather than hoard the information in a quest for greater status or a leadership role. Because the information is proactively shared with others, no information power exists. Third, the power source possessed by the follower may simply be relatively smaller than the leader's power source.

Leaders are given the responsibility to create and articulate a *vision* for the future. Followers may provide input that is used to develop an evolved vision, but the creation of the vision is central to the leader's role. The actual existence of a vision is associated with the transformational paradigm. When a vision is absent leaders and followers are not working toward a mutually agreed upon long-term goal and arguably both leadership and followership should tend to become more transactional.



Finally, leaders may exhibit a stronger *need for control* than those that choose to follow. By definition, followers are willing to give up a portion of control to the leader and can therefore be clearly distinguished on this element. Followers may possess personal values that lead them to eschew personal esteem while certain leaders strive to achieve their place in the spotlight.

*Consequences.* The scarcity of previous empirical research identifying the outcomes of followership necessitates extrapolation from relevant findings in the leadership literature. Several areas investigated in a leadership context appear to have direct application to a model of followership. These are discussed next.

*OCBs* (Podsakoff, MacKenzie, and Bommer 1996; Podsakoff et al. 2000; Podsakoff et al. 1990) are discretionary behaviors (Organ 1988) undertaken because the follower desires to go above and beyond job requirements to ensure the organization achieves its goals. OCBs may occur because the follower agrees with the vision articulated by the leader (Podsakoff et al. 1990), or because the follower sees an opportunity to impact the organization's success and chooses to act. OCB's are anticipated to be more closely associated with transformational followers because these behaviors are extra-role in their nature and therefore require effort beyond the assigned job role (Podsakoff et al. 2000). Followers that fail to exhibit significant OCBs, and attempt to maximize in-role performance should be considered transactional followers.

*Organizational identification* is "the perception of belongingness or 'oneness' with an organization" (Epitropaki and Martin 2005, p. 570). Followers identify with the organization and actually assume organizational values and core characteristics as part of their own self-concept (Mael and Tetrick 1992). While both transformational and

transactional followers may identify closely with their organization, transformational followers may project stronger identification because they identify with the organization of the future that will result from an envisioned change process. Transactional followers' identification may be reduced in a transformational environment as the evolving organization takes on different characteristics from the pre-transformed organization.

Followers have been shown to influence organizational performance outcomes in leadership research as a result of leadership style (Hoyt and Blascovich 2003; Masi and Cooke 2000; Perry 2000). Because followers represent the bulk of the organization and are primarily responsible for actually completing the work (Dixon and Westbrook 2003), similar outcomes may be anticipated based on followership style. Therefore, *quality of output* is posited as a consequence of transformational followership, and *output quantity* should be more closely related with transactional followership.

### *Summary of Followership*

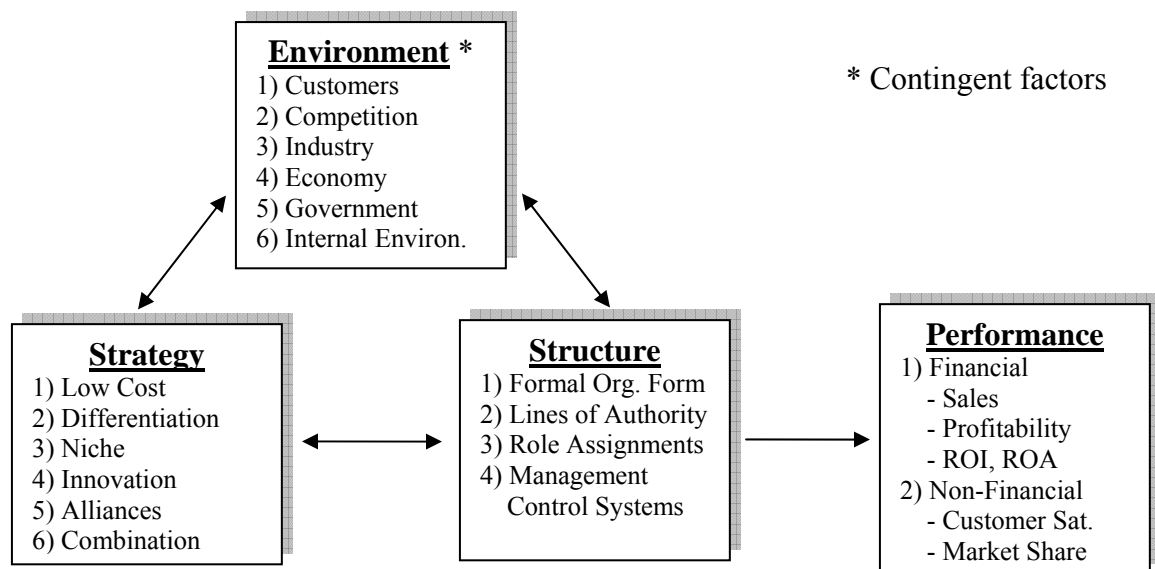
Although recent leadership theory development has placed greater emphasis on the role of followers, almost no empirical evidence is available to explain the contributions followers make to their organizations. Effective, transformational followers that produce extra effort because of their commitment to the organization are different from the traditionally held view of passive, transactional followers. Five dimensions distinguish transformational followers from transactional followers: independent mindset, critical thinking, assuming responsibility, collaboration, and commitment to the organization. A conceptual framework of followership based on the transformational leadership paradigm has been presented with transformational followers

posited to exhibit more OCBs, identify more strongly with the organization, and strive for greater quality of output. Transactional followers are expected to demonstrate fewer OCBs, identify less strongly with the organization, and focus on output quantity.

## STRATEGY, STRUCTURE AND PERFORMANCE

One of the richest research paradigms in the strategic management literature is based on SSP theory (Galunic and Eisenhardt 1994). SSP suggests a firm's performance can be predicted from the degree of alignment between its strategy and the structural elements developed to support the strategy (Galbraith and Kazanjian 1986; Rumelt 1974). The appropriateness, or fit, of the strategy-structure alignment is mediated by environmental factors facing the organization. This contingent SSP framework (Miles and Snow 1978; Miller 1988) is reproduced in Figure 2.6 and described in this section.

**Figure 2.6: Model of the SSP Paradigm**



Source: adapted from Defee and Stank (2005)

Businesses use strategy to create and sustain a competitive advantage (Day, Weitz, and Wensley 1990). Strategy is defined as “*the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals*” (Chandler 1962, p. 13). Porter’s (1980) conceptualization of low cost, differentiation, and niche market strategies is perhaps the most widely used framework of strategic options available to the firm. Other options have been suggested including technology standardization and innovation (Galunic and Eisenhardt 1994) and business network alliances (Varadarajan and Jayachandran 1999). In addition, Bartlett and Ghoshal (1991) note that firms routinely combine multiple strategies.

Structure is “*the design of organization through which the enterprise is administered*” (Chandler 1962). Structure provides the means for accomplishing the organization’s stated strategic goals. Several elements of structure have been suggested in the literature including those listed in Figure 2.6. Formal organizational form is the hierarchy present in the organization and is frequently described in terms of the degree of centralization, formalization and specialization found in core business routines (Dalton et al. 1980). Lines of authority are identified by the relationship between managers and subordinates, and across offices and departments (Chandler 1962). Role assignments describe the responsibility of each position found in the organization (Galbraith and Nathanson 1978). Management control systems include coordination techniques (Rumelt 1974), hiring and firing policies (Dalton et al. 1980), and methods of administering rewards and punishments (Miles and Snow 1978).

SSP theory grew out of a study intended to explain the growth patterns experienced by the largest U.S. companies prior to the mid-20<sup>th</sup> century (Chandler 1962). Four firms were investigated in detail: du Pont, General Motors, Standard Oil of New Jersey, and Sears, Roebuck and Company. This research determined an organization's structure can be predicted as a result of the strategy pursued by the firm. Chandler found that as the firms implemented a product diversification strategy, a divisional organization structure evolved to manage the greater complexity. The strategy-structure linkage has been consistently replicated by researchers examining European (Channon 1973; Dyas and Thanheiser 1976; Pavan 1972) and multinational corporations (Egelhoff 1982; 1988; Franko 1976; Stopford and Wells 1972).

Rumelt (1974) built on the theory and added the critical link to performance in an extensive review of over 200 large U.S. corporations. An important finding is that certain strategy-structure combinations consistently produce better performance results. For example, firms diversifying into a related field showed greater performance than firms attempting to grow into unrelated fields. This expanded strategy-structure-performance theory has been replicated by research into multinational corporations (Armour and Teece 1978; Hoskisson 1987; Teece 1981; Williamson 1975) and using stock market returns as a performance measure (Lubatkin and Rogers 1989).

Later research augmented SSP to incorporate the influence of environmental factors outside the control of the focal organization. A series of studies sampling U.S., Canadian, and Australian firms considers the strategy-structure relationship in the context of environmental conditions (Miller 1988; 1987a; 1987b). The results suggest certain strategy and structure combinations are often found in similar environments. This is in

line with the structure-conduct-performance framework from industrial organization economics which posits environmental factors are the primary cause of firm performance (Porter 1985; 1980). Miles and Snow (1978) assess four industries and conclude a firm's strategy, structure and processes must adapt to the environment confronting the organization. *External environmental factors* affecting organization performance include changing customer requirements, the intensity of competition, industry and market characteristics, the state of the economy, and the presence of governmental regulations (Christensen and Montgomery 1981; Porter 1985; Ulrich and Ellison 1999). Factors inside the firm, such as culture and existing capabilities, also influence SSP outcomes.

The most appropriate strategy and structure is dependent on the situational context presented by the environmental factors facing the organization (Galbraith and Kazanjian 1986; Galbraith and Nathanson 1978; Miles and Snow 1984; 1978). Performance results from the degree of *fit* between strategy and structure taken within the context of current internal and external environmental factors. A minimal level of fit among these factors is necessary for survival of the firm (Miles and Snow 1984). Performance may be affected in the short run for even the most capable firms when changing environmental conditions force the firm to develop new, more evolved strategies (Hunt and Morgan 1995). Existing structure may limit a firm's plans to change strategy. Structure takes time to modify and therefore may constrain the strategic options available to the firm in the short run (Hall and Saias 1980).

### **SSP in Supply Chains**

Supply chains have become increasingly important to the success of organizations as competition has evolved beyond individual firms toward networks of firms (Cooper,

Lambert, and Pagh 1997). The inter-organizational unit of analysis of supply chains has prompted several authors to suggest SSP as an appropriate theoretical lens through which to view supply chain phenomena (Bowersox, Closs, and Stank 1999; Chow, Henrikssen, and Heaver 1995; Defee and Stank 2005; Rodrigues, Stank, and Lynch 2004; Stank, Davis, and Fugate 2005; Stank and Traichal 1998; Stock, Greis, and Kasarda 1999).

The underlying premises of SSP must be extended across multiple organization borders to be meaningful in a supply chain context (Chow, Henrikssen, and Heaver 1995). Supply chain SSP is more complex than traditional SSP. Inter-organizational structure and performance are not well understood concepts. Contingent factors may not affect each supply chain member consistently. For example, competition may vary greatly between echelons in the supply chain. Globalization pressures have created a sea change with new, low cost competitors for upstream supplier and manufacturing organizations that did not exist a decade ago (Adler 2004; Shister 2006). The growth of the internet as a selling outlet has impacted all echelons across the supply chain; the increased competitive affect has been disproportional on wholesalers and retailers.

### **Supply Chain Structure**

A central theme of supply chain research has been the importance of integration within the firm and between supply chain members (Bowersox, Closs, and Stank 1999; Kahn and Mentzer 1996; Robertson, Gibson, and Flanagan 2002; Stank, Keller, and Closs 2001). Without tight integration, process coordination is impossible and the result is failure of supply chain operations (Chow, Henrikssen, and Heaver 1995; Mollenkopf, Gibson, and Ozanne 2000; Williams et al. 1997). Supply chain structure, defined as “*the*

*network of members and the links between members of the supply chain*” (Lambert, Cooper, and Pagh 1998, p. 4), is the mechanism through which integration occurs. Several descriptions of supply chain structure have been offered in the literature.

Chow, Henrikssen, and Heaver (1995) identify five dimensions of structure taken from the management science literature. Supply chain *formalization* is the degree to which norms governing transactions between organizations are made explicit. Supply chain *intensity* is the level of resource investment that an organization has in its relationship with another organization. Supply chain *frequency* is the amount of contact between the organizations. Supply chain *standardization* is the degree of similarity in the resources or procedures used. Supply chain *reciprocity* is the degree of symmetry in the relationship. The authors suggest these structural dimensions should be examined in the context of five contingency variables: strategy, environmental uncertainty, environmental heterogeneity, the importance of logistics, and information technology. The article is primarily definitional and is among the first to connect SSP and supply chains, but no theoretical model is offered.

Stank and Traichal (1998) apply SSP to a firm’s logistics operations in a survey of maquiladora managers. The proposed model empirically tests the relationship between a firm’s logistics strategy, logistics organizational design dimensions, and logistics performance. Three structural variables are considered as essential elements of internal logistics integration: *centralization* of decision-making authority, *formalization* of rules and procedures, and *specialization* of tasks across organizational units. Firm size and complexity are used to establish a contingent SSP framework. The authors conclude organizational structure does affect performance when moderated by the degree of



integration. This study provides a practical application of SSP in a single-firm logistics context, but falls short of providing empirical results across a multi-echelon supply chain.

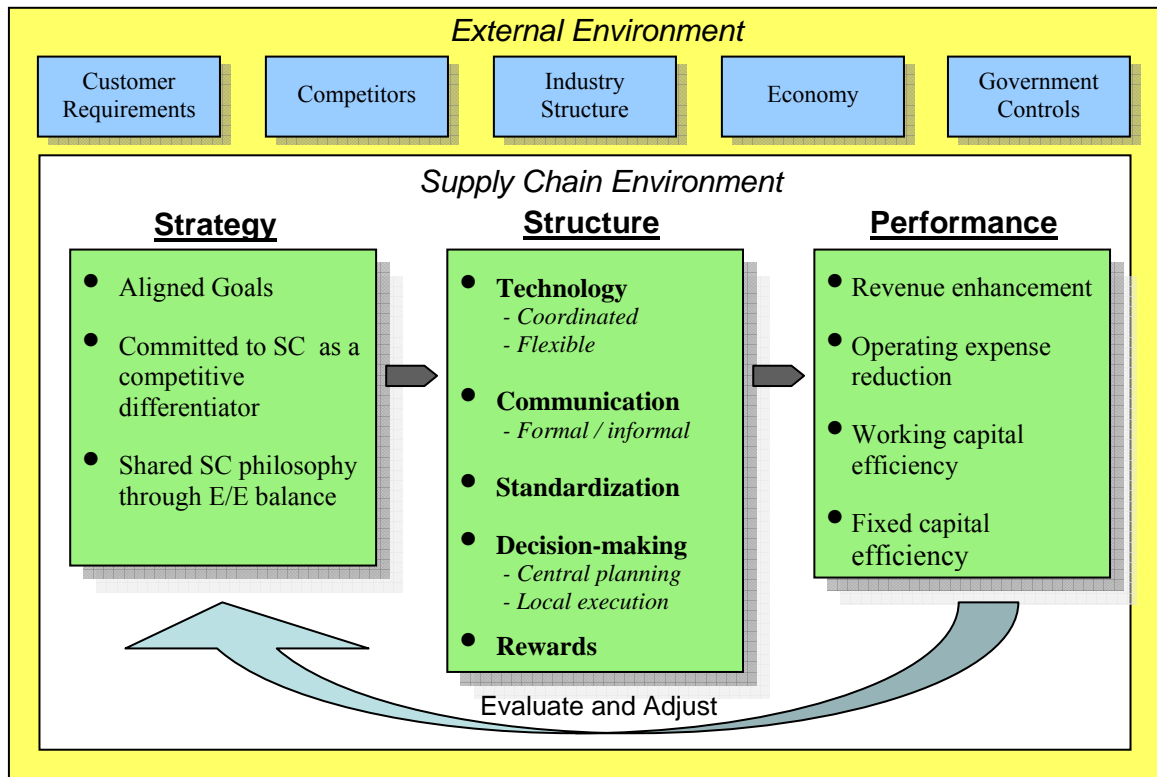
Stock, Greis, and Kasarda (1999) apply SSP in the expanded context of enterprise logistics integration. The authors view the competitive environment faced by the firm as the primary contingent factor influencing the firm's ultimate strategy and structure. Enterprise logistics integration takes other supply chain organizations into consideration, with structure represented through the network of firms. Dimensions of structure proposed are the degree of *vertical integration* found in the focal logistics firm, *flexibility* to react to changing circumstances, and *cooperation* found between firms. The vertical integration and flexibility dimensions are internal to the firm. Cooperation incorporates inter-organizational relationship dynamics such as control, information exchange, interdependence, time horizon, goal consistency, and formality. The article is conceptual rather than empirical. The authors take a step closer to developing an actual supply chain SSP model, however the unit of analysis proposed remains the focal firm rather than multiple firms across a supply chain.

Rodrigues, Stank, and Lynch (2004) use *information systems* and *measurement systems* to express structure in their recent study. The model proposed by the authors suggests these structural elements drive internal (within the firm) and external (across multiple firms) integration. The authors find a more significant result occurs by combining integration into a single mediating factor that leads to improved performance. The study provides an important empirical test of SSP in the supply chain environment. The unit of analysis remains at the focal firm level, as with prior studies.

Stank, Davis, and Fugate (2005) develop a strategic logistics framework combining SSP and the RBV. The authors propose firms with a supply chain orientation, i.e., firms that view the supply chain as a source of strategic competitive advantage (Mentzer 2001), will seek tighter integration in order to effectively implement SCM. *Logistics capabilities* are suggested as a surrogate for structure in a supply chain logistics context. Five logistics capabilities are identified, including customer focus, time management, integration, information exchange, and evaluation. Considering capabilities as structure is consistent with the conclusions of Stank and Traichal (1998) concerning positioning and integration capabilities (Bowersox 1995). This study makes an interesting connection between SSP, the RBV, and the supply chain environment, but does not provide empirical support for the propositions.

Defee and Stank (2005) review the SSP literature and propose five structural elements and five external contingency factors necessary to develop a complete supply chain SSP theoretical model as shown in Figure 2.7. Structural dimensions proposed include information integration, communications, standardization, decision-making authority and rewards. External environmental factors proposed include customer requirements, competitors, industry structure, the economy, and government controls. Supply chain strategy is represented in the model as requiring shared goals, a shared supply chain orientation, and a shared view of successful performance based upon a common view of efficiency and effectiveness. Supply chain strategy is replaced in this dissertation by supply chain leadership style. Performance goals should be aligned with strategic goals and then measured. Structure and external environmental factors are described next. Performance is covered in the following section.

**Figure 2.7: Supply Chain SSP Framework**



Source: adapted from Defee and Stank (2005)

The structural dimensions are expected to influence performance across the entire supply chain. *Technology integration* is described by the degree of coordination across supply chain members and the flexibility of systems to change without damaging the linkages between members. A related view found in the logistics literature is *information availability* (Fawcett, Stanley, and Smith 1997). The availability and sharing of information is a significant factor contributing to the success of supply chains (Mentzer 2004), and therefore this is the view adopted in this dissertation. *Communication* is classified as formal and informal, both of which are necessary to ensure desired performance outcomes. *Standardization* applies to how information is organized and

shared across members. *Decision making authority* differentiates centralized planning activities that are the responsibility of the supply chain leader from decentralized implementation activities that fall to member organizations. *Rewards* deal with the two objectives of motivating boundary-spanning employees and organizations to achieve holistic supply chain performance goals.

Environmental factors provide the context for supply chain strategy-structure development. Changing *customer requirements* influence supply chain operations directly because they often impact the definition of successful performance. *Competitors* may develop new capabilities that erode the supply chain's competitive advantage. *Industry structure* may constrain the strategy-structure combinations available to the supply chain. Downturns in the *economy* force the supply chain to become more efficient to survive. *Government legislation and import/export controls* add increasing complexity to supply chain operations as multiple country borders are crossed. The study provides a conceptual model of SSP in a supply chain context that remains to be empirically tested.

Structural dimensions appropriate to the supply chain environment have been suggested by several authors. The studies are either purely conceptual or limit empirical testing to a single focal firm. Thus, significant knowledge remains untapped concerning supply chain SSP. A clear presentation of supply chain structural elements is made by Defee and Stank (2005), and a modified version of this typology including information availability will be carried forward into the development of the theory of SCL.

### **Supply Chain Performance**

Performance is an evaluation of how well previously established goals have been met (Mentzer and Konrad 1991). Supply chain goals emerge out of supply chain strategy

deployed through the initiative of a supply chain leader (Defee and Stank 2005). The complexity of supply chain phenomena has made the development of supply chain performance metrics extremely challenging. “There is no evidence that meaningful performance measures that span the supply chain actually exist” (Lambert and Pohlen 2001, p. 1). The difficulty researchers have experienced in measuring supply chain performance points out the importance of getting it right. This section identifies several of the issues associated with measuring supply chain performance, reviews previous performance measurement techniques suggested in the literature, and describes the approach used to determine supply chain performance in this dissertation.

#### *Problems with Performance Measurement*

The evaluation of performance is often difficult because it must be seen across multiple dimensions (Chow, Henrikssen, and Heaver 1995) and organizations frequently have conflicting goals (Chow, Heaver, and Henriksson 1994). Even closely aligned organizations in a supply chain may avoid sharing specific performance information, forcing managers to use internal, firm-specific performance measures as a surrogate for supply chain performance (Lambert and Pohlen 2001). Failure to develop boundary-spanning measures contributes to ineffective SCM outcomes (Bowersox 1995).

Supply chain performance may be viewed as a trade-off between operating at a low cost and delivering high customer service (Mentzer 2004). Customer service performance measurement typically relies on “soft measures”, such as customer perceptions of satisfaction (Chow, Heaver, and Henriksson 1994). Because these measures are vague, “quantitative measures of performance are often preferred to such

qualitative evaluations” (Beamon 1999, p. 275). Soft, perceptual measures must be captured through a survey process, and may limit the researcher’s ability to infer relationships with any degree of confidence (Chow, Heaver, and Henriksson 1994).

An important issue in measuring supply chain performance is the lack of holistic measures spanning all members (Holmberg 2000). End-to-end performance improvement is a primary rationale for implementing SCM processes (Bowersox, Closs, and Cooper 2002; Lambert, Cooper, and Pagh 1998; Mentzer 2004), and the combined performance of all supply chain members is the most appropriate measure (Chow, Henrikssen, and Heaver 1995). The most successful supply chains result when firms view the supply chain in its entirety; less effective supply chains are characterized by organizations lacking a holistic perspective (Anderson, Britt, and Favre 1997). Nevertheless, holistic measures of supply chain performance are missing from most supply chain research (Lambert and Pohlen 2001).

#### *Suggested Approaches to Performance Measurement*

Performance measurement in supply chains should incorporate the characteristics of inclusiveness, universality, measurability and consistency (Beamon 1999). Inclusive measures cover all pertinent aspects of performance. Development of an inclusive set of measures ensures performance is evaluated across multiple dimensions rather than relying on a single measure such as cost. Beamon argues inclusion is the most frequently violated characteristic of supply chain measures as many options are uni-dimensional. Universal measures allow for comparison of performance across various operating conditions. The measurability criterion implies the elements of performance must be

captured accurately. Consistency requires performance measures be aligned with supply chain goals.

Mentzer and Konrad (1991) divide performance into measures of efficiency and effectiveness. Measures of efficiency and effectiveness are needed to properly capture performance in supply chains (Mentzer 2004; 2001). Efficient performance is “*the measure of how well the resources expended are utilized*” (Mentzer and Konrad 1991, p. 34), and is most often equated with the ability of the supply chain to provide the required level of service at the lowest cost (Mentzer 2004). Cost is often the performance measure of choice since cost data are readily available from financial systems (Beamon 1999).

Effectiveness is a measure of *the gap between customer expectations of performance and customer perceptions of the quality of the actual service delivered* (Sharma, Grewal, and Levy 1995). Effectiveness is considered a problematic theoretical construct (Rhea and Shrock 1987), because it cannot be directly observed (Bagozzi 1980). Objective judgments of effectiveness are not available to researchers since these measures are perceptual (Atkinson, Waterhouse, and Wells 1997). Despite the inobservability issue, effectiveness measures are becoming more prominent in supply chain research (Brewer and Speh 2000; Stank and Traichal 1998).

Brewer and Speh (2000) suggest multi-dimensional supply chain performance criteria can be captured using a balanced scorecard approach based on Kaplan and Norton’s (1992) framework. The balanced scorecard uses performance measures across four dimensions: customer perspective, internal business process perspective, innovation and learning perspective, and financial perspective. The basic premise of the balanced scorecard is that the “framework balances the inclination to overemphasize [short-term]

financial performance by incorporating metrics related to the underlying drivers of long-term profitability, namely, the business process measures, innovation and learning measures, and customer satisfaction measures” (Brewer and Speh 2000, p. 83). The authors offer 16 specific measures -- four in each of the four performance dimensions. A difficulty with the balanced scorecard as proposed is that several of the measures require comparison against the performance of competing supply chains. Obtaining competitive data in several of the suggested areas may be difficult.

Lambert and Pohlen (2001) offer a different approach built upon an economic value added (EVA) analysis. In essence, the authors propose an extensive analysis of each dyad in the supply chain to determine areas for improvement that may lead to an improved EVA for the dyad. The analysis is then combined across all dyads in the complete supply chain. A potential problem with this method is the opportunity to sub-optimize supply chain performance because the approach stresses continuous improvement at the dyadic level, rather than a holistic supply chain level.

The preceding discussion suggests three critical elements are necessary to ensure performance is measured appropriately. First, performance must be tied to supply chain strategy and goals. The existence of shared, measurable goals reduces the opportunity for managers to optimize their own organization’s performance at the expense of the broader supply chain (Lambert and Pohlen 2001; Walker 1999). Second, and closely tied to point one, is the importance of developing holistic supply chain goals and metrics. Measurement limited to a level less than the entire supply chain will result in sub-optimized performance as solutions are created to address problems identified through non-holistic measures. Finally, successful performance evaluation is multi-dimensional



and requires coverage of at least efficiency and effectiveness. The strategic profit model approach is suggested as a method that addresses each of these requirements.

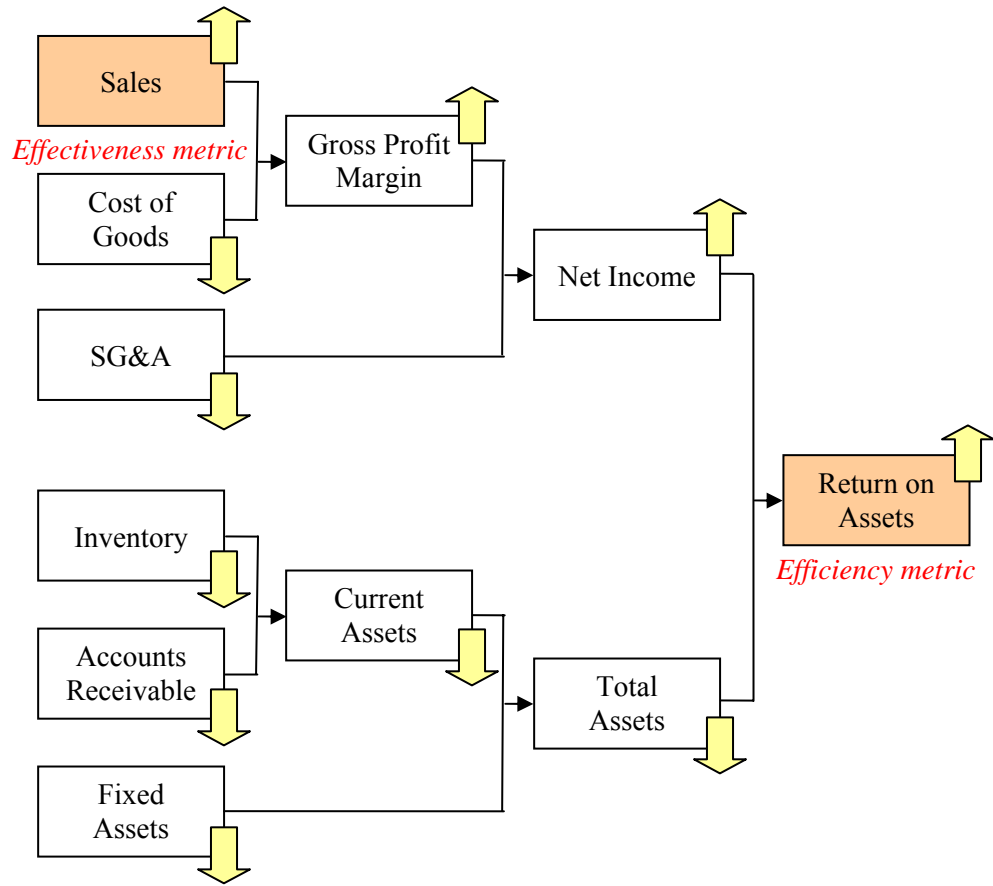
### *The Strategic Profit Model*

Firm's ultimately evaluate their performance through their ability to produce financial results and increase shareholder value (Beamon 1999; Defee and Stank 2005). Efficiency, most closely associated with providing a given level of product or service quality at the lowest possible cost, can be pulled directly from financial statements. Effectiveness is most closely associated with the level of customer service delivered and may also be determined through financial analysis. The strategic profit model, shown in Figure 2.8, presents a method of analysis combining information from the income statement and balance sheet to develop key performance measures. Efficiency is measured through Return on Assets (ROA). The arrows corresponding to each financial element identify the direction of change in the financial numbers needed to improve efficiency. Effectiveness is measured through increased sales volume. Efficiency and effectiveness metrics developed from the strategic profit model are explained below.

### *Measures of Efficiency*

*ROA* is the efficiency metric produced by the strategic profit model. *ROA* is enhanced by increasing Net Income faster than Total Assets. This is accomplished by one or more of several options, including increasing sales, reducing COGS, reducing SG&A, or reducing assets of any type. Operating costs including COGS and SG&A may actually rise, but so long as sales increase at a faster rate, GP and Net Income will increase, and even a minor increase in Net Income will produce an improvement in *ROA* so long as Total Assets do not increase.

**Figure 2.8: The Strategic Profit Model**



When sales are not increasing, the only way to improve ROA is by creating greater operating efficiency or reducing the asset base. For example, operating efficiency is improved by purchasing raw materials at a reduced cost, or reducing the cost of selling and distributing (such as reducing the size of the sales force or shipping product using a less expensive method). Reducing total assets has a similar effect. This may be accomplished by lowering inventory levels, collecting outstanding receivables more rapidly, or selling long-term assets used in the production process.

### *Measures of Effectiveness*

*Sales*, specifically increases in sales, is the effectiveness metric found on the strategic profit model. Effectiveness is driven by delivering improved customer service, and growing sales are a direct result of increased customer satisfaction. Sales growth may occur because existing customers choose to shift purchases from competitors, or because new customers are acquired. Sales growth improves ROA as already described, thus increasing effectiveness may also have a direct impact on efficiency.

Because effectiveness is ultimately determined by customer perceptions of product and/or service quality (Sharma, Grewal, and Levy 1995), an effectiveness metric is needed to gauge customers' level of satisfaction. The *perfect order* criterion fills that requirement, and may be easily calculated in most instances. For an order to be "perfect" it must fulfill all customer expectations including being delivered on time, to the correct customer, with the right product (or service), in the right quantity, without defects, and without sustaining any damage in transit. A perfect order metric is simply the number of perfect orders divided by the total number of orders in a given time frame. Customers

must be solicited in order to obtain the number of perfect orders, and this may be accomplished by delivery personnel at the time the order is delivered or at a later time.

The approach to measuring efficiency and effectiveness described above most readily accommodates performance measurement for a single organization rather than for an entire supply chain. These metrics can also be summed across all organizations in a supply chain to determine holistic supply chain performance.

#### *Summary of Performance Measurement*

Supply chain performance is difficult to capture because it is found along multiple, often competing, dimensions such as efficiency and effectiveness. Holistic performance measures are difficult to find in practice because supply chain member organizations may be hesitant to share closely guarded operating and financial information. An approach to determining performance has been suggested based on the strategic profit model and perfect order criteria.

### **CONCEPTUALIZING THE THEORY OF SUPPLY CHAIN LEADERSHIP**

The leadership literature describes the role individuals play as leaders and followers in groups, organizations, and societies. However, leadership is also found in the macro context of inter-organizational leader-follower relationships in the supply chain environment. Leadership is necessary to coordinate the efforts of multiple firms in a supply chain in order for the supply chain to function effectively (Bowersox and Closs 1996; Lambert, Stock, and Ellram 1998). While leadership is critical to supply chain success, SCL is not well understood. No theory exists to explain how a firm becomes the

supply chain leader, and maintains that role over time, and thus no basis exists to predict supply chain outcomes that are influenced by SCL.

Primary goals of this research initiative include developing definitions of supply chain leadership and supply chain followership, and formalizing a theory of supply chain leadership incorporating both SCL and SCF concepts. The definitions of SCL and SCF are developed in the next section by placing the concepts within a transformational leadership framework. The theoretical model of SCL is then presented and the supporting hypotheses are explained.

## **Establishing a Definition of Supply Chain Leadership**

### *Inconsistent Uses of SCL*

Ellram and Cooper (1990) equate supply chain leaders to channel captains (Stern and El-Ansary 1988), or channel leaders (Etgar 1977; 1978; Lusch and Ross 1985) from the marketing channels literature. One difficulty with this comparison is the level of analysis found in the channels literature. Emphasis in marketing channels is directed toward a single focal firm, typically a manufacturer. Channels theory is developed with the intention of maximizing the outcome for the focal firm, with less regard for negative impacts that may befall other channel members.

A second difference is seen in the importance of control and conflict management. In a channels context, a primary goal of the focal firm to assert its control over other channel members through the exercise of power (Gaski and Nevin 1985; Hunt and Nevin 1974). Channel leaders also utilize power to facilitate conflict management strategies (Gaski 1984). Conflict occurs when member organizations resist the channel

leader's attempts to maintain control over channel activities (Cadotte and Stern 1979; Etgar 1979; Molnar and Rogers 1979). The focus on control and conflict management place channel leaders in a world of arms-length, transactional relationships that differs from the more collaborative supply chain environment (Skjoett-Larson, Thernoe, and Andresen 2003). Thus, equating channel leaders to supply chain leaders is not appropriate.

SCL has been used in several other contexts. One use of the term is the label given to a firm that provides a source of best practices (Anon 2005). A more common use is in describing the best performing firm in an industry (Burnson 2003; Harrison and New 2002). In this regard, a recent joint study conducted by Accenture, Stanford and INSEAD finds supply chain leaders show growth in market capitalization 26% higher than average, while non-leaders experience reduced market capitalization (Byrne 2004). Occasionally SCL is applied to a firm that excels on a single dimension of performance such as cost leadership (Sankaran and Luxton 2003) or ECR leadership (Stank, Crum, and Arango 1999). SCL is also used to describe managers as thought leaders in the supply chain discipline (Fawcett and Magnan 2004; Williams 2004). A supply chain leader in each of these contexts is a distinction earned after something of value has been accomplished. The uses of SCL outlined above are not aligned with the view of leadership presented earlier, as a relationship-oriented process of influence used to create a vision, establish shared goals and encourage the accomplishment of those goals. A clarified definition of SCL is needed to guide development of the theory of SCL.

### *Placing SCL in the Proper Context*

SCL has frequently been a label applied to the largest, most powerful firm in the supply chain. A supply chain leader may use its power to dominate supply chain members to achieve overall supply chain goals like increased collaboration or tighter integration (Maloni and Benton 2000). Wal-Mart, Dell, and Toyota are examples of supply chain leaders whose power is based on size and economic might. Power-based SCL can develop from other sources. A firm may become a leader because it possesses control over an information source critical to the success of other supply chain members. Retailers control access to mountains of customer purchase data that can be used by upstream firms to refine product designs and tailor production and distribution processes. The fact that retailers possess this information places many of them in a leadership position, and is consistent with the downstream shift of power downstream in supply chains (LaLonde and Masters 1994).

SCL is not predestined to the largest or most profitable organization in all cases. A leader may emerge when it develops a distinctive capability that benefits other supply chain members, or SCL may accrue to a smaller, specially skilled organization when a special expertise is lacking from an otherwise more powerful firm. For example, third party logistics (3PL) providers may find themselves in a position of leadership because of the more efficient product flow processes they have developed.

### *Creating the Definition of SCL*

Four core elements of leadership were previously summarized in Table 2.3, and are now applied to supply chain organizations to guide creation of the definition of SCL.

First, the essence of leadership in a supply chain is found in the ability to *influence the actions of another organization* (Hoyt and Blascovich 2003; Yukl 2001). Second, SCL *identifies the supply chain leader and distinguishes it from supply chain follower organizations* (Shamir 1999). The supply chain leader should possess some power source that aids in identifying the leader (Janda 1960), but power is not necessarily legitimate power based on positional authority (Jacobs 1970).

Third, the supply chain leader is the organization that *identifies a need for change and creates a vision* of a better future as a rallying point for all supply chain members (Podsakoff et al. 1990). This criterion resonates from a recent qualitative analysis. The most frequently mentioned characteristic of supply chain leaders identified through a content analysis of a panel of supply chain experts is vision (Defee 2006). Several participant comments are telling in this regard:

“I probably see [supply chain] leadership as more of a *vision*...seeing where the market is headed, where the trends are going. How do we pioneer ideas or take some ideas outside the box and try and implement them? It’s more a situation of seeing there are other ideas out there and trying to implement them.”

“...I think it has to be from a *visionary*...after the team from an internal perspective gets the vision, understands the mission, and has the zeal, then they go out and partner with customers or suppliers, because in order to make it happen you can’t do it by yourself. Very little supply chain excellence is done by a single organization...it’s got to be a supplier with a company, a company with a customer that makes the significant breakthrough.”

“...the leader [organization] also has to be a marketer. There’s got to be some sort of a mantra, or almost a religious belief system, that the *vision* that the leader puts out...every organization understands it, not just intellectually, but viscerally as well. They feel it in their gut that this is the right thing to do.”



Fourth, SCL should be seen as a *relational* concept (Graen and Uhl-Bien 1995; Kouzes and Posner 2004). Supply chain leaders and supply chain followers are co-influencing (Grundstien-Amado 1999). Because the supply chain follower has an opportunity to influence the supply chain leader, there is a greater chance the leader and follower will create truly shared goals. Since supply chain followers have been given a chance to affect the leader's values, goals, and vision, followers may freely put forth extra effort to accomplish supply chain objectives.

The preceding discussion provides the background necessary to create the definition of SCL proposed in this dissertation as follows:

*SCL is a relational concept between a supply chain leader and one or more supply chain follower organizations. SCL is characterized by the ability of one organization in a supply chain to exert influence over other member organizations in order to increase supply chain follower compliance with and commitment to the leader's vision for the entire supply chain. SCL influence extends over the establishment of shared values, standard operating procedures, and norms of behavior.*

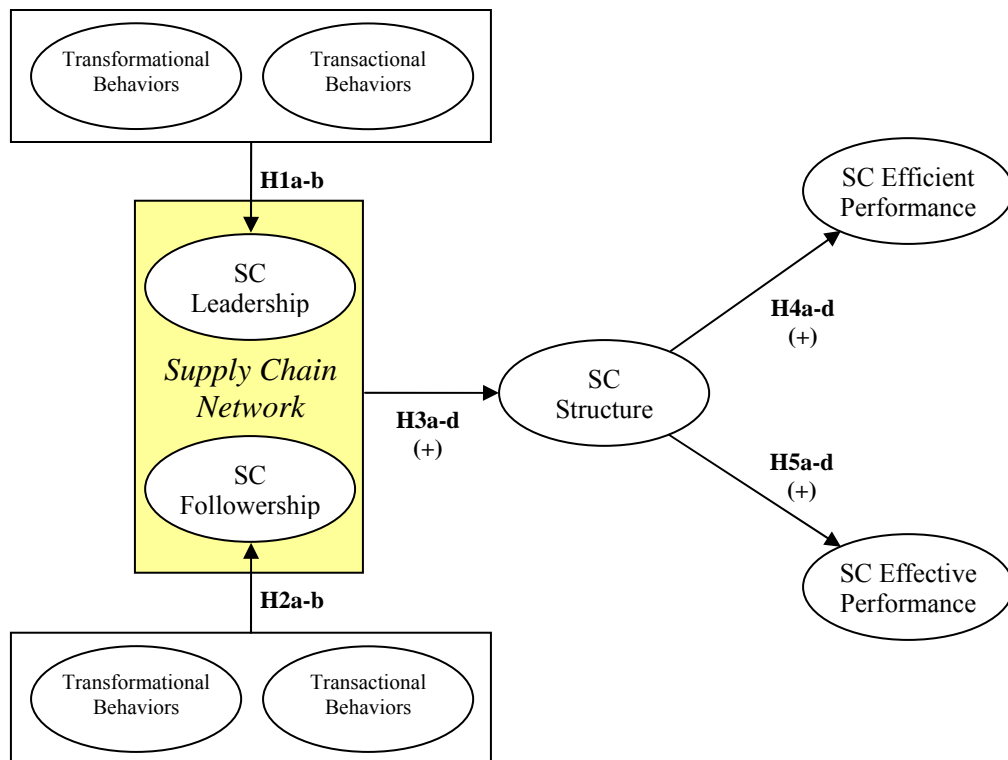
Similarly, and in line with the definition of followership presented earlier, SCF is defined in this dissertation as follows:

*SCF is a relational concept involving a supply chain leader and a supply chain follower in which the follower exhibits proactive inter-organizational behaviors intended to help the extended supply chain achieve its goals. The supply chain follower organization chooses to work toward supply chain leader-defined goals so long as they align with holistic supply chain objectives. When supply chain leader goals diverge the supply chain follower takes the initiative to challenge the leader and attempt to re-align leader-directed actions with the interests of all supply chain members.*

## A Model of Supply Chain Leadership

The theoretical model of supply chain leadership is presented in Figure 2.9. The model is conceptualized under a SSP framework and uses transformational leadership theory to describe the SCL and SCF styles projected by leader and follower organizations. The combination of SCL and SCF styles is considered a manifestation of supply chain strategy (Defee and Stank 2005; Stank, Davis, and Fugate 2005), similar to the relational strategy suggested in a recent study (Rodrigues, Stank, and Lynch 2004). This section describes the model and presents the rationale for associated hypotheses.

**Figure 2.9: Theoretical Model of Supply Chain Leadership**



### *Distinguishing Characteristics of Supply Chain Leadership*

Three characteristics are proposed to distinguish leaders from followers: power, vision, and need for control. Each of these has been previously described in the Leadership and Followership sections of this chapter. These are complex issues that need to be better understood. However, as antecedents they are outside the scope of this investigation and are not included in the theoretical model presented above. The concepts are noted here to reinforce the point that a distinction should be made between leaders and followers. Additional research is merited to clarify criteria that segment leaders from followers.

### *Transformational versus Transactional SCL*

The *style* of SCL exhibited by supply chain leaders may differ depending on the goals of the leader, the challenges presented in the environment, and the type of relationship desired with members. SCL styles are considered a visible manifestation of supply chain strategy in this dissertation, and the leadership style exhibited will have a direct effect on the structures and performance that result in the supply chain (Defee and Stank 2005; Rodrigues, Stank, and Lynch 2004; Stank, Davis, and Fugate 2005; Stock, Greis, and Kasarda 1999).

Transformational leadership theory suggests supply chain leaders should be characterized by the transformational versus transactional behaviors they exhibit. Supply chain leaders should (a) be most effective when using more transformational behaviors (Bass 1999; Jung and Avolio 2000; Podsakoff et al. 1990), (b) encourage followers to establish mutually held goals (Burns 1978), and (c) create relationships that motivate

supply chain followers to produce extra effort (Bass 1985a). Transformational supply chain leadership is characterized by three types of behavior: inspiration, intellectual stimulation, and individualized consideration.

*Inspirational Behavior.* Supply chain leaders clarify the mission of the supply chain and encourage members to “buy-in” to the mission (Bennis 1983). The mission may be based on supply chain leader values, or mutually developed values identified between supply chain members. The supply chain leader is responsible for articulating the vision of the future supply chain environment (Podsakoff et al. 1990). *Communication of the mission and values* are examples of idealized influence behavior (Hater and Bass 1988). *Articulation of the vision*, the plan for achieving the vision, and expectations of follower performance are examples of inspirational behavior (Avolio, Bass, and Jung 1999; Bass 1985a). The concepts of mission, values and vision are intertwined, and these leader behaviors often combine under a single factor (Avolio, Bass, and Jung 1999; Bass 1985a; Hater and Bass 1988). These behaviors are grouped under the heading of *inspiration* in this dissertation. Supply chain leaders that prefer to motivate supply chain followers through inspirational behaviors are classified as transformational supply chain leaders.

*Intellectual Stimulation Behavior.* Supply chain leaders must ensure operational problems are addressed. The supply chain leader may attempt to correct a problem on its own or choose to challenge supply chain followers to develop better solutions to supply chain issues (Kouzes and Posner 2004). Effective supply chain leaders look to leverage the distinctive skills and capabilities of members to achieve greater success and encourage creativity among supply chain followers by outlining a problem and engaging

in dialogue with members (Bass 1985a). This is an example of *intellectual stimulation* behavior. Supply chain leaders that prefer to *motivate creativity and innovation* throughout the supply chain by using intellectual stimulation behaviors are classified as transformational supply chain leaders.

*Idealized Consideration Behavior.* Individual supply chain followers possess different skills, and have different organizational goals. Effective supply chain leaders understand that each member organization has unique needs, and approaches each inter-organizational relationship separately (Sashkin and Burke 1990). Some supply chain followers require mentoring to develop needed capabilities; other supply chain followers desire the opportunity to take on new challenges facing the supply chain. These are examples of *individualized consideration* behaviors (Avolio, Bass, and Jung 1999; Bass 1985a; Hater and Bass 1988). In either case, the supply chain leader must understand and *appreciate the distinct needs of each member* organization and adjust each relationship accordingly. Supply chain leaders that approach inter-organizational development activities based on the unique needs of each follower are classified as transformational supply chain leaders.

Not all leader-follower relationships require a transformational approach. A consistent finding in the transformational leadership literature is that all leaders utilize transactional behaviors (Avolio, Bass, and Jung 1999; Bycio, Hackett, and Allen 1995; Den Hartog, Muijen, and Koopman 2001; Jung and Avolio 2000). Certain relationships are best supported by simple, direct transactional exchanges rather than more elaborate and time consuming transformational behaviors. Contingent reward and management-by-exception (Bass 1985a) are transactional behaviors supply chain leaders may exhibit.

*Contingent Reward Behavior.* Supply chain leaders deal with other members transactionally through *contracts* that designate the nature of the exchange between the parties (Dwyer and Oh 1988). Contracts are a typical governance device found in supply chains (Rinehart et al. 2004), and a contract exists between supply chain members, whether verbal or written, in essentially all inter-organizational relationships (Williamson 1979). Contracts specify terms that spell out the rewards and punishments applicable to each member party, providing a means for the supply chain leader to manage supply chain relations using *contingent reward and punishment* behaviors. Supply chain leaders that prefer to manage inter-organizational relations primarily through the establishment of contracts are classified as transactional supply chain leaders.

*Management-by-exception Behavior.* Another transactional behavior found in supply chains is *formal exception reporting* provided by members. This type of reporting is facilitated by inter-connected information systems that provide visibility to all supply chain members (Kent and Mentzer 2003; Mentzer 2001). Exception reporting may be used by a supply chain leader to quickly identify operational problems that can lead to reduced performance. Exception reporting is considered a form of *management-by-exception* available to the supply chain leader. Supply chain leaders preferring to manage inter-organizational relations primarily through exception reporting are classified as transactional supply chain leaders. Thus, hypothesis 1 is:

**H1:** Transformational supply chain leaders are distinguished from transactional supply chain leaders by the behaviors exhibited:

**H1a:** *Transformational supply chain leaders* more frequently exhibit transformational behaviors, including greater use of inspiration, intellectual stimulation, and individualized consideration.

**H1b:** *Transactional supply chain leaders* exhibit transformational behaviors less frequently, and primarily utilize the transactional behaviors of contingent reward and management-by exception.

### *Transformational versus Transactional SCF*

The importance of supply chain followers to supply chain success should not be underestimated. Multiple supply chain follower organizations support a single supply chain leader organization in most situations and their greater number suggests followers perform the majority of tasks. An exception resides in highly vertically integrated supply chains where activities across multiple echelons are performed by the supply chain leader. This forms a boundary condition to the theory of SCL not explored in this dissertation. A major premise of the theory of SCL is that supply chain followers can be categorized as transformational or transactional by the behaviors they exhibit, as with the supply chain leader classification scheme. Five dimensions describing a transformational follower were presented in Figure 2.5, including maintaining an independent mindset, critical thinking ability, willingness to assume responsibility, desire to collaborate, and a deep commitment to the organization. All followers should exhibit these characteristics to a greater or lesser degree. These five dimensions are used to differentiate transformational from transactional supply chain followers.

Transformational supply chain followers maintain an *independent mindset*. Managers in this type of organization hold on strongly to the values of the organization and believe the organization's approach to conducting business is "right". Transformational supply chain followers will attempt to explain their own value set to the supply chain leader and work with the leader to create a mutually agreeable set of values

before committing to the vision articulated by the supply chain leader. Establishing shared mission, vision and values with the supply chain leader is not a priority for transactional supply chain followers. Transactional supply chain followers may demonstrate less commitment to their own organization's value set, and accept the supply chain leader's mission and values without question.

Transformational supply chain followers demonstrate a *critical thinking* ability concerning supply chain activities. Transformational follower organizations look for better ways to carry out supply chain processes, and freely offer ideas and constructive criticism to the supply chain leader and other members in the desire to improve overall supply chain performance. Championing new ideas is a central characteristic of transformational supply chain followers. Transformational supply chain followers are valuable contributors because their efforts target improvements in supply chain-wide performance. Transactional supply chain followers resist change initiatives, and strive to optimize existing processes rather than attempt significant change.

Transformational supply chain followers *assume responsibility* for their own performance and proactively identify issues within their span of control. Once their own organization's performance reaches an acceptable level, this type of follower looks to take on additional tasks. Transactional supply chain followers do not proactively seek out additional responsibilities unless they are tied to immediate rewards. This type of organization may react positively to specific directions provided by the supply chain leader and will rarely question the leader's decision.

Transformational follower organizations are more *collaborative* than transactional organizations. This SCF style routinely reaches out to other member organizations,



developing strong relationships that may be leveraged in current and future collaborative efforts. In comparison, transactional supply chain followers will be less collaborative, and when choosing to collaborate will focus on collaborations where immediate rewards (or punishments for failure) are administered by the supply chain leader.

Transformational supply chain followers consistently demonstrate a *commitment to the supply chain as a whole*. This commitment is rooted in the creation of a shared purpose with the supply chain leader established through the vision. Transformational followers will challenge the supply chain leader if that organization makes decisions not in the best interest of holistic supply chain performance. Transactional supply chain followers are most concerned with improving their own organization's performance and have only a limited interest in improving supply chain processes that may benefit other members. This leads to hypothesis 2:

- H2:** Transformational supply chain followers are distinguished from transactional supply chain followers by the behaviors exhibited:
- H2a:** *Transformational supply chain followers* more frequently exhibit transformational behaviors, including a greater degree of independence, critical thinking, assumption of responsibility, collaboration, and commitment to supply chain success.
- H2b:** *Transactional supply chain followers* exhibit transformational behaviors less frequently, as demonstrated through passive acceptance of leader direction, resistance to change, avoidance of extra responsibilities, collaboration limited to organizational gain, and commitment to own organization performance results.

### *Supply Chain Networks*

SCL is a relational concept of reciprocal influence between supply chain leaders and supply chain followers. To support the definition, leaders and followers are grouped into *supply chain networks* identified by the combinations of leadership and followership

style reflected in Figure 2.10. This conceptualization of the supply chain facilitates the development of supply chain structural and performance hypotheses.

*Transformational supply chain networks* are defined as supply chains composed of a transformational supply chain leader and multiple transformational supply chain followers. Transformational supply chain networks are populated by organizations working toward a shared vision of an improved future supply chain (Bass 1985a; Podsakoff et al. 1990). Transformational supply chain networks are viewed holistically by members working collectively to improve overall supply chain performance (Kouzes and Posner 1987; 2004). Operational flexibility becomes an important element necessary for dealing with future uncertainties. Thus, the members will tend to focus more heavily on effectiveness as the primary performance criterion (Hoyt and Blascovich 2003; Jung and Avolio 2000).

**Figure 2.10: Supply Chain Network Classification**

		<u>Supply Chain Leadership</u>	
		Transformational	Transactional
<u>Supply Chain Followership</u>	Transformational	<i>Transformational Supply Chain Network</i> <span style="float: right;">①</span>	<i>Mis-Matched Supply Chain Network</i> <span style="float: right;">②</span>
	Transactional	<span style="float: right;">③</span> <i>Mis-Matched Supply Chain Network</i>	<span style="float: right;">④</span> <i>Transactional Supply Chain Network</i>

*Transactional supply chain networks* are defined as supply chains comprised of a transactional supply chain leader and multiple transactional supply chain followers. The primary goal is to streamline processes to ensure low operating costs (Jung and Avolio 2000; Masi and Cooke 2000). Each organization maintains its own set of priorities, and strives to negotiate contractual relationships that optimize individual organizational performance (Keller and Szilagyí 1976). Shared goals are developed only to the extent contracts align around common operating requirements. The supply chain leader has the opportunity to establish rules and policies that favor its own performance outcomes over those of supply chain followers and/or total supply chain results. Efficiency is the primary success criterion in purely transactional supply chain networks. Accommodating change is more difficult than in a transformational network because system and process flexibility may not have been built in originally.

Supply chain networks may not include alignment of transformational supply chain leaders and followers or transactional supply chain leaders and followers. These supply chains are considered *mismatched supply chains*. A transformational supply chain leader may desire greater effectiveness over time through a continuous change program, but when teamed with a group of transactional supply chain followers the resulting supply chain may experience inefficient performance as members are encouraged to make changes to otherwise streamlined processes. Lacking commitment to an agreed upon future vision, the follower organizations will not enthusiastically pursue the change role, and inefficiencies may result throughout an elongated transformation process. A transactional supply chain leader may target efficiency, but when teamed with a group of transformational supply chain followers the resulting supply chain may produce

ineffective performance as members spend valuable time and effort lobbying the leader for changes they perceive as necessary. Mis-matched networks are not the focus of this investigation and are not covered in depth in the following sections.

*Supply Chain Networks and Structural Outcomes*

Four elements of supply chain structure describe the organizing framework of the supply chain in this dissertation, including information availability, communications, decision-making authority and rewards (Defee and Stank 2005). Each structural element is posited as closely associated with either transformational or transactionally-oriented organizations. The hypothesized supply chain network structural outcomes are summarized in Figure 2.11.

**Figure 2.11: Predicted Supply Chain Structural Matrix**

		Supply Chain Leadership	
		Transformational	Transactional
Supply Chain Followership	Transformational	<p><u><i>Effective Supply Chain</i></u></p> <ul style="list-style-type: none"> <li>• Wide info. availability</li> <li>• Informal communication</li> <li>• Decentralized decisions</li> <li>• Holistic rewards</li> </ul>	<p><i>Ineffective</i></p> <p><i>Not tested in this dissertation</i></p>
	Transactional	<p><i>Inefficient</i></p> <p><i>Not tested in this dissertation</i></p>	<p><u><i>Efficient Supply Chain</i></u></p> <ul style="list-style-type: none"> <li>• Limited info. availability</li> <li>• Formal communication</li> <li>• Centralized decisions</li> <li>• Firm-specific rewards</li> </ul>

Mentzer (2004, p. 167) notes that “a key aspect of SCM is the ability to make strategic decisions quickly, based on accurate information”. Information systems form the backbone of most supply chains (Cooke 1999), and are a critical integrating mechanism (Kent and Mentzer 2003). Collaboration among members is facilitated by the existence of highly capable information systems (Sanders and Premus 2002; 2005). Information systems determine the degree of *information availability* present in the supply chain. Information availability is “the capability to exchange information with internal and external supply chain members in a timely, responsive, and useable format” (Defee and Stank 2005, p. 35).

Supply chain information systems are characterized along two dimensions. *Wide information availability* is found when most or all supply chain members have access to supply chain volume and variability information such as customer ordering patterns and supply or production constraints. Wide information availability helps the supply chain respond early to supply and demand problems (Mentzer 2004), and allows the supply chain to become more agile (Goldsby, Griffis, and Roath 2006). Supply chains are more efficient and effective when members share information immediately through interconnected information systems (Bowersox, Closs, and Stank 1999; Mentzer 2001). Supply chains providing wider information availability for members should be more closely associated with transformational supply chain networks.

*Limited information availability* occurs in supply chains when members view their procurement, order, and inventory information as proprietary. Information may only be made available as other members agree to make a concession that benefits the organization possessing the information. As a converse to the points above, supply

chains with limited information availability may be less responsive and less agile. Supply chains that limit information availability among members should be more closely associated with transactional supply chain networks

*Communication* is the glue that holds a supply chain network together (Mohr and Nevin 1990). Oral and written communications are highly important SCM skills (Gammelgaard and Larson 2001). Communication among managers from multiple supply chain organizations is important to successful SCM (Large and Gimenez 2006). Trust and relationship closeness is created by consistent communication among supply chain partners (Chu and Fang 2006; Hutt et al. 2000). Member satisfaction increases with improved quality of communication (Mohr and Spekman 1994), and relationship performance improves with communication frequency (Morris, Brunyee, and Page 1998).

Communication is characterized along two dimensions. *Formal communication* results from formal authority relationships and formal mechanisms for the coordination of work (Johnson et al. 1994). Formal communication generally flows from authority. The type and frequency of formal communication is established by the supply chain leader, and is facilitated by supply chain information systems used to share data across members (Mentzer 2004). Formal communication allows a powerful supply chain leader to maintain control over supply chain follower activities, and can therefore be seen as a type of management-by-exception behavior. Thus, formal communication should be more closely associated with transactional supply chain networks.

*Informal communication* occurs outside the formal communication flow and facilitates group cohesiveness (Johnson et al. 1994). Less formal communication among boundary spanning managers aids in the creation of shared goals (Ring and Van De Ven

1994), and facilitates tighter integration across member organizations (Pagell 2004). Because it is not limited to a fixed schedule, informal communication may be the fastest conduit of critical information. Informal communication is flexible, associating it more closely with transformational supply chain networks.

The locus of *decision-making authority* describes where decisions are made in the supply chain, and is characterized along two dimensions. *Centralized decision making* represents the more traditional approach. Centralizing decisions requires the supply chain leader to retain responsibility for more decisions effecting supply chain operations. Decisions are centralized to increase control over supply chain activities (Droge and Germain 1989; Stank and Traichal 1998), and improve the consistency of supply chain operations (Defee and Stank 2005). Because centralized decision-making is intended to increase control over supply chain followers, it should be more closely associated with transactional supply chain networks.

*Decentralized decision-making* pushes authority away from the supply chain leader and places greater responsibility on supply chain followers. Better decisions are possible when handled locally because managers possess intimate knowledge of the issues (Nault 1998). Quick resolution of operational problems is an essential element of effective supply chains (Mollenkopf, Gibson, and Ozanne 2000). Giving increased decision-making authority to supply chain followers facilitates rapid decision making and allows more creative, flexible solutions to emerge as experience outside the supply chain leader are utilized. Increased responsiveness implies decentralized decision-making should be more closely associated with transformational supply chain networks.

*Rewards* are the compensation each member receives for carrying out their responsibilities. Rewards have traditionally been designed to maximize the benefit of the organization developing the compensation plan. Although the literature has consistently concluded rewards need to target holistic supply chain performance (Bowersox, Closs, and Cooper 2002; Holmberg 2000; Lambert and Pohlen 2001; Mentzer 2004), few supply chains have instituted such a system and continue to rely on firm-specific performance to determine rewards (Brewer and Speh 2000). *Firm-specific rewards* refer to compensation accruing to a supply chain member based on that firm's ability to optimize its own performance. Firm-specific rewards are frequently used since many firms are hesitant to share financial and operational information with supply chain partners (Lambert and Pohlen 2001). Firm-specific reward structures incent supply chain organizations to maximize their own performance, perhaps at the expense of other members (Bowersox, Closs, and Stank 1999). The focus on maximizing organizational rewards links firm-specific rewards more closely to transactional supply chain networks.

*Holistic supply chain rewards* provide compensation to all members based on overall supply chain performance results rather than individual organization results. Members should be compensated based upon their own specific contribution to the achievement of holistically stated goals. Holistic reward structures may require managers to sub-optimize their own organization's performance for the good of the supply chain (Bowersox, Closs, and Stank 1999; Cooper, Lambert, and Pagh 1997). Replacing individual (firm-specific) goals with larger group (supply chain) goals is a transformational outcome, and the establishment of holistic goals and rewards is posited as a transformational network outcome. The preceding discussion leads to hypothesis 3:



- H3:** The greater the degree of transformational supply chain strategy exhibited by a supply chain network:
- H3a:** the wider the information availability among members.
- H3b:** the greater the degree of informal communications.
- H3c:** the greater the degree of decentralized decision-making.
- H3d:** the greater the degree of holistic rewards.

*Supply Chain Networks and Performance*

Supply chains exhibiting structures that fit supply chain strategies, should produce better performance than poorly aligned supply chains (Chow, Henrikssen, and Heaver 1995; Defee and Stank 2005). This outcome should be true for both transformational and transactional supply chain networks. Mis-matched supply chain networks should underperform more aligned networks. The hypothesized supply chain network performance outcomes are summarized in Figure 2.12.

**Figure 2.12: Predicted Supply Chain Performance Matrix**

		Supply Chain Leadership	
		Transformational	Transactional
Supply Chain Followership	Transformational	<u><i>Effective Supply Chain</i></u> • SC-wide performance - Efficiency: Higher - Effectiveness: Higher	Effective: Lowest Efficient: Low <i>Not tested in this dissertation</i>
	Transactional	Effective: Low Efficient: Lowest <i>Not tested in this dissertation</i>	<u><i>Efficient Supply Chain</i></u> • SC-wide performance - Efficiency: Lower - Effectiveness: Lower

### *Efficient Holistic Performance*

A problem found in past examinations of supply chain performance is the measurement of holistic performance has rarely been attempted and firm-specific measures have often been substituted (Lambert and Pohlen 2001). A primary purpose of this dissertation is to investigate holistic supply chain performance, and therefore total supply chain performance is the performance outcome of interest. As stated previously, supply chain performance is captured along the two dimensions of efficiency and effectiveness (Mentzer and Konrad 1991).

Transformational supply chain networks should produce more efficient performance than transactional supply chain networks because supply chain processes are evaluated holistically rather than as a series of dyadic exchanges. A holistic view provides a greater opportunity to drive out inefficiencies that cannot be seen when viewed from a dyadic perspective (Brewer and Speh 2000). The lack of supply chain-wide performance metrics encourages each organization in transactional supply chain networks to optimize its own performance (Lambert and Pohlen 2001). This suggests supply chain-wide efficient performance will be sub-optimized in transactional networks. Transformational networks are posited to develop transformational structures including wider information availability, informal communications, decentralized decision-making, and holistic rewards. These transformational structural elements should have a positive effect on efficient supply chain performance. This leads to hypothesis 4:

- H4a:** The wider the information availability exhibited in the supply chain the greater the efficient holistic performance.
- H4b:** The greater the degree of informal communications exhibited in the supply chain the greater the efficient holistic performance.

- H4c:** The greater the degree of decentralized decision-making exhibited in the supply chain the greater the efficient holistic performance.
- H4d:** The greater the degree of holistic rewards exhibited in the supply chain the greater the efficient holistic performance.

#### *Effective Holistic Performance*

Transformational supply chain networks focus on effective operations supporting high end-customer service levels (Hoyt and Blascovich 2003). This is facilitated by holistic goals and reward structures (Bass 1985a; Defee and Stank 2005). The emphasis on supply chain-wide goals and rewards motivates transformational supply chain leaders and followers to work collaboratively to create innovative process improvements (Hater and Bass 1988). A collective improvement approach should result in more effective processes because the best thinking of multiple organizations has been poured into the design, as opposed to the abilities of only the supply chain leader in a transactional supply chain. This suggests transformational networks will be more effective than transactional networks. The transformational supply chain network structures recapped above should have a positive effect on effective supply chain performance. This leads to hypothesis 5:

- H5a:** The wider the information availability exhibited in the supply chain the greater the effective holistic performance.
- H5b:** The greater the degree of informal communications exhibited in the supply chain the greater the effective holistic performance.
- H5c:** The greater the degree of decentralized decision-making exhibited in the supply chain the greater the effective holistic performance.
- H5d:** The greater the degree of holistic rewards exhibited in the supply chain the greater the effective holistic performance.

### *Summary of the Theory of SCL*

A premise of the theory of SCL outlined in this section is that the concept of leadership is appropriately assigned to organizations within a supply chain. The theory developed in this dissertation is the first known use of leadership theory, specifically transformational leadership theory, in this broader context. This section presented definitions of SCL and SCF derived from definitions taken from the leadership literature. The conceptual model of SCL presented in Figure 2.9 has been explained through four supporting hypotheses.

## CHAPTER 3 – RESEARCH METHOD AND THEORY TESTING

This chapter explains the research methodology chosen to test the theory of SCL and associated hypotheses described in chapter 2. First, the hypotheses are reviewed and the theoretical model is presented in the form of a structural equation model. Next the research design is described, including the sampling plan and data collection approach within a simulation context. This is followed by a description of the measurement development process, including construct operationalization and scale development. The pre-testing plan is presented with an emphasis on the scale purification process. Finally, the data collection approach is outlined and the method of analysis using structural equation modeling is described.

### STRUCTURAL EQUATION MODEL

This section presents the structural equation model derived from the conceptual model of SCL introduced in chapter 2. The hypotheses supporting the model are:

- **H1:** Transformational supply chain leaders are distinguished from transactional supply chain leaders by the behaviors exhibited:
- **H1a:** *Transformational supply chain leaders* more frequently exhibit transformational behaviors, including greater use of inspiration, intellectual stimulation, and individualized consideration.
- **H1b:** *Transactional supply chain leaders* exhibit transformational behaviors less frequently, and primarily utilize the transactional behaviors of contingent reward and management-by exception.
- **H2:** Transformational supply chain followers are distinguished from transactional supply chain followers by the behaviors exhibited:
- **H2a:** *Transformational supply chain followers* more frequently exhibit transformational behaviors, including a greater degree of independence, critical thinking, assumption of responsibility, collaboration, and commitment to supply chain success.
- **H2b:** *Transactional supply chain followers* exhibit transformational behaviors less frequently, as demonstrated through passive acceptance of leader direction, resistance to change, avoidance of

extra responsibilities, collaboration limited to organizational gain, and commitment to own organization performance results.

- **H3:** The greater the degree of *transformational supply chain strategy* exhibited by a supply chain network:
  - **H3a:** the wider the information availability among members.
  - **H3b:** the greater the degree of informal communications.
  - **H3c:** the greater the degree of decentralized decision-making.
  - **H3d:** the greater the degree of holistic rewards.
  
- **H4a:** The wider the information availability exhibited in the supply chain the greater the efficient holistic performance.
- **H4b:** The greater the degree of informal communications exhibited in the supply chain the greater the efficient holistic performance.
- **H4c:** The greater the degree of decentralized decision-making exhibited in the supply chain the greater the efficient holistic performance.
- **H4d:** The greater the degree of holistic rewards exhibited in the supply chain the greater the efficient holistic performance.
  
- **H5a:** The wider the information availability exhibited in the supply chain the greater the effective holistic performance.
- **H5b:** The greater the degree of informal communications exhibited in the supply chain the greater the effective holistic performance.
- **H5c:** The greater the degree of decentralized decision-making exhibited in the supply chain the greater the effective holistic performance.
- **H5d:** The greater the degree of holistic rewards exhibited in the supply chain the greater the effective holistic performance.

The model identifies 10 latent exogenous (independent) variables and seven latent endogenous (dependent) variables. The exogenous variables are the five dimensions of SCL (inspirational behavior, intellectual stimulation, individualized consideration, contingent reward, and management-by-exception) and the five dimensions of SCF (independent mindset, critical thinking, assume responsibility, collaboration, and supply chain commitment). SCL is a second order formative construct formed by the five dimensions of SCL. Similarly, SCF is a second order formative construct comprised of

the five dimensions of SCF. The relationships among the 17 constructs are demonstrated by the directional paths representing the nomological network shown in Figure 3.1.

## **RESEARCH DESIGN**

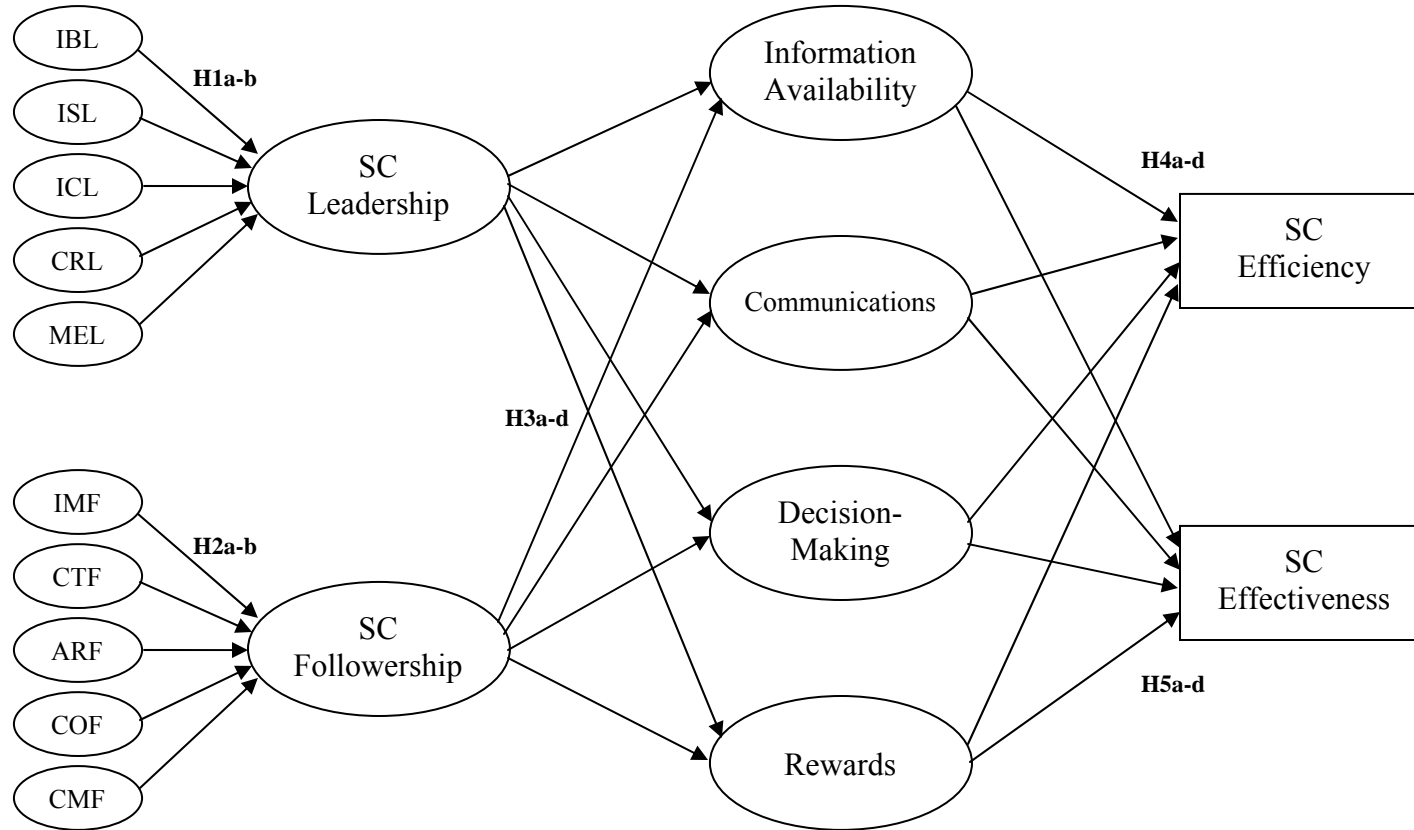
Supply chains are complex systems and the interaction of the multiple entities makes the phenomenon difficult to effectively model. The supply chain is a *noisy* environment prone to the impact of extraneous forces. The research design selected must deal with this complexity and extract variance associated with the variables of interest while limiting the effect of external influences. An experimental design is employed in this dissertation in order to capture the essence of the complex supply chain phenomenon presented in Figure 3.1.

Experimental designs attempt to maximize systematic variance attributable to the independent variable(s), control extraneous systematic variance, and minimize error variance (Kerlinger and Lee 2000). Experimental design provides the control necessary to investigate complex relationships and is appropriate for exploring the theory of SCL. This section first explains the simulation context presented to participants and then describes the sampling plan and data collection methods proposed for testing the theory of supply chain leadership. Both sampling and data collection are accomplished within the boundaries of the simulated supply chain environment.

### **Simulated Environment**

“Simulation refers to a broad collection of methods and applications to mimic the behavior of real systems” (Kelton, Sadowski, and Sadowski 1998, p. 3). Simulation is a tool available to researchers that may provide the most realistic analysis of problems

**Figure 3.1: Supply Chain Leadership Structural Model**

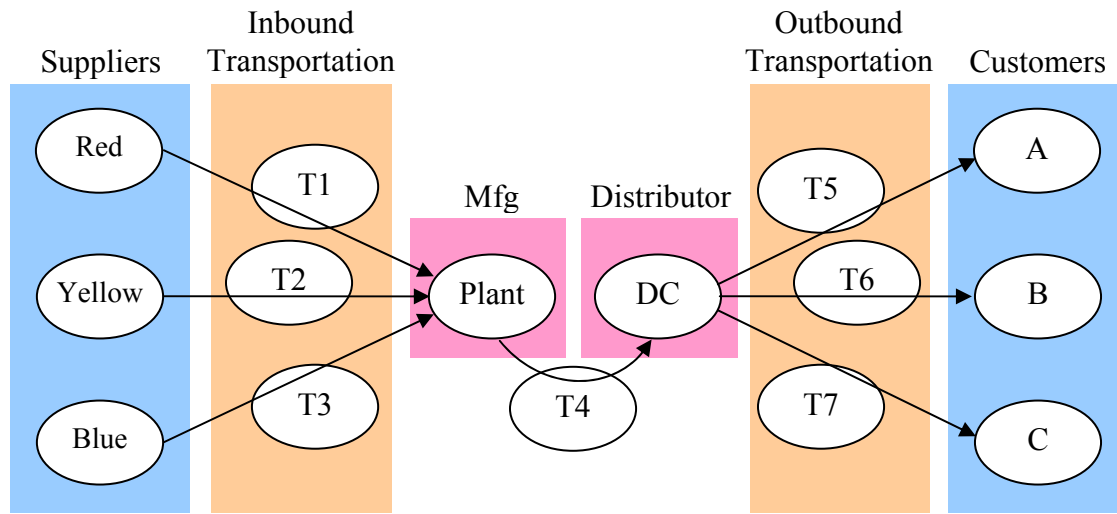




(Mentzer 1989). A frequently used type of simulation is *analytical* (Bowersox and Closs 1989), or *logical* (Kelton, Sadowski, and Sadowski 1998). This class of simulations uses numerical analysis to develop a near-optimal solution to a problem of interest when mathematical optimization techniques are too difficult to achieve. Computer simulations are found under this category. Another type of simulation is the use of *iconic models* (Kelton, Sadowski, and Sadowski 1998) to produce a physical replica of a system. A flight simulator is an example of this category of simulation. The beer game is another example of this type of simulation that has seen extensive use within the logistics discipline. Iconic modeling is the type of simulation used in this dissertation.

The Supply Chain Value game (Stank 2003) provides the simulated supply chain environment. The game has become an integral part of supply chain executive education courses taught at several major universities in the United States since its development in the mid-1990s. In the game, each participant is assigned a role in one of multiple organizations in a supply chain. Each organization is responsible for a supply chain function such as raw materials supplier, inbound logistics, manufacturing, warehousing, outbound logistics, and end-customer. The structure of the game and participant roles are highlighted in Figure 3.2. A typical game involves three suppliers, up to seven transportation companies, one manufacturer, one distributor, and three end-customers. The manufacturer and distributor organizations are comprised of multiple roles. The game can be adjusted to accommodate as few as 12 to more than 30 participants. The game requires two separate runs, and is generally completed in approximately four hours. More information about the conduct of the game is covered later in this chapter.

**Figure 3.2: Supply Chain Value Game Structure**



### Sample

The intent of this dissertation is to gain a greater understanding of inter-organizational supply chain phenomena, specifically the role of SCL and SCF on supply chain structural and performance outcomes. Therefore, targeted participants are experienced managers and executives currently occupying positions that contain significant supply chain content. The unit of analysis is an organization within a supply chain network. Each participant assumes the role of an organization in a supply chain, as explained above. Responses are assessed by measuring each participant's evaluation of the model variables in the context of the behaviors observed across all the other organizations in the supply chain environment. Specifically, participants are asked to identify the supply chain leader in the simulated supply chain which may or may not be their own organization, and then answer questions about the supply chain leader, and their own role as a supply chain follower (if the participant does not consider him/herself

to be the leader). The structure of the simulation does not influence participants to select any specific company as the leader. The determination of the leader is based solely on each participant's experience within the simulation.

Knowledge of supply chain activities and success criteria is an important characteristic of participants. Including participants in the simulation that do not have experience with supply chain relationships could cause serious validity questions for any results, since unknowledgeable participants may react in arbitrary ways. Therefore, the participants are drawn from executive education courses conducted at the University of Tennessee and from a customized executive education module delivered to a sponsor firm of the University of Tennessee Supply Chain Management and Strategy Forum. Participants in both settings are almost exclusively experienced managers and executives that have a supply chain-oriented role in their own organization. Typical positions held by participants include purchasing manager, merchandising manager, logistics manager, manufacturing planning and scheduling manager, transportation planning manager, traffic manager, and other roles found in the supply chain environment. Professionals in these and similar positions are preferred because they are expected to possess a higher degree of knowledge concerning supply chain phenomena than their peers in administrative support functions (e.g., human resources, finance and accounting).

The planned sampling frame should include participants from a broad range of industries, and organizations from multiple supply chain echelons. The nature of the executive education courses used should provide a significant cross-section of participants. Work history information is captured from each participant to provide

insight into the depth of their supply chain experience. This is important in terms of external validity (Cook and Campbell 1979) and generalizability of findings.

### **Approach to Data Collection**

Supply chains are acknowledged as consisting of three or more organizations (Mentzer 2001). Despite this view, research into supply chain phenomena has been primarily single-firm or dyadic in nature. Very little research has been published that attempts to capture the complexities of three or more companies working together. The use of an experimental design incorporating participative simulation selected in this dissertation is an appropriate method for incorporating the complexity of multiple organizations interacting in a common supply chain environment.

Experimentation is a common research method found throughout both the physical and behavioral sciences. Experimental designs are appropriate for testing theory because they provide control over the variables of interest, and the precision afforded by an uncontaminated, less “noisy” environment contributes to relatively high internal validity of the results (Kerlinger and Lee 2000). The manipulation used in this dissertation is the presence or absence of precise customer order information. This is described in more detail in the following paragraphs.

The simulation consists of two separate runs. Each run includes seven decision periods, each three minutes in length. During each run the participants attempt to optimize performance based on the conditions presented within that scenario. In the initial run participants are provided little guidance on how best to deal with other supply chain members, other than an overview of the responsibilities of each entity. No information is provided to members concerning overall supply chain goals or order

characteristics. Customers place large or small orders based upon random selection criteria (i.e., cards with order values are sorted prior to beginning the simulation and drawn throughout the game by customer participants). Customer orders are placed once per decision period, and all supply chain entities must react within that time frame. The arbitrary ordering patterns drive production, shipment expediting, and inventory level decisions across each of the upstream members. Order quantities are passed upstream from customers to the distribution center, and forecasted quantities drive manufacturing, materials management and procurement activities.

In the first run, participants at each echelon only understand order patterns as they are presented to them by the participant at the next downstream echelon or by forecast-driven plans. Past research has established that when order information is passed up a supply chain in this “staged” manner the information is subject to distortion (Watson and Zheng 2005). This phenomenon is referred to as *the bullwhip effect* and results in the growth of inventory at each stage in the supply chain as each organization adds its own estimate of safety stock to actual customer ordering levels. Performance is gauged at the end of the run by quantifying inventory level trends, the percentage of expedited shipments, and the percentage of perfect orders (i.e., right product, right quantity, on time, with no defects or damage) for the total supply chain.

The second run follows the first using the same rules and random end-customer ordering patterns, but additional information is provided to all members concerning the precise number and size of customer orders placed. This is accomplished by projecting actual order quantities on a screen visible to all participants as each customer order is

captured. This immediate sharing of customer order information is the key factor differentiating run 1 from run 2.

Participants are given a questionnaire to complete at the end of each run. The questionnaire is designed to tap each of the variables found in the structural model presented in Figure 3.1. The 10 first-order variables that form the second-order SCL and SCF constructs are anticipated to consist of three-to-six item scales. The four supply chain structural elements examined -- information availability, communication, decision-making, and rewards -- are each also expected to utilize three-to-six item scales. Performance values will be captured directly from the simulation outcomes. Efficiency is measured by the percentage of expedited orders at the end of each run. Effectiveness is measured by the percentage of perfect orders at the end of each run.

## **MEASUREMENT DEVELOPMENT**

Before measures can be developed, the constructs of interest must first be operationalized. The elements of each construct have been developed in chapter 2 based upon the extant literature. Each of the constructs uses multi-item measures in order to increase reliability, decrease measurement error, provide greater distinction across participant responses, and minimize the specificity associated with each item when multiple items are averaged (Churchill 1979). A range of three-to-five items is recommended per construct to effectively measure it and analyze it using structural equation modeling (Anderson and Gerbing 1988). For pre-testing purposes the initial item pool is substantially larger. This section explains the development of each of the 14 perceptual scales and the objectively obtained performance measures.

### **Scale Availability**

Adaptations of measures introduced in the Multifactor Leadership Questionnaire (MLQ) Form 5X (Avolio and Bass 2004) serve as the primary source of items for the five dimensions of SCL. This version of the MLQ provides five items per dimension. A few items were also identified from an earlier version of the MLQ, Form 5R (Bass and Avolio 1990). Additional items that have been identified in previous research as highly valid and reliable have also been included (Tejeda, Scandura, and Pillai 2001). Several of the SCF items were developed from a questionnaire developed by Kelley (1992). Although several articles have been published that address aspects of supply chain structure, no scales were found that tap the constructs of supply chain information availability, communications, decision-making, and rewards exactly as they are defined in this investigation. Several items, however, were adapted from pre-existing scales. These include previous attempts to capture logistics quality and flexibility (Fawcett, Stanley, and Smith 1997), formal and informal communication (Li and Dant 1997; Menon, Jaworski, and Kohli 1997; Mohr, Fisher, and Nevin 1996), organizational centralization (Williams 1994), and centralization of authority and rewards (Mollenkopf, Gibson, and Ozanne 2000). The remaining items used to assess these constructs were developed by the author as described below.

### **Construct Operationalization and Development**

Existing (adapted) measures were augmented by the creation of up to six new items for each construct based on the operationalized construct definitions to develop a pool of items for subsequent review and evaluation during the pre-test. Item development followed the methods suggested by Churchill (1979), Dunn, Seaker, and

Waller (1994), Mentzer and Kahn (1995), and Mentzer and Flint (1997). The goal of item development was to ensure each item tapped the domain of the construct (Mentzer and Flint 1997) and was not vague or ambiguous (Dillman 2000). As the questions were created to measure participants' views of supply chain leader and follower behaviors, a Likert scale was used to quantify responses (DeVellis 1991). A 5-point scale was selected for all measures to conform to the format utilized by the MLQ.

The pool of items was reviewed by six subject matter experts who evaluated the items in terms of item specificity, representativeness, readability, and face validity. Based on the experts' feedback, several items were dropped and others were reworded to more closely capture the precise meaning of each construct. Once this step was complete, a draft of the pre-test survey was developed and reviewed by four mid- and senior-level supply chain managers and two additional subject matter experts. The manager's comments concerning item specificity, representativeness, readability, and face validity resulted in the elimination of four items and minor rewording of three items. The final set of items used in the pre-test instrument is presented in Appendix A. The source of each item is shown in the appendix, along with a notation of whether the item is reworded from its original source (i.e., adapted rather than adopted), and if the item is reverse coded. The final version of the instrument used in the pre-test was assembled using the input provided by the eight subject matter experts and four supply chain managers. The pre-test survey instrument is also included in Appendix A. Definitions of each first and second-order construct are presented next.



### *Supply Chain Leadership*

SCL occurs within a co-influencing relationship between a supply chain leader and one or more supply chain follower organizations. SCL accrues to *the organization able to exert the greater influence over other supply chain members in order to increase follower compliance with and commitment to the leader's vision for the entire supply chain*. SCL is a formative construct determined by the three dimensions of transformational leadership and two dimensions of transactional leadership described in Chapter 2, each operationalized below. The intent of the construct is to classify supply chain leader organizations along a transformational-transactional continuum. The majority of measures used in the pre-test were adapted from the MLQ Forms 5X and 5R (Avolio and Bass 2004; Bass and Avolio 1990).

### *Inspirational Behavior*

Inspirational behavior (IBL) occurs when *the supply chain leader serves as a role model by espousing important values, beliefs and a sense of mission to supply chain followers*. It is operationalized as supply chain manager perceptions of the supply chain leader's role modeling behaviors. In the pre-test questionnaire IBL is represented by 10 items. The questions tap multiple components of supply chain leader behavior, including providing a clear sense of purpose through the articulation of the vision of a desirable future, defining a path for achieving that future, and setting high performance expectations.

### *Intellectual Stimulation*

Intellectual stimulation (ISL) occurs when *the supply chain leader helps followers become more creative and innovative by getting them to question accepted methods of*

*solving problems*. It is operationalized as supply chain manager perceptions of the supply chain leader's ability to get supply chain followers to question the methods they use and improve upon them with creative and innovation ideas. In the pre-test questionnaire ISL is represented by eight items. The questions reflect supply chain leader behaviors that encourage and assist followers to break from past ways of doing things and seek innovative approaches to improve supply chain performance. The encouragement aspect of ISL is found in questions asking about the supply chain leader's support of followers expressing new ideas and opinions, and challenging the status quo. The assisting aspect of ISL is found in questions about the supply chain leader's suggestions to, and interactions with, followers that result in creative solutions.

#### *Individualized Consideration*

Individualized consideration (ICL) occurs when *the supply chain leader pays attention to the unique developmental needs of each supply chain follower, mentors followers in the learning process, and provides opportunities to contribute that stress special follower skills or ensure follower development*. It is operationalized as supply chain manager perceptions of supply chain leader behaviors that demonstrate the ability to treat followers distinctly, help followers develop necessary skills to contribute to supply chain success, and acknowledge and utilize follower's special abilities. In the pre-test questionnaire ICL is represented by nine items. Questions tap supply chain leader behaviors exhibiting the ability to treat each supply chain member as a separate entity with distinct abilities and developmental needs.

### *Contingent Reward*

Contingent reward (CRL) occurs when *the supply chain leader clarifies follower behavior and task performance required for a reward to be received*. It is operationalized as supply chain manager perceptions of supply chain leader communication intended to clarify rewards and/or punishments associated with follower behavior and performance. In the pre-test questionnaire CRL is represented by nine items. The questions reflect the supply chain leader behaviors that clarify follower responsibilities, goals, and performance consequences.

### *Management-by-Exception*

Management-by-exception (MEL) occurs when *the supply chain leader monitors follower performance and takes corrective action when the follower fails to achieve established standards*. It is operationalized as supply chain manager perceptions of supply chain leader performance monitoring and corrective action behavior. In the pre-test questionnaire MEL is represented by nine items. Questions reflect the supply chain leader's attention to follower mistakes and failures.

### *Supply Chain Followership*

SCF occurs within a co-influencing relationship between a supply chain leader and one or more supply chain follower organizations. SCF is found in organizations capable of less influence than the supply chain leader, in *which the supply chain follower exhibits proactive inter-organizational behaviors intended to help the extended supply chain achieve its goals*. SCF is a formative construct determined by the five dimensions of transformational followership described in Chapter 2, each operationalized below.

The intent of the construct is to classify supply chain follower organizations along a transformational-transactional continuum. The majority of measures used in the pre-test were adapted from the Followership Style Questionnaire (Kelley 1992).

### *Independent Mindset*

Independent mindset (IMF) behavior occurs when *the supply chain follower maintains the integrity of its own important value set and does not accept supply chain leader directions in conflict with its own values*. It is operationalized as supply chain manager perceptions of supply chain follower ability to consistently demonstrate behaviors aligned with its own set of important values. In the pre-test questionnaire IMF is represented by eight items. The questions tap supply chain follower behaviors that demonstrate independent thinking such as questioning the supply chain leader's wisdom rather than accepting the leader's direction without reasonable justification, and acting from the basis of its own values and beliefs.

### *Critical Thinking*

Critical thinking (CTF) occurs when *the supply chain follower takes action without need for direction, designs creative solutions to unforeseen problems, and actively participates in change activities*. It is operationalized as supply chain manager perceptions of supply chain follower ability to take action on its own initiative, develop creative solutions, and champion change throughout the supply chain. In the pre-test questionnaire CTF is represented by nine items. The questions tap multiple components of supply chain follower behavior including the ability to identify critical supply chain

activities without supply chain leader direction, developing new ideas that contribute to supply chain performance, and active participation in supply chain change initiatives.

#### *Assume Responsibility*

Assuming responsibility (ARF) occurs when *the supply chain follower makes sound business decisions that benefit the entire supply chain, demonstrates high in-role performance, and enthusiastically takes on extra-role tasks*. It is operationalized as supply chain manager perceptions of supply chain follower ability to demonstrate in-role task competence, and willingness to take on extra-role tasks. In the pre-test questionnaire ARF is represented by 10 items. Questions targeting the in-role aspect of supply chain follower behaviors reflect the importance of building a track record of success, making sound business decisions, meeting supply chain deadlines, and honestly assessing its own strengths and weaknesses. Questions targeting the extra-role aspect of supply chain follower behaviors reflect the creation of new capabilities, willingness to accept difficult assignments, and seeking out assignments beyond the scope of its current role.

#### *Collaborating with Supply Chain Members*

Collaboration (COF) with supply chain members occurs when *the supply chain follower develops a network of relationships including the supply chain leader and other members, seeks outside expertise when it's own knowledge is limited, and strives to accomplish mutually defined supply chain goals*. It is operationalized as supply chain manager perceptions of supply chain follower ability to develop relationships with other supply chain organizations, utilize outside expertise as needed, and target supply chain goals developed with the supply chain leader. In the pre-test questionnaire COF is

represented by eight items. Questions tap the supply chain follower's ability to create and develop relationships with the supply chain leader and other members, call on other members to supply expertise as needed, and achieve supply chain goals.

#### *Supply Chain Commitment*

Supply chain commitment (CMF) occurs when *the supply chain follower establishes a shared purpose with the supply chain leader and challenges the leader when its decisions stray from mutually-held supply chain goals*. It is operationalized as supply chain manager perceptions of supply chain follower ability to establish a shared purpose with the supply chain leader and willingness to challenge the leader when decisions stray from goals. In the pre-test CMF is represented by eight items. The shared purpose aspect of CMF is found in questions asking about the supply chain follower's ability to create and achieve mutually-defined goals with the supply chain leader. The challenging the leader aspect of CMF is found in questions asking about the supply chain follower's willingness to oppose the supply chain leader.

#### *Information Availability*

The information availability (INF) construct is defined as *the degree to which information is available to effectively support supply chain activities*. It is operationalized as supply chain manager perceptions of information availability in the supply chain. In the pre-test INF is represented by eight items. Questions tap supply chain member access to information necessary to respond to customer requests, handle unexpected events, plan supply chain tasks, and control operating costs. Three of the pre-

test measures were adapted from Fawcett, Stanley, and Smith's (1997) logistics quality and logistics flexibility scales.

### *Communication*

Communication (COM) is *the degree to which formal versus informal communications mechanisms are used to send and receive information between supply chain members*. It is operationalized as supply chain manager perceptions of the supply chain leader's use of formal versus informal communication methods. In the pre-test COM is represented by eight items. The questions reflect the degree of informal versus formal communications found between members in the supply chain. Three of the pre-test measures are adapted from previously published communication formality-related scales (Li and Dant 1997; Menon, Jaworski, and Kohli 1997; Mohr, Fisher, and Nevin 1996).

### *Decision-Making*

Decision-making (DEC) is *the degree to which control for planning and decision-making is kept by the supply chain leader versus being distributed to many supply chain members*. It is operationalized as supply chain manager perceptions of the supply chain leader's control over decision-making versus the sharing of decision-making with supply chain followers. In the pre-test DEC is represented by seven items. Questions tap the degree of centralized versus decentralized decision-making present in the supply chain. Four of the pre-test measures are adapted from previously published centralization scales (Mollenkopf, Gibson, and Ozanne 2000; Williams 1994).

### *Rewards*

Rewards (REW) are *the degree to which compensation is distributed to supply chain members based upon firm-centric versus holistic supply chain goals and performance*. It is operationalized as supply chain manager perceptions of performance goals as primarily firm-centric or holistic. In the pre-test REW is represented by eight items. The questions tap the degree of firm-specific versus holistic reward structures present in the supply chain. Four of the pre-test measures are adapted from Mollenkopf, Gibson, and Ozanne's (2000) reward systems scale.

### *Performance*

Supply chain holistic performance is determined by the efficiency and effectiveness that supply chain activities are accomplished. It is operationalized through the dimensions of supply chain efficiency and supply chain effectiveness as measured at the supply chain-wide level. In the simulation, efficiency is measured objectively by calculating the percentage of total shipments requiring expediting, and effectiveness is measured objectively by calculating the percentage of perfect orders.

### **The Survey Instrument**

The survey instrument is designed to be easily understood by participants. Prior to administering the survey, the primary researcher explains the purpose of the instrument to the participants as a group. The concept of supply chain leadership is clarified as *the company in the simulation run just completed that most influenced the actions of other companies*. This is done to ensure participants each begin with a similar frame of reference concerning the core construct of interest. At this point it is also explained that



identification of the supply chain leader is completely based on the participant's experience in the simulation run just completed, and that responses should be based entirely on the behaviors they saw take place in the context of the simulation. Any questions presented by participants about the survey are answered by the primary researcher and the survey is distributed.

An initial set of instructions at the top of the first page reinforces the purpose of the survey and describes the roles found in the simulation and the response context as being contained within the simulation itself (see pre-test survey in Appendix A). Questions are presented in a non-threatening and logical order to limit confusion (Bradburn and Sudman 1978). The pre-test survey contains four sections. Section 1 asks the participant to identify the supply chain leader using a graphical representation of the simulated supply chain as shown in Figure 3.2. Sections 2-4 each begin with transitional headers to assist the participant in maintaining a clear sense of each question set (Dillman 2000), and describe the questions as pertaining to supply chain leader behaviors (Section 2), supply chain follower behaviors (section 3), or general characteristics of the supply chain (Section 4). A fifth section is added to the final survey to collect demographic data for classification purposes (not included in the pre-test instrument).

The pre-test survey contains 119 items divided across the 14 first-order constructs as described in the previous section, with each construct represented by between 7-10 items. SCL contains 45 items, SCF contains 43 items, and the remaining 31 items target the four supply chain structural constructs.

## **PRE-TESTING**

A pre-test is necessary for four purposes. As described previously, the leadership and followership items are placed within a new context in this dissertation. The SCL and SCF constructs target organizational-level rather than the managerial-level behaviors. Thus, the first purpose of the pre-test is to validate the adapted and newly developed measures of the survey instrument. The second purpose is to identify any potential problems with the design and administration of the survey. The survey is being explained and delivered personally by the primary researcher to each participant at the conclusion of each simulation run. This approach is intended to provide a clarity of purpose for participants not available from impersonally administered mail and internet surveys. The third purpose is to understand the impact of the survey on the executive education event being delivered. The addition of the survey cannot interrupt the flow of the training or force the trainer to short-cut important material in order to create time in the schedule for survey administration. The fourth purpose is to identify any potentially biasing aspects of the executive education course that might lead participants to respond to the survey in a predetermined way.

The pre-test will be administered to a group of undergraduate and graduate students from the College of Business Administration at The University of Tennessee. The four purposes of the pre-test make this a logical and useful sample. Students provide a convenient group to sample. It has been established in previous studies that college-age students generally mirror the general population (Browne and Brown 1993), differ from professional managers only slightly, and findings of studies using students may be extrapolated to managers in certain situations (Höst, Regnell, and Wohlin 2000). As the

interest in using students in this case is to support the testing of the items and the administration of the survey within the simulation context, rather than generalization of findings, college students appear to be an appropriate sample for the pre-test.

Business school students are targeted because they will have become familiar with basic supply chain concepts through course activities. Importantly, the survey is designed to capture participant's experiences occurring *within the context of the simulation*. Real-world supply chain experiences are not required to meet this standard. The students considered for the pre-test must pass a basic knowledge screen by demonstrating an understanding of supply chain concepts to ensure their behaviors in the simulation are appropriate. The logistics of conducting the simulation requires the presentation of the entire four hour executive education course. An optimal experience necessitates the simulation be limited to between 20-30 participants. A large pre-test sample is not anticipated, and one simulation event of 25-30 participants is planned.

Once the pre-test has been completed, the survey responses will be entered into SPSS version 14 for analysis. The surveys will be examined for basic respondent errors such as providing more than one response to an item, or obvious non-random response patterns. Missing data analysis will be conducted to highlight potential problems with the questionnaire. Missing data will be reviewed for each respondent and each item. When a large amount of missing data exists, that respondent or item will be eliminated from the sample. In the event that missing data is centered on many items that comprise a specific construct, the simulation context may need to be reviewed.

A large amount of missing data for an individual item may suggest a specific behavior is not brought out in the simulation. The extreme case of multiple items

associated with a single construct containing significant missing data may suggest a broader group of behaviors is not facilitated by the simulation. In either case, the item(s) or construct will be examined and may have to be eliminated from the model. Alternatively, the simulation may have to be altered to allow the behaviors of interest to more easily surface. Otherwise, the data will be analyzed to ensure the missingness is random.

Pre-test participants will be asked to circle the question number of any item they cannot answer based on their experience in the simulation. This step may help to more clearly identify items that are not answered because certain behaviors were not perceived versus items that may have been skipped unintentionally. Additionally, at the conclusion of the second simulation run, participants will be questioned by the primary researcher to identify specific elements of the survey and the simulation environment that they considered to be contrived or confusing. This direct feedback should augment the missing data analysis and the researcher's own conclusions concerning the simulation context and allow the final form of the questionnaire and presentation of the simulation to better target the intended constructs.

### **Scale Purification**

The purpose of the scale purification process is to satisfy the remaining sub-dimensions of construct validity including unidimensionality, reliability, convergent validity, and discriminant validity (Garver and Mentzer 1999). Content validity has been previously discussed in the Construct Operationalization section. Each of the constructs will be tested for *unidimensionality* to confirm the existence of only one latent construct underlying a set of measures (Hattie 1985). Confirmatory factor analysis will be used for

testing unidimensionality because it has been shown to provide a more rigorous interpretation than other available methods including exploratory factor analysis, item total correlations, and coefficient alpha (Gerbing and Anderson 1988). *Internal consistency reliability* will be assessed using Cronbach's coefficient alpha (Cronbach and Meehl 1955). Alpha values above a .7 cutoff are sought for all variables as that level suggests good correlation between the item and true scores, while lower alpha values indicate the item set does a poor job of capturing the construct of interest (Churchill 1979; Nunnally and Bernstein 1994). Because the data will be collected and compared across two runs of the simulation it is imperative that a common set of items are judged to be reliable within each run. To support this requirement independent reliability analyses will be performed for each run, and the most reliable set of items found in the data sets of both runs will be selected. In the event a sub-set of items representing a construct does not perform reliably across both runs new items will have to be developed and additional pre-test data collection will be required.

Convergent and discriminant validity will be evaluated using the process outlined by Garver and Mentzer (1999). The overall fit of the measurement model, and the magnitude, direction, and statistical significance of the estimated parameters between the latent variables and their survey items is used to assess convergent validity. A value of .7 or greater of substantial magnitude of the parameter estimate is desired to indicate convergent validity exists. Discriminant validity will be examined by comparing paired construct correlations. A chi-square test will be used to test for differences between the measurement model constructs and the theoretical model constructs. It is anticipated the approach delineated above will result in the elimination of several items.

## **FINAL DATA COLLECTION AND ANALYSIS**

The survey and presentation of the simulation context should be greatly improved by the pre-test feedback and data analysis. The final survey should contain a reduced set of items, making it more concise and user friendly (Dillman 2000). The subject matter experts suggested adding a construct unrelated to those found in the theory of SCL to test for multitrait-multimethod bias (MTMM). Therefore, the final version of the survey instrument will include the four-item opportunism scale developed by Moore and Cunningham (1999). Opportunism is not directly related to the constructs of interest in this dissertation and should serve as an adequate test for bias.

A series of executive education seminars scheduled for summer and fall 2006 are proposed to provide the required sampling frame and number of responses needed to support the final analysis. It is estimated that 200-300 participants, each completing two surveys (one per simulation run), will be required to generate an adequate number of responses to ensure statistical power and provide the degrees of freedom necessary to evaluate the structural model. The ultimate value of N will be determined after the number of items in the survey is again refined through reliability analysis of the final sample data. A rule of thumb suggests 4-5 responses are needed for each construct-item combination (Hair et al. 1998). For example, with 14 constructs and an estimated 4 items per construct, 224-280 participants will be required in the final sample ( $14 \times 4 \times 5 = 280$ ).

Structural equation modeling (SEM) will be used to perform the data analysis on the final sample. AMOS 5 is the statistical tool chosen to support all SEM analysis in this dissertation. SEM combines the measurement model and the structural model into a simultaneous test, is useful in testing logistics theory, and carries several advantages over

traditional statistical methods (Garver and Mentzer 1999). The two-step approach advocated by Anderson and Gerbing (1988) will be followed in this dissertation. Confirmatory factor analysis is used in the first step to validate the measurement model and to test for construct validity through examining unidimensionality, reliability, convergent validity and discriminant validity as described in the Scale Purification section. In line with past recommendations (Medsker, Williams, and Holahan 1994), predictive validity will also be examined in step one.

The structural relationships found between the latent variables will be tested in step 2 using the path analysis capabilities built into SEM. The theoretical model is tested in this step including an assessment of nomological validity. This is accomplished by comparing the fit of the theoretical model to alternative models developed within the AMOS software. Differences in transformational versus transactional SCL and SCF are tested by statistically comparing the path models and significant path weights resulting from the two runs. The theory of SCL anticipates run 1 will result in more transactional outcomes and run 2 will find more transformational outcomes across all model constructs. The presence and strength of these differences will serve to confirm the hypotheses developed in chapter 2.

## **Summary**

This chapter has explained the process to be used in this investigation including the overall research design, measure development, scale purification, data collection, and data analysis approach. An experimental design using a participant-driven simulation context is the research method chosen. Data analysis will be conducted using SEM.

## **CHAPTER 4 – ARTICLE 1: UNDERSTANDING SUPPLY CHAIN LEADERSHIP**

A central area of research over the past decade has been the description of Supply Chain Management (SCM) and explanation of the benefits available to firms wanting to compete on the basis of superior SCM capabilities (Bowersox, Closs, and Stank 1999; Christopher 2005; Lambert, Cooper, and Pagh 1998; Mentzer 2004). Less emphasis has been given to an important prerequisite of any SCM initiative: Supply Chain Leadership. The implementation and acceptance of SCM techniques requires leadership that spans the boundaries of multiple firms. Supply chains risk devolving into a state of chaos unless an organization steps forward to assume responsibility for strategic supply chain decisions by taking on the leadership role (Lambert, Stock, and Ellram 1998).

The notion of an organization becoming the supply chain leader has its roots in earlier descriptions of channel leaders (Etgar 1977). Supply chain leaders differ from channel leaders along three dimensions. The first concerns the view of power. Both channel leaders and supply chain leaders *may* possess greater power than other members (Gaski and Nevin 1985; Lusch and Ross 1985; Maloni and Benton 2000). Power is a defining characteristic of channel leaders (Gaski 1984), and organizations are not described as leaders in a channels perspective without possessing a base of power. An organization may become the supply chain leader because of its disproportionate power, but superior performance is more often tied to tighter integration (Bowersox, Closs, and Stank 1999; Stank, Keller, and Closs 2001) and collaboration among organizations (Mentzer 2004; Stank, Keller, and Daugherty 2001).

Second, the unit of analysis should be considered. Emphasis in marketing channels is directed toward a single focal firm, often an upstream manufacturer. In this



regard, channels theory tends to favor maximizing the outcome for the focal firm with less concern for how the channel leader's behavior may negatively impact other channel members. Supply chains are increasingly viewed as holistic enterprises that span the boundaries of multiple organizations (Holmberg 2000). Greater consideration of the potential negative impacts of leader behavior on other members is becoming part of the discussion in supply chains (Mentzer 2001).

The third dimension is found in the greater importance placed on control for channel leaders. Channels theory describes the ability of the channel leader to exercise its power to assert control over other channel members (Gaski and Nevin 1985). Control is essential to the channel leader's ability to dictate terms to members (Etgar 1977) and may lead to conflict with member organizations (Cadotte and Stern 1979; Etgar 1979). The focus on control limits the perception of channel leaders to arms-length, transactional relationships. The greater emphasis on collaborative relationships (Mentzer 2004) and strategic alignment across members (Defee and Stank 2005; Stank, Davis, and Fugate 2005) grants supply chain leaders the freedom to develop longer-term, mutually beneficial relations with members. The differences found between conceptualizations of channel leaders and supply chain leaders suggest that the concepts differ significantly.

The concept of supply chain leadership is found frequently in the literature. Unfortunately, the term suffers from inconsistent use and lack of a precise definition. *Supply chain leader* is found as a title given to a firm that outperforms industry competitors (Harrison and New 2002), a source of industry best practices (Byrne 2004), and individuals as thought leaders in the discipline (Fawcett and Magnan 2004). A typical description of supply chain leadership equates the leader's role with the most

powerful, dominant firm in a supply chain (Maloni and Benton 2000). Current theories suggest the domain of leadership is much broader (Graen and Uhl-Bien 1995; Hogg, Martin, and Weeden 2003) and purely power-based conceptualizations are outdated.

The purpose of this research is to explore and better understand leadership in supply chains. A clear, theoretically grounded definition of supply chain leadership (SCL) is needed. Additionally, the impact of SCL style on performance has not been studied. Three research questions address these gaps. First, how to define leadership within the inter-organizational context of supply chains? The domain of SCL is described in this research and a definition of the concept is offered. The intertwined concept of supply chain followership (SCF) is introduced to expand the domain of leadership and consider the wider network of firms that make up a complete supply chain. Second, can supply chain leader organizations be identified on the basis of the behaviors they project? Transformational leadership theory (Bass 1985a) is used to classify SCL behaviors as being transformational or transactional. Third, do differing supply chain leadership styles drive different structural and performance outcomes in supply chains? Strategy-structure-performance theory (SSP) (Chandler 1962; Rumelt 1974) has been suggested as an excellent theoretical lens through which supply chain phenomena may be viewed (Bowersox, Closs, and Stank 1999; Chow, Henrikssen, and Heaver 1995). SSP provides the foundation for the theory of supply chain leadership.

A brief review of relevant literature and concepts is presented initially, followed by development of the model and supporting hypotheses. Data collection and analysis using structural equation modeling is described, and implications of the findings and directions for future research are outlined. Important contributions of this inquiry include

the development, refinement, and verification of valid and reliable scales of supply chain leadership and supply chain followership.

## **LITERATURE REVIEW**

This section provides a review of the literature from the leadership field with a focus on the transformational leadership paradigm, writings on the concept of followership, and strategy-structure-performance theory.

### **Views of Leadership and Followership**

Leadership has been routinely found to be an important contributor to organizational success (Bass 1990; Yukl 2001). As much as 45% of firm performance results have been attributed to leadership (Day and Lord 1988). Leadership has been linked to organizational learning (Vera and Crossan 2004) and innovation (O'Regan, Ghobadian, and Sims 2006), and is viewed by many as a strategic source of competitive advantage (Waldman et al. 2001). Dozens of theories of leadership have been proposed (Yukl 2001). The earliest tend to be leader-centric, emphasizing the special qualities, traits, or behaviors distinguishing leaders from non-leaders (Hunt 1999). More recently, theories of leadership have taken an increasingly holistic, relationship-oriented view that reflect the perspective of both the leader and the follower (House and Aditya 1997), and grant followers the ability to influence the leader (Kouzes and Posner 2004).

Consistent with the more recent views, leadership is considered simply as the *process of influencing* individuals or groups to achieve group goals (Hoyt and Blascovich 2003). In addition to influence, leaders must be *identifiable* and readily distinguished from followers on the basis of the behaviors they project (Shamir 1999). Leaders form and articulate a *vision* of the future (Richards and Engle 1986), often highlighting the

need for significant change to occur (Schein 1992). Leaders cannot exist without a group of followers (Hollander 1993). Leaders and followers form a co-influencing *relationship* (Kouzes and Posner 2004) that is strongest when targeting a set of *shared goals* (Hogg, Martin, and Weeden 2003). Summarizing these concepts, the definition used in this research is: *Leadership is a relational concept involving the leader and one or more followers that interact in a dynamic, co-influencing process. Leaders strive to understand the needs and goals of followers, form and effectively communicate a vision of the future, and project behaviors consistent with achieving the long-term objectives of the organization. Each of these actions reinforces and motivates followers.*

Leadership is important, but the majority of work performed in organizations is a direct result of the contributions of followers (Kelley 1992). Put another way, followership dominates organizations (Dixon and Westbrook 2003). The term follower generally carries a negative connotation as a weak, conforming individual that must be told what to do (Banutu-Gomez 2004). Relationship-oriented theories of leadership strip away this view and position followers as critical contributors to the success of the organization (Kouzes and Posner 2004). Followership in this context identifies proactive, value-added behaviors performed by non-leaders that differentiates exemplary high contributors from passive low contributors (Potter, Rosenbach, and Pittman 2001).

Followers should not be confused with subordinates. Effective followers have been characterized as acting with integrity based on their own set of beliefs (Lundin and Lancaster 1990), partnering with leaders to attain shared goals (Potter, Rosenbach, and Pittman 2001), and willingly challenging inappropriate leader behavior or any behavior that strays from mutually-held goals established between leaders and followers (Chaleff

2003). The value-adding follower is actively engaged and interested in expanding their relationship with leaders, and able to demonstrate critical thinking skills that may lead to the creation of novel solutions (Kelley 1992; Potter, Rosenbach, and Pittman 2001). Thus, the definition of followership used in this research is: *Followership is a relational concept between leader and follower in which the follower exhibits proactive behaviors to help the leader and the organization achieve goals so long as they are aligned with the vision, the follower's own goals, and long-term organization objectives.*

### **Transformational Leadership**

Transformational leadership has become the dominant paradigm in the field of leadership over the past twenty years (Bass 1999; Hunt 1999). The essence of transformational leadership is found in the leader's ability to transform the hearts and minds of followers to higher levels of motivation and performance than would be expected without the leader's influence (Bass 1985a; Jung and Avolio 2000). Transformational leaders are positioned opposite transactional leaders on a continuum, with the leader's behaviors determining whether the leader's style is more transformational or more transactional (Burns 1978). Transformational leaders articulate a vision of the future as a way to motivate followers to rise above their own individual self interests, focus on activities that benefit the group, and consider followers' long-term needs for development (Podsakoff et al. 1990; Wang et al. 2005). When follower goals are aligned with the vision, mutually-held goals are created and followers tend to be motivated to expend extra effort in pursuit of the vision (Humphreys and Einstein 2003).

Research has found three behaviors of transformational leaders that are not frequently found in transactional leaders (Avolio, Bass, and Jung 1999; Hater and Bass

1988; Howell and Avolio 1993). *Inspiration* is the leader's ability to define a clear sense of purpose through the articulation of a vision of a desirable future, defining a path for achieving the vision, and setting high performance expectations. *Intellectual stimulation* is defined as the leader helping followers become more creative and innovative by getting followers to question accepted methods of solving problems. *Individualized consideration* occurs when the leader pays attention to the unique developmental needs of each follower, assists in the learning process, and utilizes special follower skills. Leaders exhibiting transformational behaviors have consistently been found to be more effective than transactional leaders along multiple performance dimensions including overall organization performance (Zeffane 1994), quality of output (Hoyt and Blascovich 2003), bottom-line financial performance (Perry and Proctor 2000), and follower satisfaction and motivation (Bass and Avolio 1994a; Masi and Cooke 2000).

### **Leadership in Supply Chains**

The leadership literature describes the role individuals play as leaders and followers in groups, organizations, and societies. Leadership is also found in the macro context of inter-organizational relationships in supply chains. Leadership is necessary to coordinate the efforts of multiple supply chain firms (Bowersox and Closs 1996; Lambert, Stock, and Ellram 1998). While leadership is critical to supply chain success, supply chain leadership is not well understood. No theory exists to explain how a firm becomes the supply chain leader and maintains that role over time. Thus, no basis exists to predict supply chain outcomes influenced by SCL.

Power is unquestionably an attribute of SCL. However, a fundamental point of the theory of supply chain leadership is that power should not be considered the sole

antecedent of leadership in supply chains – a default view held by many. Organizational behaviors, skills, and capabilities may also provide for the emergence of a supply chain leader. Organizational *behaviors* can be seen in the policies, procedures, and standards established by firms and projected through the interactions of boundary spanning managers. A supply chain leader may emerge when it develops a distinctive capability that benefits other supply chain members, or SCL may accrue to a smaller, specially skilled firm when a particular expertise is lacking from an otherwise more powerful firm. For example, third party logistics providers may find themselves in a position of leadership because of the more efficient product flow processes they have developed.

The concept of SCL is described in line with the four elements of leadership presented previously. First, the essence of leadership in a supply chain is found in the ability of one organization to *influence the actions of another organization*. Second, the behaviors projected by the supply chain leader may be seen through its stated policies, and the actions of boundary spanning personnel. These behaviors allow the supply chain leader to be *identified and distinguished from follower organizations*. Third, the supply chain leader is the organization that *identifies the need for change and creates a vision for the future*. Fourth, SCL is a *relational* concept with both the supply chain leader and supply chain followers having the ability to influence the other (Graen and Uhl-Bien 1995; Grundstien-Amado 1999; Kouzes and Posner 2004). Thus, the definition of SCL is: *SCL is a relational concept involving the supply chain leader and one or more supply chain follower organizations that interact in a dynamic, co-influencing process*. The supply chain leader is characterized as the organization that demonstrates higher levels of the four elements of leadership in relation to other member organizations (i.e., the

organization capable of greater influence, readily identifiable by its behaviors, creator of the vision, and that establishes a relationship with other supply chain organizations).

### **Supply Chain Structure**

SSP theory suggests an organization's performance can be predicted from the relative alignment of its strategy and the structural elements developed to support the strategy (Galbraith and Kazanjian 1986; Rumelt 1974). Several authors have argued that strategy-structure fit is appropriate for examining networks of firms such as those found in a supply chain (Chow, Henrikssen, and Heaver 1995; Cooper, Lambert, and Pagh 1997; Stock, Greis, and Kasarda 1999). Integration between organizations is necessary to ensure supply chain processes are effective (Mentzer 2004), and supply chain structure is the mechanism through which integration occurs (Defee and Stank 2005).

Numerous elements of supply chain structure have been suggested, but few have been empirically examined. Supply chain structure has been described along dimensions such as formalization of norms and rules, centralization of authority, degree of vertical integration, and logistics capabilities (Chow, Henrikssen, and Heaver 1995; Stank, Davis, and Fugate 2005; Stock, Greis, and Kasarda 1999). Defee and Stank (2005) reviewed the supply chain SSP literature and summarized structure into five elements: technology integration, communications, standardization, decision-making, and rewards.

Three elements of supply chain structure are examined in this research. *Information availability* (analogous to Defee and Stank's technology integration element) has been identified as a significant contributor to supply chain success (Fawcett, Stanley, and Smith 1997; Mentzer 2004), and is classified as closely held by each organization or widely shared across organizations in the supply chain. *Communications* between



organizations supports relationship development and collaboration (Mohr, Fisher, and Nevin 1996), and is characterized as either formal or informal. *Rewards* are used to motivate both boundary spanning personnel and organizations to focus on achieving supply chain performance goals. Rewards are determined to be either firm-centric or holistically established across supply chain members. Two structural elements identified by Defee and Stank are not specifically included in the analysis. Standardization is viewed through the operational processes implemented across supply chain firms (Bowersox, Closs, and Stank 1999). Processes were determined to be exogenous to this research as the simulation (described subsequently) does not allow for that level of granularity. Decision-making is typically measured in terms of centralization versus decentralization (Mollenkopf, Gibson, and Ozanne 2000), and is manifested in this research through the depiction of SCL and SCF as transformational or transactional.

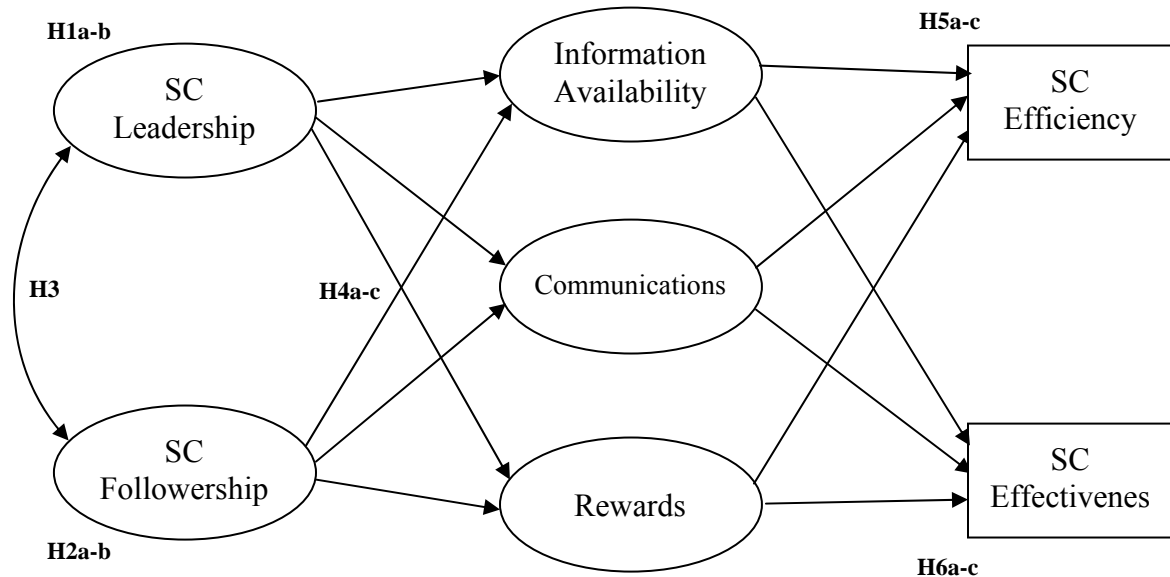
## **BUILDING THE MODEL**

The theory of supply chain leadership is shown as a structural model in Figure 4.1. Supply chain leaders and supply chain followers are posited to exhibit behaviors that tend to be transformational or transactional. The resulting leadership and followership styles are anticipated to lead to different structural and performance outcomes.

### **SCL Style Determination**

Supply chain leaders should be most effective when using more transformational behaviors (Bass 1999; Jung and Avolio 2000). Effective supply chain leaders should also encourage followers to establish mutually-held goals (Burns 1978), thus creating relationships that motivate supply chain followers to produce extra effort (Bass 1985a).

**Figure 4.1: Structural Model of Supply Chain Leadership**



The domain of transformational supply chain leadership is characterized by three types of behavior: inspiration, intellectual stimulation, and individualized consideration.

Transformational supply chain leaders provide inspiration by clarifying the purpose and mission of the entire supply chain and encouraging members to “buy-in” to the leader’s direction (Bennis 1983). This sense of purpose may be based solely on supply chain leader values deemed acceptable by followers, or a shared set of values identified between multiple members. Articulating a vision of an improved future supply chain environment is another important inspirational behavior. Transformational supply chain leaders provide intellectual stimulation by soliciting new ideas and challenging members to develop creative solutions to supply chain issues (Kouzes and Posner 2004). Supply chain leaders understand supply chain followers possess distinctive skills and have differing organizational goals. Approaching each relationship independently forms the foundation for individualized consideration behaviors (Sashkin and Burke 1990).

Transformational supply chain leaders know that some follower organizations require coaching to develop required capabilities, while other supply chain followers are already quite capable and want to take on new challenges (Avolio, Bass, and Jung 1999). Transactional supply chain leaders will not use inspirational, intellectual stimulation and individualized consideration behaviors consistently. Thus, hypothesis 1 is:

**H1a:** *Transformational supply chain leaders* exhibit higher levels of transformational behaviors, including greater use of inspiration, intellectual stimulation, and individualized consideration.

**H1b:** *Transactional supply chain leaders* exhibit lower levels of transformational behaviors.

### **SCF Style Determination**

Although followership has been found to be measurable (Dixon and Westbrook 2003), little theory has been offered to characterize followership behaviors. Using the definition of followership presented earlier, SCF style is classified as falling along a transformational-transactional continuum, similar to SCL. Four followership behaviors describe the domain of SCF: critical thinking, assuming responsibility, collaboration, and commitment to supply chain success.

Transformational supply chain followers think critically about supply chain activities. This may occur as followers champion change initiatives and look for better ways to accomplish inter-organizational processes. Transformational supply chain follower organizations assume responsibility for their own contribution without direction from the supply chain leader. This includes making consistently sound decisions, executing tasks accurately and on-time, and seeking out opportunities to take on additional responsibilities that benefit the wider supply chain. Transformational supply chain followers develop strong relationships with the supply chain leader and other

members. The value placed on collaboration may influence followers to support the direction and goals established by the leader. The transformational supply chain follower demonstrates a commitment to overall supply chain success. Holistic supply chain goals should be aligned with the shared purpose established through the supply chain leader's vision. Transactional supply chain followers are not expected to exhibit these behaviors to as high a degree, and in fact may avoid them altogether. Thus, hypothesis 2 is:

**H2a:** *Transformational supply chain followers* exhibit higher levels of transformational behaviors, including a greater degree of critical thinking, assumption of responsibility, collaboration, and commitment to supply chain success.

**H2b:** *Transactional supply chain followers* exhibit lower levels of transformational behaviors, as demonstrated through passive acceptance of leader direction, resistance to change, avoidance of extra responsibilities, collaboration limited to organizational gain, and commitment to own organization performance results.

### **Supply Chain Networks**

A supply chain is defined as “a set of three or more companies directly linked by one or more of the upstream and downstream flows of products, services, finances, and information from a source to a customer” (Mentzer 2001, p.5). Consistent with this definition, supply chains considered in this research include multiple organizations, rather than a single vertically integrated firm. Thus, a supply chain network consists of a supply chain leader and one or more supply chain follower organizations. As summarized in Figure 2.10, four types of supply chain networks can be identified based upon the transformational or transactional styles exhibited by leader and follower organizations.

Transformational supply chain networks, found in quadrant 1 of Figure 2.10, are composed of a transformational supply chain leader and multiple transformational supply chain follower organizations. Transformational networks are populated by organizations

that view the supply chain holistically, have established a set of shared goals based on a well-articulated vision of the future, and are willing to make operational changes that may not directly benefit their own firm (Bass 1999; Kouzes and Posner 2004; Podsakoff et al. 1990). Transformational networks may be best suited to deal with rapidly changing environments making operational flexibility across members an important element necessary for addressing an uncertain future. Transactional supply chain networks, found in quadrant 4 of Figure 2.10, are comprised of a transactional supply chain leader and multiple transactional supply chain followers. Transactional networks are held together by a series of arms-length arrangements between members that focus each organization on achieving its own individual goals (Keller and Szilagyi 1976), leading to suboptimal overall supply chain results (Lambert and Pohlen 2001). Accommodating change may be more difficult in the transactional network, and therefore procedures may be more stable, allowing members to focus on cost reduction activities.

Recent leadership literature argues for leadership to be viewed as a co-influencing relationship between a leader and followers (Grundstien-Amado 1999; Hogg, Martin, and Weeden 2003). Translating this view into a supply chain context, the values, goals and rewards shared by a supply chain leader and supply chain followers reinforce the relationships found in transformational networks. In transactional networks follower role expectations are clarified by the clear sense of direction coming from the supply chain leader (Keller and Szilagyi 1976). Clear roles and the knowledge that decision-making authority rests with the leader define the transactional leader-follower relationship. When supply chain leaders and followers share leader-follower styles a high level of relationship development should exist. Thus, hypothesis 3 is:

**H3a:** A high degree of inter-relationship exists in supply chain networks where supply chain leaders and supply chain followers share a common style.

Mis-matched networks are found in quadrants 2 and 3 of Figure 2.10. These networks pair supply chain leaders and followers with differing styles. Consider the example of a transformational leader with a group of transactional followers (quadrant 3). The leader may identify a need for change and articulate it through a vision of the future, but a purely transactional follower may not willingly endorse the vision, potentially stalling or elongating the transformation process. The lack of alignment between members may lead to lower performance than either transformational or transactional networks. Mis-matched networks are outside the scope of this investigation.

### **Supply Chain Structural Outcomes**

Just as strategy drives the resulting structural form of organizations (Chandler 1962), the supply chain network formed through the combination of SCL and SCF styles of member organizations determines the supply chain structural form(s) found across the network (Defee and Stank 2005; Stock, Greis, and Kasarda 1999). Networks consisting of organizations with transformational styles are expected to develop structures that differ from those with primarily transactional styles. Three elements of supply chain structure are considered in this research: information availability, communications, and rewards.

Information is a critical integrating mechanism in supply chains (Kent and Mentzer 2003). Information availability (INF) is the capability to exchange information with internal and external supply chain members in a timely, responsive and useable format (Defee and Stank 2005). Wide information availability is found when most or all

supply chain members have access to supply chain volume and variability information such as customer ordering patterns and supply or production constraints. Wide information availability facilitates early response to supply and demand problems (Mentzer 2004), and allows the supply chain to become more agile (Goldsby, Griffis, and Roath 2006). These factors suggest supply chains providing wider information availability for members should be more closely associated with transformational networks. Limited information availability occurs in supply chains when members view their procurement, order, and inventory information as proprietary. Information may only be made available as other members agree to make a concession that benefits the organization possessing the information. Supply chains that limit information availability among members should be more closely associated with transactional networks

Communication is the glue that holds a supply chain network together (Mohr and Nevin 1990). Trust and relationship closeness is created by consistent communication among supply chain partners (Chu and Fang 2006; Hutt et al. 2000). Member satisfaction increases with improved quality of communication (Mohr and Spekman 1994), and relationship performance improves with communication frequency (Morris, Brunyee, and Page 1998). Communication (COM) is characterized as formal or informal. Informal communication occurs outside the formal communication flow and facilitates group cohesiveness (Johnson et al. 1994). Less formal communication among boundary spanning managers aids in the creation of shared goals (Ring and Van De Ven 1994), and facilitates tighter integration (Pagell 2004). By not being linked to a fixed schedule, informal communication may be the fastest conduit of critical information. Informal communication is flexible, associating it more closely with transformational networks.

Formal communication results from formal authority relationships and formal mechanisms for the coordination of work (Johnson et al. 1994), and may flow from authority. The type and frequency of formal communication is established by the supply chain leader, and is facilitated by supply chain information systems used to share data across members (Mentzer 2004). Formal communication allows a powerful supply chain leader to maintain control over supply chain follower activities. Thus, formal communication should be more closely associated with transactional networks.

Rewards (REW) are the compensation each supply chain member receives for carrying out its supply chain responsibilities. Rewards have traditionally been designed to maximize the benefit accruing to the organization developing the compensation plan. Although the literature has consistently concluded that rewards need to target holistic supply chain performance (Bowersox, Closs, and Cooper 2002; Holmberg 2000; Lambert and Pohlen 2001; Mentzer 2004), few supply chains have instituted such a system and therefore must continue to rely on firm-specific performance to determine rewards (Brewer and Speh 2000). Holistic supply chain rewards provide compensation to all members based on overall supply chain performance results rather than individual organization results. Holistic reward structures may require managers to sub-optimize their own organization's performance for the good of the supply chain (Bowersox, Closs, and Stank 1999; Cooper, Lambert, and Pagh 1997). Replacing firm-specific goals with supply chain-wide goals requires supply chain members to look beyond the needs of their own organization, making the establishment of holistic goals and rewards an expected outcome of transformational networks. Firm-specific rewards are frequently used since many firms are hesitant to share financial and operational information with supply chain



partners (Lambert and Pohlen 2001). Firm-specific reward structures incent supply chain organizations to maximize their own performance, perhaps at the expense of other members (Bowersox, Closs, and Stank 1999). The focus on maximizing organizational rewards links firm-specific rewards more closely to transactional networks. Anticipated structural outcomes are summarized in hypothesis 4:

**H4:** The more transformational the supply chain network style:

**H4a:** the greater the information availability among members.

**H4b:** the greater the degree of informal communications.

**H4c:** the greater the degree of holistic rewards.

### **Supply Chain Performance**

The concept of strategic “fit” is at the heart of SSP theory. Organizations able to create structures that are more closely aligned to strategy are expected to outperform rivals unable to achieve the same degree of strategy-structure fit (Miles and Snow 1984; Rumelt 1974). Likewise, supply chain performance should be heightened when strategy and structure are aligned across multiple organizations (Chow, Henrikssen, and Heaver 1995; Defee and Stank 2005). The transactional or transformational style of SCL and SCF are used to represent supply chain strategy in this research.

An important issue in measuring supply chain performance is the lack of holistic measures spanning all members (Holmberg 2000), although end-to-end performance improvement is a primary rationale for implementing SCM processes (Bowersox, Closs, and Cooper 2002; Lambert, Cooper, and Pagh 1998; Mentzer 2004). Performance evaluation in supply chains is difficult because it includes multiple dimensions, and firms often have conflicting goals (Chow, Heaver, and Henriksson 1994). The failure to develop boundary-spanning measures of performance may be the cause of ineffective

SCM results (Bowersox 1995). This research utilizes holistic measures of performance along the dimensions of efficiency and effectiveness (Mentzer and Konrad 1991).

Efficiency is defined as the measure of how well the resources expended are utilized (Mentzer and Konrad 1991), and may be equated with the ability of the supply chain to provide the required level of service at the lowest cost (Mentzer 2004). Transactional networks are defined by the supply chain leader's rules and processes. Clear rules may allow transactionally structured supply chains to focus on achieving greater quantity of output (Masi and Cooke 2000), and thus they should be highly efficient. A lack of supply chain-wide metrics within transactional supply chains may, however, encourage supply chain leader and follower organizations to act transactionally and optimize their own performance (Lambert and Pohlen 2001). Transformational networks should produce even more efficient performance than transactional networks because supply chain processes are evaluated holistically rather than as a series of dyadic exchanges, allowing greater visibility to overall inefficiencies (Brewer and Speh 2000). The holistic nature of transformational network structures should drive more efficient performance as outlined in hypothesis 5:

- H5a:** The greater the information availability exhibited in the supply chain the greater the efficient holistic performance.
- H5b:** The greater the degree of informal communications exhibited in the supply chain the greater the efficient holistic performance.
- H5c:** The greater the degree of holistic rewards exhibited in the supply chain the greater the efficient holistic performance.

Effectiveness is defined as the gap between customer expectations of performance and customer perceptions of the actual service quality delivered (Sharma, Grewal, and Levy 1995). Transactional leaders have been associated with a reduced commitment to

quality (Masi and Cooke 2000), suggesting transactional networks may be less capable of achieving highly effective performance. Contracts between transactional firms ensure a consistent level of customer service, but transactional networks may to be slower to accomplish change initiatives because contract review must occur prior to any significant process change. Further, the supply chain leader's understanding of a need for change may be delayed by the lack of shared information and formal communications processes in a transactional network. The implication is that transactional networks should provide good, but not outstanding, levels of effective performance.

Transformational networks focus on effective operations supporting high end-customer service levels (Hoyt and Blascovich 2003) facilitated by holistic goals and reward structures (Bass 1985a; Defee and Stank 2005). The emphasis on holistic goals and rewards motivates transformational supply chain leaders and followers to work collaboratively to create innovative process improvements (Hater and Bass 1988). A collective improvement approach should result in more effective processes because the best thinking of multiple organizations is part of the design, as opposed to the abilities of only the supply chain leader in a transactional supply chain. This suggests networks with transformational structures are more effective than those with transactional structures.

This leads to hypothesis 6:

- H6a:** The greater the information availability exhibited in the supply chain the greater the effective holistic performance.
- H6b:** The greater the degree of informal communications exhibited in the supply chain the greater the effective holistic performance.
- H6c:** The greater the degree of holistic rewards exhibited in the supply chain the greater the effective holistic performance.

## **RESEARCH METHODOLOGY**

Supply chains are complex, dynamic environments and results of any supply chain research risks confounding by extraneous factors. To address this concern an experimental design using interactive simulation was used to afford the greatest precision of results for the SCL, SCF, structure and performance phenomena being studied (Kerlinger and Lee 2000). Iconic models are one form of simulation and are used to produce a physical representation of a system, such as a flight simulator (Kelton, Sadowski, and Sadowski 1998). Interactive participant simulations, in which participants take on roles, are a similar type of simulation. The Supply Chain Value game (Stank 2003) was used in this research to provide a controlled supply chain environment. The game has been used extensively in executive education. Simulation outcomes are determined by participants' interactions within the context of the game environment.

The simulation replicates the interactive activities of a manufacturing-to-retail supply chain. Participants in the game assume the roles of managers and employees engaged in source, make, and deliver activities for three products to satisfy retail customer demand. Specific enterprises represented include suppliers, a manufacturing firm, retail customers, and the transportation providers necessary to move product between the supply chain organizations. The game is run in two parts, with the first simulating conditions in a traditional "anticipatory" value-chain that utilizes long-term forecasts of demand and promotions to attempt to satisfy demand. The second run incorporates reengineering suggestions made by participants to streamline the value-chain and allow it to respond to, rather than anticipate demand. The participant survey, sample demographics and supporting analysis are included in Appendix B.

## **Data Collection**

The sample consisted of 253 experienced managers and executives with significant supply chain knowledge. These participants were generated from 12 separate simulation applications. Participants in the sample all worked in supply chain roles for their organizations at the time of data collection. A background of experience in supply chains was believed to be valuable because it ensured participants had a frame of reference useful for making supply chain decisions in the game. However, participant responses were based solely on their experience in the simulation rather than any previous work experiences. Experienced supply chain executives and managers accounted for 72% of the sample with the remaining 28% occupying analyst roles. 58% of participants held supply chain positions for at least six years. Participants represented all supply chain echelons with retailer (45%), distributor (24%) and transportation company (10%) being the most frequently reported. Study participants worked for companies of varying sizes, and 60% of the sample is represented by firms with revenue of \$5.0-\$9.9 billion. Sample demographics are shown in Appendix B.

Each participant completed two surveys, one at the conclusion of each simulation run. A total of 502 surveys were collected (253 for run 1, and 249 for run 2). Non-response bias was not considered an issue since over 99% of participants completed both surveys. Participants were asked to skip questions concerning behaviors they did not observe in the simulation. This instruction reduced the problem of forcing responses where no basis for answering existed, but probably resulted in an increase in missing data with 6.8% of the total possible data points left unanswered. The majority of missing data was contained in 29 surveys with more than 25% of the items left unanswered. These

cases were dropped, leaving a dataset for analysis containing 473 cases (239 in run 1, and 234 in run 2). Missing data accounted for 1.4% of possible responses in the reduced dataset. The Expectation-Maximization algorithm in SPSS 15.0.1 was used to estimate and replace missing values. Comparison of means from the reduced dataset with the dataset containing imputed values showed no significant differences.

### **Scale Development**

Measurement scales were developed following the process outlined by Churchill (1979), Dunn, Seaker, and Waller (1994), and Anderson and Gerbing (1988). Each scale included a combination of items from existing scales and newly developed items created to ensure full coverage of the construct domains. Several SCL scale items were adapted from the Multifactor Leadership Questionnaire (MLQ) (Avolio and Bass 2004). Many of the SCF scale items were based on the Effective Followership questionnaire (Kelley 1992). The INF measurement scale included items adapted from Fawcett, Stanley, and Smith (1997). The COM scale contained items adapted from multiple published scales (Li and Dant 1997; Menon, Jaworski, and Kohli 1997; Mohr, Fisher, and Nevin 1996). The REW scale was adapted from Mollenkopf, Gibson, and Ozanne (2000). All scales utilized a 5-point Likert scale to remain consistent with the original MLQ scale.

Many of the adapted measures had never been used in a cross-organizational, supply chain context. Thus, multiple new items were developed to increase the pool of available items for each construct. An initial pool of 125 items was reduced in two steps. Initially, 12 subject matter experts reviewed the items in terms of item specificity, representativeness, readability and face validity. This was an iterative process resulting in the re-wording of six items and elimination of 13 items. The resulting 112-item survey

was then pilot tested with 25 simulation participants, who were not part of the final sample. Pilot test results were examined for inter-item reliability using coefficient alpha. Responses were examined separately for run 1 versus run 2. Items retained in the final survey instrument had to perform well across both simulation scenarios. Elimination of the poorest performing items produced the 79-item survey used for final data collection. All scales exceeded the recommended .70 cutoff value for alpha (Churchill 1979).

## **RESULTS**

### **Evaluation of Measures**

AMOS 7 is the structural equation modeling (SEM) software used for data analysis. The two-step approach recommended by Anderson and Gerbing (1988) was followed by initially evaluating the measurement model then estimating the *a priori* structural model. Confirmatory factor analysis (CFA) was used to determine construct validity including testing for unidimensionality, reliability, convergent validity and discriminant validity (Garver and Mentzer 1999). Because of the large number of items used in the survey, a CFA was first performed on each scale independently to facilitate scale purification. Later CFA models combined scales until the complete measurement model containing all constructs was examined. The structural model was considered only after the measurement model demonstrated good fit.

Scales were evaluated for item loadings of the expected direction, statistical significance ( $\alpha \leq .05$ ), with standardized parameter estimates of at least .70 to ensure unidimensionality and convergent validity (Hulland, Chow, and Lam 1996). Standardized residuals greater than 2.00 and modification indices larger than 10 were used to identify candidate items for deletion (Medsker, Williams, and Holahan 1994;

Steenkamp and Trijp 1991). Using these criteria, 29 items were retained including a 7-item SCL scale, 10-item SCF scale and 4-item scales for INF, COM, and REW. Scale reliability was confirmed with coefficient alpha greater than .87, SEM construct reliability greater than .88 and average variance extracted (AVE) greater than 61% for each construct in both participant groups. One item (Q37, My company independently thinks up new ideas that contribute to supply chain goals) marginally failed these criteria with a path weight of .69 in the transactional group but was retained as essential for describing the domain of the construct. Overall fit of the measurement model was good ( $\chi^2 = 1235.59$  at 758 degrees of freedom, root mean square error of approximation [RMSEA] = .04, comparative fit index [CFI] = .96, Tucker-Lewis index [TLI] = .95).

Discriminant validity was assessed three ways. First, Mackenzie, Podsakoff, and Jarvis (2005) recommend intercorrelations among the constructs be less than .70. All pairs of constructs met this cut-off, except for the intercorrelation between COM and REW of .79 for the transactional environment and .72 for the transformational group. Second, a series of nested models were specified constraining the covariance between each pair of constructs to one (Anderson and Gerbing 1988). All  $\chi^2$  difference tests were significant ( $p \leq .05$ ) indicating the distinct theoretical constructs provided better fit. Third, Fornell and Larcker (1981) advocate comparing the AVE for each construct to the shared variance between all possible pairs of constructs. AVE exceeded shared variance in each case. These tests provide overall support for discriminant validity among the constructs. Tables 4.1 and 4.2 provide a summary of the construct validity analysis.

Common method bias may confound results when measures are obtained from the same source (Campbell and Fiske 1959). A construct not theoretically related to any



**Table 4.1: Construct Validity (Transactional Group)**

<b>Construct</b>	<b>Item</b>	<b>Std Item Loading</b>	<b>Sq Mult Corr</b>	<b>Construct Reliab</b>	<b>Coeff Alpha</b>	<b>AVE</b>	<b>Highest Shared Variance</b>
SCL	Q5	0.71	0.50	0.94	0.94	69%	48%
	Q9	0.79	0.62				
	Q10	0.81	0.66				
	Q11	0.88	0.77				
	Q13	0.91	0.83				
	Q17	0.90	0.80				
	Q26	0.82	0.67				
SCF	Q37	0.69	0.48	0.95	0.94	64%	40%
	Q41	0.72	0.52				
	Q43	0.82	0.66				
	Q45	0.79	0.62				
	Q47	0.87	0.75				
	Q50	0.84	0.71				
	Q51	0.77	0.59				
	Q54	0.80	0.64				
	Q56	0.84	0.70				
	Q59	0.85	0.72				
INF	Q62	0.79	0.63	0.89	0.89	66%	46%
	Q63	0.87	0.75				
	Q64	0.86	0.73				
	Q65	0.74	0.54				
COM	Q68	0.81	0.66	0.89	0.89	68%	62%
	Q69	0.88	0.77				
	Q70	0.87	0.76				
	Q71	0.73	0.53				
REW	Q77	0.81	0.65	0.90	0.89	69%	62%
	Q79	0.77	0.59				
	Q80	0.88	0.78				
	Q82	0.85	0.72				
OPP	Q83	0.79	0.62	0.91	0.91	71%	5%
	Q84	0.87	0.75				
	Q85	0.87	0.76				
	Q86	0.86	0.74				

**Table 4.2: Construct Validity (Transformational Group)**

<b>Construct</b>	<b>Item</b>	<b>Std Item Loading</b>	<b>Sq Mult Corr</b>	<b>Construct Reliab</b>	<b>Coeff Alpha</b>	<b>AVE</b>	<b>Highest Shared Variance</b>
SCL	Q5	0.70	0.49	0.92	0.92	61%	47%
	Q9	0.80	0.64				
	Q10	0.78	0.61				
	Q11	0.80	0.64				
	Q13	0.79	0.63				
	Q17	0.78	0.61				
	Q26	0.81	0.66				
SCF	Q37	0.70	0.49	0.95	0.95	65%	47%
	Q41	0.71	0.50				
	Q43	0.83	0.69				
	Q45	0.82	0.67				
	Q47	0.85	0.71				
	Q50	0.85	0.72				
	Q51	0.79	0.63				
	Q54	0.82	0.68				
	Q56	0.84	0.70				
	Q59	0.83	0.69				
INF	Q62	0.84	0.71	0.93	0.92	76%	47%
	Q63	0.87	0.76				
	Q64	0.91	0.83				
	Q65	0.86	0.75				
COM	Q68	0.79	0.62	0.88	0.87	65%	52%
	Q69	0.82	0.66				
	Q70	0.87	0.76				
	Q71	0.73	0.54				
REW	Q77	0.80	0.64	0.88	0.88	65%	52%
	Q79	0.78	0.62				
	Q80	0.81	0.66				
	Q82	0.83	0.69				
OPP	Q83	0.86	0.74	0.94	0.94	81%	7%
	Q84	0.91	0.82				
	Q85	0.94	0.89				
	Q86	0.89	0.80				

other constructs in the research was included to test for common method bias (Lindell and Whitney 2001). The marker variable used was Opportunism (OPP) and was adapted from the scale used by Moore and Cunningham (1999). OPP measures the extent to which supply chain members take advantage of a relationship for their own benefit. The OPP construct demonstrated convergent validity, discriminant validity and reliability. All item loadings were in the expected direction, above .70, and statistically significant ( $\alpha \leq .05$ ). Construct reliability and coefficient alpha were greater than .90 for both groups. AVE was above 71% and exceeded shared variance for both groups. Common method bias was assessed by comparing a model allowing all five substantive constructs to load onto one second-order factor to a similar model that also included OPP loading onto the second-order factor. The model excluding OPP demonstrated better fit, and in the alternate model all paths, except the path to OPP, were significant ( $p \leq .001$ ). The results support a conclusion that common method bias did not exist in this research.

### **Overall Structural Model Fit**

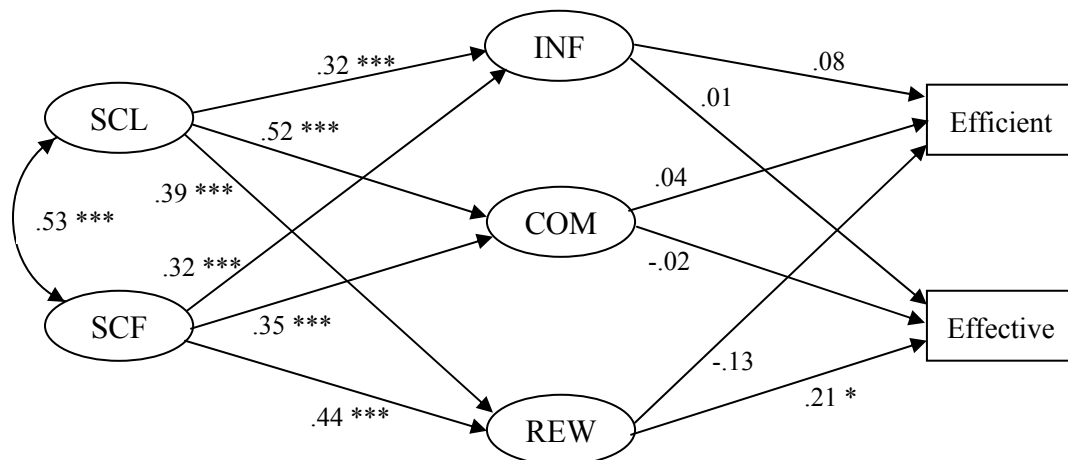
Figures 4.2 and 4.3 provide a summary of the maximum likelihood estimates and tests of significance for each hypothesized relationship. The structural model demonstrated good overall fit ( $\chi^2 = 1545.85$  at 870 degrees of freedom, RMSEA = .04, CFI = .94, TLI = .93). A lambda equivalent model was used to test the proposed model and hypotheses to ensure the items were given equal weight across the groups. All but one of the path weights between SCL, SCF and the structural constructs (INF, COM, REW) were significant ( $p \leq .001$ ). Interestingly, only three path weights from the structural constructs to the efficiency and effectiveness performance outcomes were significant (at least  $p \leq .05$ ), and no common significant path was found for both groups.

## Hypothesis Testing

A significant outcome in the two group design used in this research requires the hypotheses be examined separately for the transactional (Run 1 of the simulation) and transformational groups (Run 2).  $H_1$  and  $H_2$  were evaluated using the measurement model.  $H_3$  through  $H_6$  were tested using the structural model in Figures 4.2 and 4.3.

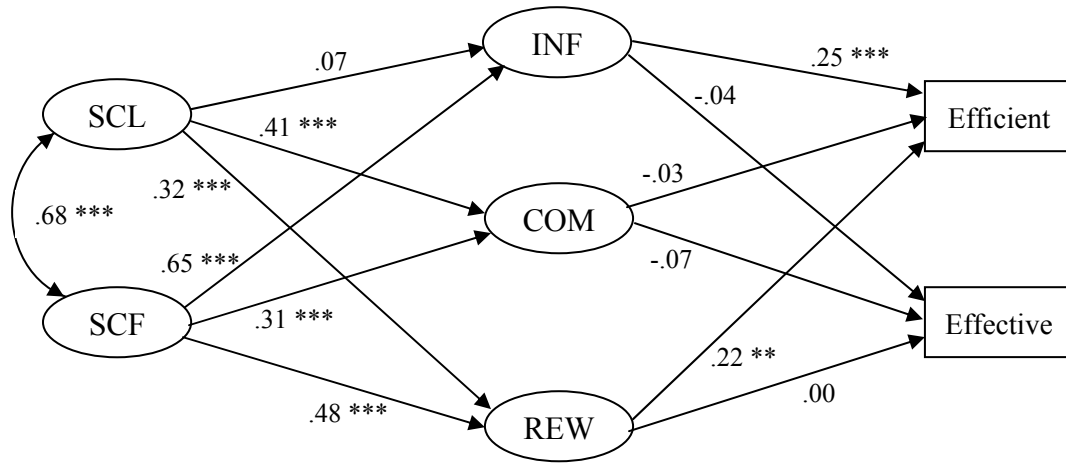
$H_{1a}$  and  $H_{1b}$  are both supported. The behaviors associated with transformational leaders (inspiration, intellectual stimulation, and individualized consideration) describe the domain of SCL. The measurement model resulted in the creation of a valid and reliable 7-item scale that distinguished among SCL styles on the basis of the presence (transformational SCL) or absence (transactional SCL) of these behaviors. The transactional group and transformational group were found to be significantly different by non-overlapping confidence intervals around the means. An independent samples t-test confirmed the two group means were significantly different ( $t = 16.072$ ,  $p \leq .001$ ).

**Figure 4.2: Standardized Path Weights for Transactional Group**



- \* Statistically significant at the  $\alpha = .05$  level
- \*\* Statistically significant at the  $\alpha = .01$  level
- \*\*\* Statistically significant at the  $\alpha = .001$  level

**Figure 4.3: Standardized Path Weights for Transformational Group**



\* Statistically significant at the  $\alpha = .05$  level  
 \*\* Statistically significant at the  $\alpha = .01$  level  
 \*\*\* Statistically significant at the  $\alpha = .001$  level

H<sub>2a</sub> and H<sub>2b</sub> are both supported. The behaviors associated with transformational followers (critical thinking, assumption of responsibility, collaboration, and commitment to supply chain success) describe the domain of SCF. The measurement model resulted in the creation of a valid and reliable 10-item scale that distinguished among SCF styles via the presence (transformational SCF) or absence (transactional SCF) of the behaviors. The mean for each group was found to be significantly different when comparing confidence intervals and using the independent samples t-test ( $t = 13.461, p \leq .001$ ).

H<sub>3</sub> was supported at  $p \leq .001$ . In both transactional (.53) and transformational groups (.68), SCL and SCF are highly inter-related as measured by the significant covariance weights found in each environment.

H<sub>4b</sub> and H<sub>4c</sub> were both supported as expected ( $p \leq .001$ ). SCL and SCF separately contributed to more informal communications between members in the transformational environment. Likewise, holistic rewards were found to be linked with transformational

SCL and SCF. The result for H<sub>4a</sub> is not as straightforward. This hypothesis is fully supported in the transactional group ( $p \leq .001$ ). In the transformational group, only the path from SCF to INF is significant ( $p \leq .001$ ), and the path weight in this group is much stronger than in the transactional environment. Two new models were created to further assess differences between the environments. First, a model forcing the SCL to INF path to equal zero was established and determined to not be significantly different from the baseline lambda equivalent model ( $p = .379$ ). Because the model compensates adequately for the missing path, this suggests transformational SCL does not promote wider information availability. Second, a model was developed building on the above model and forcing the weights of each group to be equal for the SCF to INF path. This final model was found to perform as well as the lambda equivalent model ( $p \leq .001$ ). The interpretation of this analysis suggests that in transactional environments SCL and SCF contribute equally to reduce information availability. In transformational environments, however, SCF is the primary reason for greater availability of information.

Among the most surprising results were the performance outcomes associated with H<sub>5a</sub> through H<sub>5c</sub> (efficient performance) and H<sub>6a</sub> through H<sub>6c</sub> (effective performance). In the transactional environment only the REW to EFFECTIVE performance path was found to be marginally significant ( $p \leq .05$ ). Not only were the effects of INF and COM on performance not significant, the lack of any significant EFFICIENT result was counter to previous leadership literature that found transactional behaviors led to increased production output (Jung and Avolio 2000) and had an inverse relationship with quality and customer service (Masi and Cooke 2000). Conversely, EFFICIENT performance had significant paths from INF ( $p \leq .001$ ) and REW ( $p \leq .01$ )

in the transformational environment. Arguably the effect of SCF is the greater contributor to EFFICIENT performance in the transformational environment because SCL was found to not influence INF, and the SCL to REW (.32) path weight is much lower than the SCF to REW path weight (.48). Once again, the EFFICIENT results are counter to past research that found transformational leaders create environments where followers produce higher quality output (Hoyt and Blascovich 2003).

Several issues may contribute to the unexpected performance outcomes found in this research. First, the performance outcomes anticipated by H<sub>5</sub> and H<sub>6</sub> were heavily influenced by past findings of research into the behaviors and reactions of individual leaders and followers. Perhaps the actions of individual leaders and followers cannot be directly translated to the organizational level. Second, the majority of past supply chain studies investigating performance have utilized firm-specific performance rather than supply chain-wide performance (Brewer and Speh 2000; Lambert and Pohlen 2001). Firm-specific performance was not captured in this research, so it is not known whether performance at the firm level may have been more conclusively linked to INF, COM, and REW. Third, the limited duration of the simulation may prevent capturing more effective processes in run 2 (transformational group).

## **DISCUSSION AND IMPLICATIONS**

This research provides a starting point for understanding the concepts of SCL and SCF and their impact on supply chain structural and performance outcomes. The theory outlined is distinct from previous descriptions of SCL because it looks at the leader's role holistically by incorporating the behaviors and influence of all supply chain members.

The findings suggest SCL and SCF both contribute to supply chain structural outcomes, and most interestingly, that SCF may be a larger force than SCL under certain conditions.

### **Managerial Implications**

Judging by the great disparity in the number of published works, leadership has been presumed to be an important contributing factor to performance (Bass 1990). Followership has not been viewed with the same interest (Chaleff 2003). An important finding of this investigation is that followers have the potential to significantly influence supply chain outcomes, and in a transformational environment SCF may be the primary factor. This is supported in the transformational environment by the lack of a significant result for SCL on information availability, and the positive results of SCF to all structural outcomes and efficient performance. In transformational networks, supply chain follower organizations may be more willing to take on a larger role. Thus, managers in supply chain leader organizations that recognize the presence of transformational behaviors across the supply chain should ensure supply chain follower organizations are given the opportunity to contribute ideas and make decisions that have an effect on structural development (e.g., process change) and/or are provided with holistic performance reward criteria. This appears to be especially true when greater information sharing is desired to facilitate activities across multiple supply chain organizations.

Transactional and transformational networks appear to develop different processes. These structural outcomes are the result of both SCL and SCF in the transactional environment, and primarily due to SCF in the transformational environment. Greater information sharing is especially important to transformational supply chain followers as their desire to drive change and achieve supply chain goals could be limited



by a lack of information. Supply chain leaders exert slightly more influence on the type of communication found in both transactional and transformational networks based upon the higher path weights found for SCL in both environments. Somewhat surprisingly, supply chain followers may be more responsible for the type of reward structures created in both environments, and this is especially true in transformational networks. Managers can benefit from ensuring the structures developed in their supply chain environments link appropriately to the leadership and followership styles of behavior exhibited.

Follower's contribution to supply chain performance may be underappreciated. Managers wanting to attain supply chain-wide performance goals, while using transformational behaviors, should emphasize the role of follower organizations. Followers take on and accomplish the majority of supply chain tasks due to their greater numbers (Dixon and Westbrook 2003). Supply chain leaders may find improved efficiency when followers share information and help establish holistic rewards.

### **Implications for Researchers**

Interactive simulations have not been used often in supply chain research. This type of simulation, such as the Supply Chain Value game used in this research, may offer a fresh source for data collection when traditional survey research methods are not appropriate. Actual supply chains are very complex and the potential for confounding interactions increases when compared to typical single firm, or even dyadic, research. A simulation provides control over the complexities found in the real world (McGrath 1982), allowing the researcher to focus on the constructs of interest.

Theories of business, and specifically theories in the supply chain realm, often have their roots in other disciplines such as anthropology, psychology, or sociology

(Stock 1996). The theory of supply chain leadership examined in this research is founded principally on theories developed in the leadership field. A contribution of SCL theory is that it is based on the findings of dozens of studies into the behavior of leaders in a social or organizational context. These individual behaviors have been elevated and applied at the organization level in this research. There is an ongoing need for new theory to explain supply chain relationships and predict supply chain outcomes, and researchers interested in understanding complex, inter-organizational behavior may benefit from borrowing theory originally applied to individuals.

Defee and Stank (2005) portrayed five elements of supply chain structure culled from previous SSP literature. Although extensively described, empirical research into specific supply chain structures has been limited. The findings of this research demonstrate structural elements can be perceived by participants and measured effectively. Past SSP research has consistently shown the casual connection between structure and performance. Supply chain researchers should continue to investigate the structure-performance connection as it applies to supply chain organizations.

### **Limitations and Future Research**

A primary purpose of this research was the development of valid and reliable scales for SCL and SCF, making precision a more important criterion than generalizability or realism (McGrath, Martin, and Kula 1982). When precision is a primary goal of research, managers and researchers should not generalize the findings beyond the boundary of the study. Additional research, using other methods and seeking other goals, is necessary to extend the findings and draw broader conclusions.

Expanding the survey beyond the simulation to the real world experiences of supply chain managers will allow for greater generalizability of future findings. A first step is to administer the survey to managers from multiple companies in a single supply chain, or multiple closely connected supply chains. This approach may be best facilitated in supply chains with an influential supply chain leader able to convince supply chain partners to participate. Under this approach the findings may serve as a diagnostic tool for the supply chain leader and interested supply chain followers to assess the network style present in the supply chain. Comparing findings across multiple supply chain environments may facilitate identification of network style variations beyond the purely transactional or transformation styles considered in the simulation.

A mixed methods approach has been suggested as appropriate to provide conceptual depth and generalizability (McGrath 1982). Many researchers tend to think of this linearly with qualitative methods being applied prior to quantitative methods, but the sequence of methods used is of less importance when considered over a long-term research program (Creswell 2003). A follow-on qualitative study is therefore recommended to deeply explore the domains of SCL and SCF. An in-depth analysis of managers' perceptions of SCL and SCF may identify behaviors specific to organizations that are not found in the descriptions of leadership and followership based on individuals. Additionally, SCL and SCF behaviors are currently assumed to have equal weight. The relative importance of each behavior may be best uncovered through qualitative inquiry.

While both leadership and followership are important, the styles of SCL and SCF that ultimately create the network style may be of great importance. Networks with matching styles are theorized to outperform mis-matched networks. However, mis-

matched networks were outside the scope of this research. Future research should include a comparison between matched networks and mis-matched networks to test this proposition.

## CHAPTER 5 – ARTICLE 2: ROLE OF FOLLOWERSHIP IN SUPPLY CHAINS

Significant research attention has been paid to defining the characteristics of leadership and leaders. Leaders, however, cannot be properly defined without also identifying a group of willing followers (Hollander 1978). Despite being complementary concepts, it has been estimated that thousands of leadership publications are produced annually, while followership garners little mention (Brown 2003; Chaleff 2003; Collinson 2006). An underlying assumption of much of this research is that leadership is something done to others (Goffee and Jones 2006) and that followers are viewed as an indistinguishable group falling subject to the leader's wishes (Collinson 2006).

The disparity holds in the supply chain management related disciplines. Supply chain leaders have been described frequently (Bowersox and Closs 1996; Burnson 2003; Fawcett and Magnan 2004; Lambert, Stock, and Ellram 1998), with supply chain leadership considered an important precondition of supply chain management success (Bowersox 1995). A recent published analysis found that supply chain leaders experience growth in market capitalization up to 26% higher than non-leaders (Byrne 2004). This statistic confirms leadership has a beneficial effect – on the leader's results! Supply chain followership, on the other hand, has not been described in the literature.

Supply chains are defined as consisting of a supply chain leader *and* two or more other members directly linked by one or more upstream and downstream flow of products, services, finances, and information with the goal of providing mutual performance benefit for all supply chain participants, not just the leader (Mentzer 2001). Supply chain performance is a holistic concept requiring the identification of end-to-end goals, measures and rewards (Brewer and Speh 2000). Contributions from all supply

chain members are needed to create optimal supply chain-wide performance. At the firm level, it has been argued that up to 80% of organizational success is the result of the contributions of followers (Kelley 1992), because followers always outnumber leaders by a significant margin (Dixon and Westbrook 2003). We believe the conclusion is valid in supply chains also. The lack of research documenting the contributions of supply chain followers represents a significant unexplored gap worthy of attention.

The intention of this research is to provide a foundation for the study of supply chain followership. Two research questions guide this investigation. First, how should followership be defined in the inter-organizational context of supply chains? The concept of supply chain followership is developed to identify the defining characteristics of followership and produce a definition supporting the current and future research efforts. Second, how should supply chain followership be measured? To answer this question, we present a summary of the steps taken to create a valid and reliable scale of supply chain followership that researchers can use in the future. Finally, we introduce and test a model that hypothesizes how followership contributes to supply chain performance

## **LITERATURE REVIEW AND CONCEPTUALIZATION**

Leadership has been considered the single most important factor in the success or failure of institutions (Bass 1990; Day and Lord 1988) and has been described as a strategic source of competitive advantage (Waldman et al. 2001). Four elements, synthesized from the many available definitions (Bass 1990; Yukl 2001), are used to describe leadership: influence, identifiability, vision, and relationship. *Influence* may flow from authority (Janda 1960) or may occur outside a source of power (Jacobs 1970). The leader should be distinguishable from followers, or *identifiable*, through their

behaviors and greater capacity for influence (Shamir 1999). Leaders identify a need for change, often expressed through a *vision* of the future (Richards and Engle 1986; Schein 1992). Finally, leaders and followers create a mutually-defined *relationship* built on shared goals, commitment, and dual influence (Hogg, Martin, and Weeden 2003; Kouzes and Posner 2004). Research has begun to explore this relational process of leadership by incorporating followers into a holistic transformational concept (Marion and Uhl-Bien 2001). The literature review below summarizes the paradigm of transformational leadership and followership, defining characteristics of each in a supply chain context, and culminating with the introduction of a conceptual model that portrays the relationships among supply chain leadership, followership, and performance.

### **A New View of Leadership**

Transformational leadership theory has gained prominence (Bass 1999; Hunt 1999; Yukl 2001) and considers the leader and followers as existing in a mutually reinforcing relationship. This type of leader understands that followers have their own needs and wishes beyond the goals of the organization (Bass et al. 1987), providing followers a significant opportunity for influence (Grundstien-Amado 1999). The objective of the transformational leader is to motivate followers – rather than attempting to control them – to look beyond their own individual needs by focusing on broader goals that will benefit the organization (Perry 2000).

Transformational leadership has been juxtaposed with transactional leadership on a continuum of leadership behaviors (Burns 1978). Transformational leaders attempt to raise the consciousness of followers to see greater possibilities in the future. Transactional leaders take a shorter term view and consider each interaction with

followers an independent event to be optimized. Transactional leaders are described by Hollander's (1978) social exchange theory. In this view, leaders and followers exist within a series of give-and-take exchanges (Bass 1985). Both the leader and followers have needs to be met by the relationship. Leaders want tasks to be accomplished. Followers want to be adequately compensated for their work. Leaders provide an incentive for task accomplishment, and followers trade their effort to obtain a reward (e.g., wages) or avoid a punishment for falling short of the goal (e.g., a reprimand).

Under transformational leadership theory, leaders are found to exhibit five fundamental behaviors: inspiration, intellectual stimulation, individualized consideration, contingent reward, and management-by-exception (Avolio and Bass 2004; Avolio, Bass, and Jung 1995; Bass 1997; Hater and Bass 1988; Howell and Avolio 1993; Waldman, Bass, and Yammarino 1990). Of the five, transformational leaders demonstrate inspiration, intellectual stimulation and individualized consideration more frequently than transactional leaders. Inspiration is related to the creation of a vision of an improved future (Podsakoff et al. 1990), and is particularly motivating when articulated in terms that reflect shared values and goals established between leader and followers. Intellectual stimulation is found when the leader asks followers to utilize their creativity to find better solutions to current problems (Avolio, Bass, and Jung 1999). Individualized consideration occurs as the leader pays attention to the unique skills and developmental needs of individual followers (Hater and Bass 1988). Contingent reward and management-by-exception have been found in both transactional and transformational leaders (Bass and Avolio 1993). Because they do not differentiate between leadership styles, these behaviors are not considered further in this research.



Even though transformational theory is much more inclusive of followers than many past theories, the role of followers has been downplayed. Importance is placed on the leader's *style* as being either more transformational or more transactional. The interactions of leaders and followers are assumed to be directed by the transformational or transactional behaviors exhibited by the leader, thus minimizing the influence of followers. Followers are assumed to match the leader's style. The *fit* of the follower's own style with the leader has been an overlooked issue that will be revisited in this research once the concept of followership is further developed.

### **The Importance of Effective Followership**

The term follower, as traditionally applied, carries a negative connotation (McGregor 2006), and has often been used to refer to someone requiring constant direction (Banutu-Gomez 2004). This negative view of followership conjures up images of docile, conforming, weak, "yes" men; timid personalities that could not make the grade as leaders, and thus fail to excel (Chaleff 2003; Kelley 2004). Leadership in this context is assumed to be a unidirectional model of what a leader does to a subordinate (Yukl and Fleet 1992), and the role of followers is based on their perceived susceptibility to the leader's behaviors and style (Howell and Shamir 2005).

Another view concludes followers are not the antithesis of leaders (Kelley 1992). Followers are important to organizational success, and may collaborate with leaders and assume control over their own actions to achieve personal and organizational goals (Chaleff 2003). Research confirms followers maintain their own identity (Collinson 2006). Followers may be influenced by a leader, but will only endorse a leader that aligns with the values forming their own identity (Hogg, Martin, and Weeden 2003).

Followership has been found to be measurable (Dixon and Westbrook 2003), but no consensus definition exists to describe the concept. Even enthusiasts of followership have avoided creating specific definitions (McGregor 2006). A generalized definition of followers and followership is needed to define the boundaries of the concept and allow for effective analysis. Howell and Shamir (2005, pps. 98-99) define a follower as “a person who acknowledges the focal leader as a continuing source of guidance and inspiration, regardless of whether there is any formal reporting relationship.” This definition fails to adequately identify the behaviors necessary to describe the domain of followership. Two models of followership are examined next to identify behaviors that may be used to more fully describe the concept.

### **Characteristics of Followership**

Kelly’s (1992) model locates followership style in a space defined by the two behavioral dimensions of critical thinking and active engagement. Actively engaged followers that demonstrate independent, critical thinking ability are described as *exemplary followers*. The opposite are the *passive followers* who do not demonstrate independent, critical thinking abilities and are not actively engaged. The latter category is closely associated with the negative connotation of a follower.

Potter, Rosenbach and Pittman (2001) identify follower types in a two-dimensional space defined by relationship orientation and performance orientation. Individuals high on the relationship dimension identify with the leader’s vision, demonstrate trustworthiness through their behaviors, and communicate honestly with the leader. Individuals high on the performance dimension hold personal performance standards above those required by the job, cooperate willingly with peers, take on

leadership roles as needed, and embrace change by looking for new ways to accomplish tasks. Followers exhibiting these characteristics are labeled *partners*. This follower style relates to the leader on equal footing, and may be populated by individuals who are leaders-in-waiting. *Subordinates* rate low on both dimensions and, as in Kelley's model, this group is most closely aligned with the negative view of followers.

Both models propose that a follower's behaviors can be evaluated to determine a style of followership. Four behaviors are used to define the domain of followership: thinking, responsibility, collaboration, and commitment. Followers may be distinguished on the basis of their *style of thinking*. Critical thinking behavior (Kelley 1992) may be manifested through routinely looking for better ways to accomplish a task, providing constructive criticism as a way of developing peers and subordinates, and designing creative solutions to unforeseen problems (Banutu-Gomez 2004). Critical thinkers actively participate in organizational transformation (Chaleff 2003), and champion new ideas (Banutu-Gomez 2004). Directed thinkers prefer to maintain the status quo, and may avoid situations requiring significant change. This type of thinker may require closer oversight, especially for newly assigned tasks.

The *scope of responsibility* is the second differentiating characteristic of followers (Chaleff 2003). Followers seek expanded responsibilities by first demonstrating a high competence with in-role tasks, then taking on extra-role activities (Podsakoff et al. 2000; Podsakoff et al. 1990). This may involve off-loading work from the leader, or picking up a task that has been set aside by others. Extra-role performance is an example of the follower going beyond what is required for the good of the organization (Banutu-Gomez

2004). Other followers desire to maintain more stable responsibilities. These followers also demonstrate solid in-role performance but do not willingly accept additional scope.

The third distinguishing characteristic of followers is their *desire to collaborate* with leaders and others throughout the organization. Followers seeking to actively collaborate will tend to develop a network of relationships to ensure they can bring the necessary skills to bear on a problem when their own expertise is limited (Kelley 1992). They are willing to assist others if it benefits the organization, and work cooperatively with the leader to accomplish mutually held goals (Kouzes and Posner 1990). Other followers do not seek to expand their circle of relationships, and their interactions with the leader are more likely to be directed by the leader. They may collaborate, but their approach will be more reactionary and situationally dependent. These passive collaborators may limit their collaborations to times when personal benefit is greatest.

Demonstrating *commitment* (Banutu-Gomez 2004; Lundin and Lancaster 1990) is the fourth characteristic of followership. Group-oriented followers show their elevated commitment to the organization through the creation of a shared purpose with the leader (Chaleff 2003). This purpose could be achievement of the goals associated with the leader's vision (Kouzes and Posner 1987). Group-oriented followers demonstrate commitment by challenging the leader's direction when it strays from mutually-held goals (Chaleff 2003). Self-oriented followers focus on completing assigned tasks, and accomplishing goals that directly impact their own standing. They are unlikely to disagree with the leader unless the decision has a direct impact on their own welfare.

The followership characteristics of thinking style, scope of responsibility, desire for collaboration, and commitment orientation describe the domain of followership. The

definition of followership emerges when combined with the earlier description of leadership as a relational activity: *Followership is a relational concept between leader and follower in which the follower exhibits thinking, responsibility, collaboration, and commitment behaviors that define goal orientation and motivation(s) to succeed.*

The transformational-transactional paradigm may be used to classify followers on the basis of their behaviors in the same way it has previously been applied to leaders. Transformational followers are most closely associated with critical thinking ability, expanded scope of responsibilities, active collaboration, and commitment to group goals. This style of follower is more accepting of change. Transactional followers may be viewed as more directed thinkers, interested in maintaining their existing scope of responsibilities, passive collaborators, and committed to individual goals. This style of follower prefers a stable environment.

### **Supply Chain Leadership and Followership**

Supply chain leaders and followers can be identified by the behaviors they exhibit. An organization may project “behaviors” through the policies and procedures it establishes, and through standards of conduct of boundary spanning managers. The interconnected nature of the concepts makes it necessary to define both supply chain leadership and supply chain followership.

Supply chain leadership (SCL) is a relational concept involving the supply chain leader and one or more supply chain follower organization that interact in a dynamic, co-influencing process. The supply chain leader is the organization that demonstrates higher levels of the four elements of leadership in relation to other members. This is the organization capable of greater influence, readily identifiable by its behaviors, that

creates and articulates a vision of the future, and that establishes a relationship with other supply chain organizations. The relative level of inspirational, intellectual stimulation, and individualized consideration behaviors exhibited by the supply chain leader create a style of leadership that may be classified as either transactional or transformational.

Supply chain followership (SCF) is also a relational, co-influencing concept between a supply chain follower organization and the supply chain leader based on the follower's willingness to acknowledge the leadership role of another organization. The relative level of thinking, responsibility, collaboration, and commitment behaviors exhibited by the supply chain follower organization creates a style of followership that is transactional or transformational.

Table 5.1 summarizes the behaviors expected of transformational and transactional supply chain followers. Transformational supply chain followers are expected to actively exhibit the four defining followership behaviors, often in ways that go well beyond the parameters of their original role. Transformational followers are characterized as more accepting of change and projecting behaviors that are generally more innovative, inclusive of the needs of other supply chain members (holistic), and based on mutually defined goals. Transactional supply chain follower organizations will also exhibit the four followership behaviors, but will minimize any extra activities that go beyond the scope of the (contractually) specified relationship. Transactional followers may resist change, and behave in ways that maximize the return to their own firm due to the primacy of firm-specific goals.

A supply chain leader and supply chain followers come together to form supply chain networks. The combination of leader and follower styles creates the style of

**Table 5.1: Comparing Transformational & Transactional Supply Chain Followers**

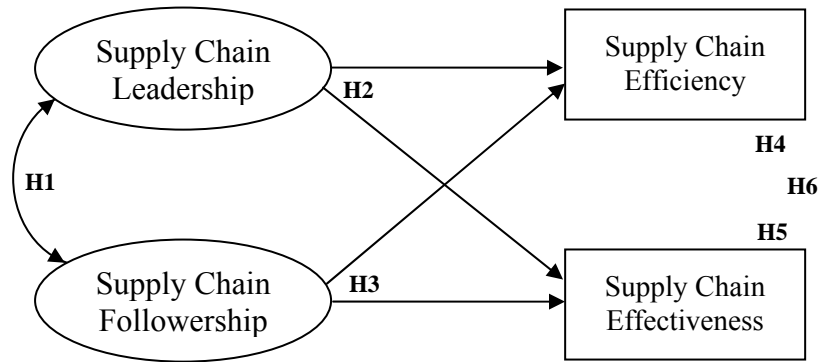
Characteristic	Transformational	Transactional
Thinking Style	<p><i>“Critical”</i></p> <ul style="list-style-type: none"> <li>• Seek innovative solutions</li> <li>• Champion change initiatives</li> </ul>	<p><i>“Directed”</i></p> <ul style="list-style-type: none"> <li>• Optimizes existing processes</li> <li>• Status quo</li> </ul>
Scope of Responsibility	<p><i>“Expanded”</i></p> <ul style="list-style-type: none"> <li>• Quality task completion</li> <li>• Extra-role activities</li> </ul>	<p><i>“Stable”</i></p> <ul style="list-style-type: none"> <li>• Solid in-role performance</li> <li>• Stay within defined scope</li> </ul>
Collaboration	<p><i>“Active”</i></p> <ul style="list-style-type: none"> <li>• Supports SC leader’s goals</li> <li>• Decisions benefit entire SC</li> <li>• Network of relationships</li> </ul>	<p><i>“Passive”</i></p> <ul style="list-style-type: none"> <li>• Accomplish own goals</li> <li>• Minimizes other org’s goals</li> <li>• Limited extra contacts</li> </ul>
Commitment	<p><i>“Group”</i></p> <ul style="list-style-type: none"> <li>• Accomplish shared goals</li> <li>• Supply chain-wide success</li> </ul>	<p><i>“Self”</i></p> <ul style="list-style-type: none"> <li>• Decisions benefit own firm only</li> <li>• Firm specific success</li> </ul>

interactions found in the supply chain. Thus, transactional leaders and followers form transactional supply chains while transformational leaders and followers form transformational supply chains. The “fit” of supply chain leader and follower style is expected to translate to overall performance. Thus, transactional and transformational supply chains made up of leaders and followers with matching styles should perform at a higher level than mismatched networks made up of differing leader and follower styles.

**PROPOSED MODEL**

Figure 5.1 presents the structural equation model and associated hypotheses. Supply chains in this research consist of a supply chain leader and one or more supply chain follower organization that form a co-influencing relationship (Grundstien-Amado 1999). The relationship is reinforced by the creation of shared goals (Kelley 2004; Kouzes and Posner 2004) and overlapping identities (Collinson 2006). The best

**Figure 5.1: Proposed Structural Equation Model**



performing supply chains contain a leader and followers sharing a similar strategic outlook (Defee and Stank 2005; Stank, Davis, and Fugate 2005), which may be viewed as the creation of complementary supply chain leadership and followership styles.

- H1:** When supply chain leaders and supply chain followers share a common style, there will be a high degree of inter-relationship between the two.

Processes found in transactional supply chains, consisting of a transactional supply chain leader and one or more transactional supply chain follower organization, are primarily defined by the supply chain leader (Maloni and Benton 2000). Leader-follower relationships are specified by arms-length arrangements (contracts) and tend to be focused on short-term activities and outcomes. This short-term view encourages transactional supply chain leaders to optimize their own performance without consideration of the potential to harm supply chain follower performance. The disproportionate influence of a transactional supply chain leader limits the opportunity of followers to impact performance. Transactional supply chain followers further minimize



their ability to improve supply chain performance by eschewing change, and focusing on their own internal goals as described in Table 5.1.

**H2:** In transactional supply chains, supply chain leaders will make a greater contribution to both efficient and effective performance outcomes than supply chain followers.

Transformational supply chains, made up of a transformational supply chain leader and one or more transformational supply chain follower organization, should envision the supply chain more holistically by establishing goals supported by both the leader and followers (Bass 1985; Kouzes and Posner 2004). Transformational supply chain leaders and followers should take a longer-term view of relationships because they share a vision of the future (Podsakoff, MacKenzie, and Bommer 1996). Each of these criteria suggest transformational supply chain organizations will be more amenable to a perceived need for change (Bass 1999; Potter, Rosenbach, and Pittman 2001).

Mentzer's (2001) definition suggests many supply chain follower organizations exist in a given supply chain compared to a single supply chain leader. The greater number of followers suggests they will perform the majority of tasks (Dixon and Westbrook 2003). Supply chain followers' impact on performance should be increased in transformational supply chains as the supply chain leader grants followers more latitude to improve processes and take on additional responsibilities (Avolio, Bass, and Jung 1999; Bass 1999). The more collaborative relationships found in transformational supply chains provides greater opportunity for supply chain followers to influence supply chain procedures and standards (Kelley 2004; Stank, Keller, and Daugherty 2001).

**H3:** In transformational supply chains, supply chain followers will make a greater contribution to both efficient and effective performance outcomes than supply chain leaders.

A primary goal of supply chain management is the improvement of end-to-end performance across the supply chain (Bowersox, Closs, and Cooper 2002; Mentzer 2004). Evaluation of holistic supply chain performance requires measures that span all members and incorporate multiple dimensions (Brewer and Speh 2000; Chow, Heaver, and Henriksson 1994). Holistic measurement of supply chain performance has rarely been used in research (Holmberg 2000; Lambert and Pohlen 2001), although measures of efficiency and effectiveness have been suggested to capture supply chain performance complexity (Mentzer 2004; Mentzer and Konrad 1991). Holistic measures of efficiency and effectiveness are used to gauge supply chain-wide performance in this research.

Research suggests the quantity of output (related to efficiency) may be of greater importance than the quality of output (related to effectiveness) in transactional supply chains (Jung and Avolio 2000; Masi and Cooke 2000). Transactional supply chain leaders and followers may be less willing to make significant changes, in part because of the shorter time frame under consideration. Therefore, improving effectiveness will not be a priority, and transactional supply chains should be more efficiency-oriented.

**H4:** Transactional supply chains will emphasize efficient performance over effective performance outcomes.

Transformational supply chains focus on effective operations supporting high end-customer service levels (Hoyt and Blascovich 2003) facilitated by holistic goals and rewards (Defee and Stank 2005). The emphasis on supply chain-wide goals and rewards motivates transformational supply chain leaders and followers to work collaboratively to create innovative process improvements (Bass and Avolio 1994). A collective improvement approach should result in more effective processes because the talents of

multiple organizations have been applied to the design, as opposed to the abilities of only the supply chain leader in a transactional supply chain. This suggests that networks with transformational structures will be more effective than those with transactional structures.

**H5:** Transformational supply chains will emphasize effective performance over efficient performance outcomes.

Research has consistently found transformational leaders facilitate higher performance than transactional leaders through greater follower satisfaction and motivation leading to extra effort (Sparks and Schenk 2001). Likewise, in transformational environments followers demonstrate greater commitment and interest in taking on extra-role tasks (Podsakoff et al. 2000). Transformational environments are characterized by the creation of shared goals between leader and followers (Bass 1999) and the establishment of holistic performance metrics (Brewer and Speh 2000). In contrast, firm-centric goals found in transactional supply chains encourage sub-optimization of overall supply chain performance (Lambert and Pohlen 2001). Thus, transformational supply chains are expected to outperform transactional supply chains on both efficiency and effectiveness dimensions.

**H6:** Transformational supply chains will demonstrate higher efficient and effective holistic performance outcomes than transactional supply chains.

## **METHODOLOGY**

Simulations provide for greater control over extraneous environmental factors (Kelton, Sadowski, and Sadowski 1998) and are appropriate when precision is a primary goal of research (Kerlinger and Lee 2000; McGrath, Martin, and Kula 1982). A methodology utilizing an interactive simulation, The Supply Chain Value game (Stank

2003), was used in this research to address the inherent complexity and potential for confounds present in supply chains, and to meet the research objective of developing valid and reliable scales of the previously untested SCL and SCF constructs.

The game has been used extensively in executive education programs for over a decade. Simulation outcomes are determined by the interactions of up to 30 participants who assume roles as managers and employees of supply chain companies across multiple echelons in the simulated environment including raw materials suppliers, manufacturers, distributors, retailers and the transportation links between each. The game takes place over two runs. The first run is analogous to a traditional “anticipatory” supply chain utilizing long-term demand forecasting and periodic promotions. The second run allows participants to incorporate reengineered processes that facilitate communication and allow companies to more rapidly respond to demand.

### **Sample and Data Collection Approach**

The sample was comprised of 253 experienced supply chain managers from 12 deliveries of the simulation in executive education courses. Although all participants had prior real world supply chain experience, responses were based entirely on their experience in the simulation environment. Managers and executives comprised 72% of the sample with the remaining 28% comprised of analysts and support staff. Thirty four percent of participants reported over 11 years of supply chain experience, 24% had worked in supply chain roles between 6-10 years, and 24% had 2-5 years of related experience. Participants came from many types of supply chain organizations including retailers (45%), distributors (24%) and transportation companies (10%). Complete sample demographics are shown in Appendix B.

Two surveys were completed by each participant (one at the end of each simulation run). A total of 502 surveys were collected (253 for run 1, and 249 for run 2). Non-response bias was not considered an issue as over 99% of participants completed both surveys. Participants were asked to skip questions relating to behaviors they did not observe in the simulation. This instruction may have contributed to an increase in the amount of missing data. Surveys containing more than 25% of the items unanswered were dropped, leaving 473 cases (239 in run 1, and 234 in run 2) in the final dataset. Expectation-Maximization was used to replace missing values (1.4% of responses in the reduced dataset). Tests of means and standard deviations showed the reduced dataset was not significantly different from the dataset containing imputed values.

### **Initial Scale Development and Pilot Testing**

Scales were developed following the process outlined by Churchill (1979) and Dunn, Seaker, and Waller (1994). Because the constructs of SCL and SCF had not been tested in supply chain research, both scales included a combination of items adapted from existing leadership and followership scales, and newly developed items intended to ensure full coverage of the construct domains. Several SCL items were adapted from the Multifactor Leadership Questionnaire (Avolio and Bass 2004). Many of the SCF items were adapted from Kelley's (1992) Effective Followership questionnaire.

Each construct is described by the behavioral domains presented earlier (SCL: inspiration, intellectual stimulation, and individualized consideration; SCF: thinking, responsibility, collaboration, and commitment). New items were developed to ensure the behaviors were adequately covered by multiple items and to establish a larger pool of potential items for each construct. In total, 45 SCL items and 43 SCF items were

iteratively reviewed by 12 subject matter experts to ensure item specificity, representativeness, readability and face validity. Four items were re-worded as a result of the review, and five items were dropped and replaced with additional new items.

All 88 SCL and SCF items were pilot tested with a group of 25 simulation participants, who were not part of the final sample. The purpose of the pilot test was to identify poor performing items rather than create highly purified scales. Full construct validity was examined using the final sample, and is described subsequently. Coefficient alpha was used to examine inter-item reliability (Churchill 1979) based on the pilot test dataset. Items were scrutinized across both the run 1 (transactional environment) and run 2 (transformational environment) datasets. To be retained in a scale, items had to demonstrate reliability across both groups and exceed the recommended .70 cutoff for alpha (Churchill 1979; Garver and Mentzer 1999). The scales were reduced to a 17-item SCL scale and a 29-item SCF scale. A rotated factor analysis produced a two factor solution as anticipated with the items from each scale loading on separate factors.

## **RESULTS**

### **Measurement Model Analysis**

Confirmatory factory analysis (CFA) was used to determine construct validity including testing for unidimensionality, reliability, convergent validity and discriminant validity (Garver and Mentzer 1999). Data from the final sample were analyzed using AMOS 7 structural equation modeling software. A separate CFA was performed on each scale independently in order to facilitate scale purification before combing the SCL and SCF constructs in the full measurement model. A lambda-equivalent technique was used to ensure items were given equal weight across both groups.

Unidimensionality and convergent validity were assessed by the direction, magnitude and significance ( $\alpha \leq .05$ ) of each item and its focal construct (Hulland, Chow, and Lam 1996). Items with standardized residuals greater than 2.0 and modification indices of 10 or more were identified as candidates for deletion (Medsker, Williams, and Holahan 1994; Steenkamp and Trijp 1991). One item in each scale was retained despite a marginal path weight. Item Q5 of the SCL scale (My supply chain leader articulates a compelling vision of the supply chain's future) had a path weight of .69 for the transformational group. Item Q37 of the SCF scale (My company independently thinks up new ideas that contribute to supply chain goals) had a path weight of .69 in the transactional group. Both items were retained because they were necessary to tap the theoretical construct domains. Convergent validity was confirmed using these criteria and resulted in the creation of a 7-item SCL scale and a 10-item SCF scale.

Discriminant validity was tested by comparing the average variance extracted (AVE) to the largest shared variance between pairs of constructs (Fornell and Larcker 1981). AVE exceeded shared variance in each case, confirming SCL and SCF discriminate adequately. Scale reliability was confirmed for both constructs with SEM construct reliabilities greater than .70 and AVE greater than .50 (Garver and Mentzer 1999). Overall measurement model fit for the two construct model of SCL and SCF was very good ( $\chi^2 = 420.72$  at 251 degrees of freedom, root mean square error of approximation [RMSEA] = .04, comparative fit index [CFI] = .97, Tucker-Lewis index [TLI] = .97). Summary construct validity results are shown in Tables 5.2 and 5.3.

Opportunism (OPP) (Moore and Cunningham 1999) was included in the survey as an additional construct not theoretically related to SCL or SCF to test for common

**Table 5.2: Construct Validity Measures (Transactional Group)**

<b>Construct</b>	<b>Item</b>	<b>Std Item Loading</b>	<b>Sq Mult Corr</b>	<b>Construct Reliability</b>	<b>Coeff Alpha</b>	<b>AVE</b>	<b>Highest Shared Variance</b>
SCL	Q5	0.70	0.50	0.94	0.94	69%	28%
	Q9	0.79	0.62				
	Q10	0.81	0.66				
	Q11	0.88	0.77				
	Q13	0.91	0.82				
	Q17	0.90	0.80				
	Q26	0.82	0.66				
SCF	Q37	0.69	0.48	0.95	0.94	64%	28%
	Q41	0.72	0.53				
	Q43	0.82	0.67				
	Q45	0.79	0.62				
	Q47	0.87	0.75				
	Q50	0.84	0.71				
	Q51	0.77	0.59				
	Q54	0.80	0.64				
	Q56	0.84	0.70				
	Q59	0.85	0.72				
OPP	Q83	0.78	0.62	0.91	0.91	71%	1%
	Q84	0.86	0.75				
	Q85	0.87	0.76				
	Q86	0.86	0.74				



**Table 5.3: Construct Validity Measures (Transformational Group)**

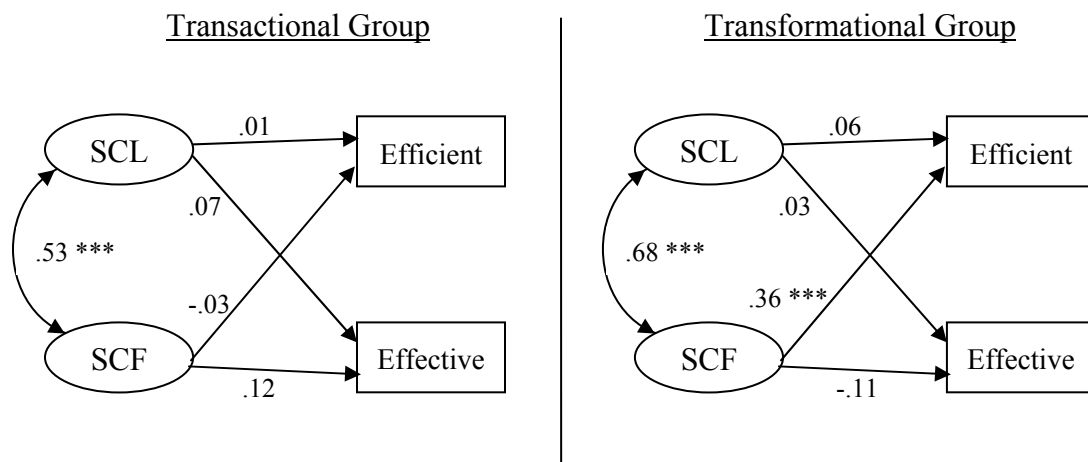
<b>Construct</b>	<b>Item</b>	<b>Std Item Loading</b>	<b>Sq Mult Corr</b>	<b>Construct Reliability</b>	<b>Coeff Alpha</b>	<b>AVE</b>	<b>Highest Shared Variance</b>
SCL	Q5	0.70	0.48	0.92	0.92	61%	46%
	Q9	0.80	0.64				
	Q10	0.78	0.61				
	Q11	0.80	0.65				
	Q13	0.80	0.63				
	Q17	0.78	0.61				
	Q26	0.81	0.65				
SCF	Q37	0.70	0.48	0.95	0.95	65%	46%
	Q41	0.71	0.50				
	Q43	0.83	0.68				
	Q45	0.82	0.68				
	Q47	0.85	0.71				
	Q50	0.85	0.73				
	Q51	0.79	0.62				
	Q54	0.82	0.68				
	Q56	0.84	0.70				
	Q59	0.83	0.69				
OPP	Q83	0.86	0.74	0.94	0.95	81%	0%
	Q84	0.91	0.82				
	Q85	0.94	0.89				
	Q86	0.89	0.80				

method bias (Lindell and Whitney 2001). A model with SCL and SCF loading onto a second-order construct was compared with a similar model that also included OPP. The model excluding OPP demonstrated better fit, and in the alternate model only the path to OPP was not significant ( $p \leq .001$ ), suggesting common method bias was not present.

### Analysis of the Structural Model

The structural model was analyzed using the refined scales and maximum likelihood estimation. The structural model also demonstrated good fit and required no further modification ( $\chi^2 = 524.66$  at 312 degrees of freedom, RMSEA = .04, CFI = .97, TLI = .96). As shown in Figure 5.2, SCL and SCF showed a high degree of interaction with significant covariance paths ( $p \leq .001$ ) in both the transactional (.53) and transformational (.68) environments providing support for H<sub>1</sub>. Supply chain leadership and supply chain followership appear to be highly interrelated concepts.

**Figure 5.2: Standardized Path Weights**



\* Statistically significant at the  $\alpha = .05$  level  
 \*\* Statistically significant at the  $\alpha = .01$  level  
 \*\*\* Statistically significant at the  $\alpha = .001$  level

The effects of SCL and SCF on EFFICIENT and EFFECTIVE performance in both the transactional (H<sub>2</sub>) and transformational (H<sub>3</sub>) environments are examined next using a two-stage analysis. In the first stage, the complete model is tested separately for each environment to identify significant paths (see Figure 5.2). The second testing stage requires the development of post hoc models constraining the weights of significant paths to equal zero. A significant chi-square difference test between the original model and a constrained model allows a conclusion that the models are not equivalent, and the path with the higher weight is relatively stronger.

Interestingly, no paths were significant in the transactional environment, and H<sub>2</sub> is not supported. The contribution of the supply chain leader and supply chain followers to holistic performance cannot be distinguished in the transactional environment. This result is surprising because the leadership literature is built on the expectation that leadership is a primary driver of performance outcomes. A possible explanation for this result is that transactional supply chain leaders are expected to optimize their own performance, and by doing so may sub-optimize holistic performance (Holmberg 2000). Firm-level performance was not measured in this research, and could provide additional insight through comparison to holistic performance in future endeavors.

In the transformational group only the SCF to EFFICIENT path was found to be significant. This result provides partial support for H<sub>3</sub>, and the comparative post hoc test is not needed to conclude supply chain followers make a greater contribution to holistic efficient performance than the supply chain leader. The relative contribution of supply chain followers and the supply chain leader on the holistic effective performance dimension cannot be determined in the transformational environment. Supply chain

leaders are posited to give greater decision-making and innovation responsibilities to capable supply chain followers in a transformational relationship, providing greater opportunity for supply chain followers to have a direct impact on performance.

**Analysis of Performance**

Both performance measures were captured objectively as outcomes of each simulation run. Efficient performance was measured as the percentage of expedited freight (of total freight moves) used to support delivery requirements for all customers across the supply chain. Effective performance was measured as the percentage of orders judged to be “perfect” by end customers (e.g., only orders received with the right product, in the right quantity, at the right time, at the right location, and without any damage). Performance results captured in the simulation are presented in Figure 5.3.

The three performance hypotheses are explored outside the structural model. H<sub>4</sub> and H<sub>5</sub> compare the performance dimensions within each of the environments (transactional and transformational), and are tested using a paired samples t-test. H<sub>4</sub> is

**Figure 5.3: Simulation Performance Results**

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	Efficiency	Effectiveness
Transactional	68%	16%
Transformational	83%	93%

---

supported ( $t = 37.26, p \leq .001$ ). In transactional supply chains EFFICIENT performance is significantly greater than EFFECTIVE performance when both performance dimensions are considered holistically.  $H_5$  is also supported ( $t = 15.10, p \leq .001$ ). In transformational supply chain environments EFFECTIVE performance is significantly greater than EFFICIENT performance.  $H_6$  compares performance between the two environments, and is tested using an independent samples t-test.  $H_6$  is fully supported providing empirical support that both EFFICIENT ( $t = 15.54, p \leq .001$ ) and EFFECTIVE ( $t = 92.40, p \leq .001$ ) performance are improved in transformational supply chains.

## **IMPLICATIONS AND CONCLUSIONS**

Supply chain followership is an important, essentially unexplored concept that may be used to better understand the relationships established between supply chain members. SCF should not be considered to be a stand-alone concept and is best described in the context of supply chain leadership. This research developed the first definition of supply chain followership and linked SCF to holistic efficient performance.

The findings point out several preliminary implications for managers. First, supply chain leaders have typically been conceptualized as the most dominant firm in the supply chain (Maloni and Benton 2000). While power must be considered in the evaluation of a supply chain leader it should not be the sole consideration. In line with transformational leadership theory, the research findings suggest the supply chain leader can be identified on the basis of the organizational behaviors exhibited. The implication of this for managers is that non-leader organizations may re-position themselves to become a supply chain leader by projecting a specific set of leadership behaviors. Many organizations do not possess the capabilities of becoming a supply chain leader, or may

prefer to contribute in the role of supply chain follower. The research findings suggest the follower's role is critical to overall supply chain performance, especially in a transformational environment. Transformational supply chain followers make a significant contribution to performance, and fulfilling a value-adding follower's role provides a better outcome than a failed attempt to assume a leadership role.

Managers of both supply chain leader and follower organizations should be aware of the style of leadership/followership projected by their company. The fit of that style with other members may be a determining factor in overall supply chain performance. Firms may interact best when teamed with leaders and followers demonstrating a similar style, whether transactional or transformational. When managers conclude their organization is part of a supply chain containing both transactional and transformational organizations, they should consider changing their own behaviors to better match the styles of other members, encourage other members to adjust their styles, or identify new partners that are a better fit.

Managers should also be sensitive to the style of the resulting supply chain network. Transformational supply chains should function better in stable environments, and may be a better style when efficiency is significantly more important than customer service (e.g. effectiveness). Transformational supply chains may be more adept at innovation and navigating a path through rapidly changing environments. When customers place a premium on service, transformational supply chain leader and follower styles may be more appropriate. Importantly, the findings suggest transformational supply chains significantly outperform transactional supply chains on both of the performance dimensions examined.

A description of the characteristics that may be used to describe supply chain leaders and supply chain followers has been lacking. The definitions of SCL and SCF and creation of valid and reliable scales developed in this research make a theoretical contribution to the field. In addition, it is important to understand that variability in behavior can be used to classify supply chain leaders and followers into differing styles (transactional versus transformational). This conclusion is particularly important for researchers because supply chain followers have often been viewed as an undifferentiated mass of firms subject to the directives of the supply chain leader. Future investigations may examine additional behaviors that may assist in further classifying supply chain followers. Specifically, follow-on research may augment the findings of this research by identifying other SCF styles beyond the purely transactional or transformational styles examined here.

The purpose of this research was to explore and theoretically conceptualize supply chain followership. The findings presented provide an initial investigation into the concept. As with any single investigation this research has limitations (McGrath 1982). The use of interactive simulation facilitated greater control over supply chain conditions and proved useful in developing valid and reliable scales of the constructs of interest. Additional research, using a variety of methods, is needed before generalizing the results to a wider population. The design of this research compared transactional supply chain leaders and followers to transformational supply chain leaders and followers. Conclusions drawn must be limited to these pure forms, and cannot be extrapolated across other configurations such as mismatched supply chains, i.e., transactional leaders with transformational followers and vice versa.

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## APPENDICES

## **APPENDIX A**

- A.1 List of Pre-test Items**
- A.2 Pre-test Survey**

Construct / Item	Source	#	Mod
<b><u>LEADERSHIP CONSTRUCTS &amp; ITEMS</u></b>			
<i>The supply chain leader...</i>			
<u>Inspirational Behavior (IBL)</u>			
1 Is enthusiastic about what needs to be accomplished by the supply chain	Avolio & Bass (2004)	13	Y
2 Articulates a compelling vision of the supply chain's future	Avolio & Bass (2004)	26	Y
3 Expresses confidence that supply chain goals will be achieved	Avolio & Bass (2004)	36	Y
4 Shares its views on the most important values and beliefs	Avolio & Bass (2004)	6	Y
5 Specifies the importance of having a shared sense of purpose	Avolio & Bass (2004)	14	
6 Considers the consequences of how decisions affect other supply chain members	Avolio & Bass (2004)	23	Y
7 Emphasizes the importance of having a collective sense of mission	Avolio & Bass (2004)	34	
8 Clarifies the central purpose underlying actions of all supply chain members	Avolio & Bass (2004)	63	Y
9 Expects high performance from all supply chain members	New		
10 Does not explain performance expectations	New		
<u>Intellectual Stimulation (ISL)</u>			
1 Seeks differing perspectives from my company when solving problems	Avolio & Bass (2004)	8	Y
2 Gets my company to look at problems from many different angles	Avolio & Bass (2004)	30	Y
3 Encourages my company to express ideas and opinions	Avolio & Bass (2004)	65	Y
4 Asks my company to contribute ideas for improving supply chain problems	New		
5 Promotes creativity from my company	New		
6 Helps my company develop more creative solutions to supply chain problems	New		
7 Does not want me to change processes that work	New		
8 Rejects ideas I present that are intended to improve processes	New		
<u>Individualized Consideration (ICL)</u>			
1 Treats my company as distinct from other supply chain members	Avolio & Bass (2004)	19	Y
2 Considers my company as having different needs and abilities than other supply chain members	Avolio & Bass (2004)	29	Y
3 Helps my company develop supply chain execution strengths	Avolio & Bass (2004)	31	Y
4 Provides useful advice to help my company improve	Avolio & Bass (2004)	29	Y

## List of Items for Pre-test

Appendix A.1

Construct / Item		Source	#	Mod
5	Is effective in mentoring my company to become a better contributor to supply chain success	New		
6	Uses my company's skills to the supply chain's best advantage	New		
7	Understands my company's capabilities are different from others	New		
8	Encourages my company to continually improve its supply chain skills	New		
9	Assumes all supply chain members have the same abilities	New		
<u>Contingent Reward (CRL)</u>				
1	Provides my company with assistance in exchange for our efforts	Avolio & Bass (2004)	1	Y
2	Defines which company is responsible for achieving specific performance targets	Avolio & Bass (2004)	11	Y
3	Makes clear what my company should expect when performance goals are achieved	Avolio & Bass (2004)	16	Y
4	Ensures that my company receives appropriate rewards for achieving performance targets	Avolio & Bass (2004)	56	Y
5	Explains what my company must do to be rewarded for our efforts	Avolio & Bass (2004)	48	Y
6	Clearly communicates performance standards associated with my company's rewards	New		
7	Applies punishments when my company's performance drops below expectations	New		
8	Does not connect my level of performance with rewards	New		
9	Is not clear in explaining the rewards for achieving performance targets	New		
<u>Management-by-Exception (MEL)</u>				
1	Focuses attention on my company's irregularities and mistakes	Avolio & Bass (2004)	4	Y
2	Concentrates full attention on dealing with my company's failures	Avolio & Bass (2004)	22	Y
3	Keeps track of all my company's mistakes	Avolio & Bass (2004)	24	Y
4	Directs my company's attention toward failures to meet standards	Avolio & Bass (2004)	27	Y
5	Searches for mistakes before commenting on my company's performance	Avolio & Bass (2004)	54	Y
6	Focuses attention on my company's deviations from standards	New		
7	Strives to uncover performance exceptions in my company	New		
8	Identifies performance failures and takes corrective action	New		
9	Rarely makes suggestions for correcting performance problems	New		

Construct / Item	Source	#	Mod
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### FOLLOWERSHIP CONSTRUCTS AND ITEMS

#### *My organization...*

##### Independent Mindset (IMF)

1	May question the supply chain leader's wisdom rather than simply doing what we're told	Kelley (1992)	17	Y
2	Declines to follow the supply chain leader's directions when it is contrary to our own values	Kelley (1992)	18	Y
3	Asserts our views on important issues, even when it might cause conflict with the supply chain leader	Kelley (1992)	20	Y
4	Knows what to do to help the supply chain achieve its performance goals	New		
5	Acts with integrity in all business dealings with the supply chain leader	New		
6	Makes supply chain related decisions in line with our set of important values	New		
7	Readily accepts the supply chain leader's direction without regard to our own values	New		
8	Makes the best business decision at the time regardless of prior commitments	New		

##### Critical Thinking (CTF)

1	Identifies critical supply chain activities without waiting for direction from the supply chain leader	Kelley (1992)	5	Y
2	Independently thinks up new ideas that contribute to supply chain goals	Kelley (1992)	11	Y
3	Tries to solve tough problems rather than look to the supply chain leader to do it	Kelley (1992)	12	Y
4	Often looks for better ways to accomplish a supply chain task	New		
5	Responds to supply chain problems with creative solutions	New		
6	Champions the need for change in the supply chain	New		
7	Actively participates in supply chain change projects	New		
8	Prefers to keep executing stable supply chain processes rather than developing new ones	New		
9	Depends on the supply chain leader to determine what should be done next	New		

##### Assume Responsibility (ARF)

1	Builds a record of success in tasks important to the supply chain leader	Kelley (1992)	7	Y
2	Accepts difficult assignments without the benefit of supervision from the supply chain leader	Kelley (1992)	8	Y
3	Meets supply chain deadlines with the highest quality of work	Kelley (1992)	8	Y
4	Seeks out and completes assignments that go above and beyond what's required	Kelley (1992)	9	Y
5	Assesses its supply chain performance objectively	New		
6	Makes sound decisions that benefit the entire supply chain	New		

## List of Items for Pre-test

Appendix A.1

Construct / Item		Source	#	Mod
7	Completes our supply chain responsibilities accurately and on-time	New		
8	Tries to off-load work from the supply chain leader	New		
9	Never takes on additional responsibilities	New		Y
10	Frequently performs poorly on assigned tasks	New		Y
<u>Collaborate with Leader (COF)</u>				
1	Understands the supply chain leader's needs and goals	Kelley (1992)	15	Y
2	Works hard to support the supply chain leader's goals	Kelley (1992)	15	Y
3	Develops a network of relationships with other supply chain members	New		
4	Tries to continually improve our relationship with the supply chain leader	New		
5	Strives to accomplish goals that have been mutually defined with the supply chain leader	New		
6	Calls on other supply chain members who possess more knowledge when our skills are limited in a certain area	New		
7	Prefers to stick to our own work	New		
8	Does not try to develop a deeper relationship with the supply chain leader	New		
<u>Supply Chain Commitment (CMF)</u>				
1	Demonstrates commitment to overall supply chain success	Kelley (1992)	3	Y
2	Gives our ideas freely to the supply chain leader	Kelley (1992)	3	Y
3	Enthusiastically supports the efforts of the supply chain leader	Kelley (1992)	4	Y
4	Contributes at a high level when not in a leadership position	Kelley (1992)	10	Y
5	Creates a shared purpose with the supply chain leader	New		
6	Challenges the supply chain leader when it makes decisions that negatively effect overall supply chain performance	New		
7	Agrees with the supply chain leader's decisions, even when it may harm overall supply chain performance	New		
8	Is not interested in the supply chain leader's goals	New		

**SC STRUCTURE CONSTRUCTS AND ITEMS***In this supply chain...*Information Systems (INF)

1	My company possesses the information needed to rapidly respond to customer requests	Fawcett, Stanly & Smith (1997)	LF3	Y
2	My company possesses the information needed to minimize customer complaints	Fawcett, Stanly & Smith (1997)	LQ3	Y
3	My company possesses the information needed to handle unexpected events	Fawcett, Stanly & Smith (1997)	LF2	Y
4	My company possesses the information needed to effectively plan supply chain tasks	New		

## List of Items for Pre-test

Appendix A.1

Construct / Item		Source	#	Mod
5	My company possesses the information needed to accurately fulfill customer orders	New		
6	My company possesses the information needed to control operating costs	New		
7	My company can rely on the order volume information provided by the supply chain leader	New		
8	My company can rely on the order volume information provided by other supply chain members	New		
<u>Communications (COM)</u>				
1	We coordinate our activities with the supply chain leader through formal communications channels	Mohr, Fisher & Nevin (1996)	1	Y
2	Formal requirements for communication are established by the supply chain leader	New		
3	The supply chain leader communicates with my company on a predetermined schedule	New		
4	My company must report status to the supply chain leader each period	New		
5	The supply chain leader requires my company to comply with their reporting schedule	New		
6	My company frequently discusses issues informally with the supply chain leader	Li & Dant (1997)	2	Y
7	My company feels comfortable calling on the supply chain leader when the need arises	Menon, Jaworski & Kohli (1997)	3	Y
8	The supply chain leader does not set rules for how or when communication occurs	New		
<u>Decision-Making (DEC)</u>				
1	Little action can be taken until the supply chain leader approves a decision	Mollenkopf, Gibson & Ozanne (2000)	C1	Y
2	Even small matters must be referred to the supply chain leader before my company takes action	Mollenkopf, Gibson & Ozanne (2000)	C2	Y
3	My company is constantly being monitored for rule violations by the supply chain leader	Mollenkopf, Gibson & Ozanne (2000)	C3	Y
4	Supply chain decision-making is highly concentrated with the supply chain leader	Williams (1994)	C1	Y
5	My company has freedom to make decisions that may improve supply chain performance	New		
6	My company makes supply chain decisions without the leader's authorization	New		
7	Supply chain decision-making is distributed across many supply chain members	New		



## List of Items for Pre-test

Appendix A.1

Construct / Item	Source	#	Mod
<u>Rewards (REW)</u>			
1 All supply chain members are rewarded for working together to meet customers' needs	Mollenkopf, Gibson & Ozanne (2000)	R1	Y
2 Incentives for working with other firms are made available to my company	Mollenkopf, Gibson & Ozanne (2000)	R2	Y
3 Performance evaluation is partly based on end-customer feedback	Mollenkopf, Gibson & Ozanne (2000)	R5	Y
4 Rewards are based in part on integration of objectives across all supply chain member firms	Mollenkopf, Gibson & Ozanne (2000)	R6	Y
5 My company is rewarded for how well we meet our own goals	New		
6 My own company's performance determines our level of rewards	New		
7 Rewards are passed out to the best performing firms in the supply chain	New		
8 The supply chain leader determines the level of my company's rewards	New		

**INSTRUCTIONS:**

The following questions relate to your just-completed experience in the Supply Chain Value game. When answering the questions, please keep the following points in mind:

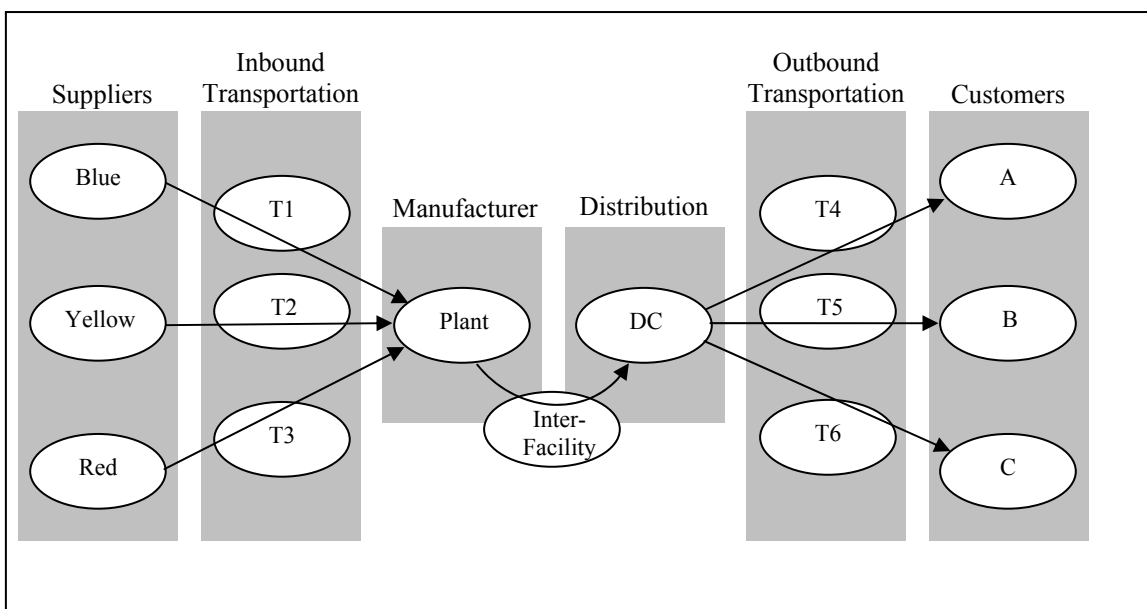
- You determine the **supply chain leader** based on your experience in the game.
- **My company** is the role you played in the game.
- **This supply chain** refers to all participants in the game just completed.
- **Supply chain members** are all companies represented in the supply chain.

Please try to answer each question. However, do not guess just to provide a response. If you cannot honestly answer a question please follow these rules:

- If you have no basis to answer the question, circle the question number and write **NB** in the left margin.
- If you can't understand the question, circle the question number and write a ? in the left margin.
- If you can't answer for some other reason, circle the question number and **write a few words of explanation** in the left margin or on the back of the page.

**SECTION 1: Identify the supply chain leader**

1. Circle the company you consider to be the supply chain leader in the diagram below.
2. Mark an "X" through your own company.



**SECTION 2: Characteristics of the supply chain leader**

Judge how frequently each descriptive statement fits the supply chain leader using the following scale.

Not at all	Once in a while	Sometimes	Fairly often	Frequently
1	2	3	4	5

***My supply chain leader...***

1	Is enthusiastic about what needs to be accomplished by the supply chain	1	2	3	4	5
2	Articulates a compelling vision of the supply chain's future	1	2	3	4	5
3	Expresses confidence that supply chain goals will be achieved	1	2	3	4	5
4	Shares its views on the most important values and beliefs	1	2	3	4	5
5	Specifies the importance of having a shared sense of purpose	1	2	3	4	5
6	Does not explain performance expectations	1	2	3	4	5
7	Considers the consequences of how decisions affect other supply chain members	1	2	3	4	5
8	Emphasizes the importance of having a collective sense of mission	1	2	3	4	5
9	Clarifies the central purpose underlying actions of all supply chain members	1	2	3	4	5
10	Expects high performance from all supply chain members	1	2	3	4	5
11	Seeks differing perspectives from my company when solving problems	1	2	3	4	5
12	Gets my company to look at problems from many different angles	1	2	3	4	5
13	Does not want me to change processes that work	1	2	3	4	5
14	Encourages my company to express ideas and opinions	1	2	3	4	5
15	Asks my company to contribute ideas for improving supply chain problems	1	2	3	4	5
16	Promotes creativity from my company	1	2	3	4	5
17	Rejects ideas I present that are intended to improve processes	1	2	3	4	5
18	Helps my company develop more creative solutions to supply chain problems	1	2	3	4	5
19	Treats my company as distinct from other supply chain members	1	2	3	4	5
20	Considers my company as having different needs and abilities than other supply chain members	1	2	3	4	5
21	Helps my company develop supply chain execution strengths	1	2	3	4	5
22	Provides useful advice to help my company improve	1	2	3	4	5
23	Is effective in mentoring my company to become a better contributor to supply chain success	1	2	3	4	5
24	Assumes all supply chain members have the same abilities	1	2	3	4	5
25	Uses my company's skills to the supply chain's best advantage	1	2	3	4	5
26	Understands my company's capabilities are different from others	1	2	3	4	5
27	Encourages my company to continually improve its supply chain skills	1	2	3	4	5
28	Provides my company with assistance in exchange for our efforts	1	2	3	4	5
29	Defines which company is responsible for achieving specific performance targets	1	2	3	4	5
30	Makes clear what my company should expect when performance goals are achieved.	1	2	3	4	5

Pre-Test Survey

Appendix A.2

Judge how frequently each descriptive statement fits the supply chain leader using the following scale.

Not at all	Once in a while	Sometimes	Fairly often	Frequently
1	2	3	4	5

***My supply chain leader...***

31	Does not connect my level of performance with rewards	1	2	3	4	5
32	Ensures that my company receives appropriate rewards for achieving performance targets	1	2	3	4	5
33	Explains what my company must do to be rewarded for our efforts	1	2	3	4	5
34	Clearly communicates performance standards associated with my company's rewards	1	2	3	4	5
35	Is not clear in explaining the rewards for achieving performance targets	1	2	3	4	5
36	Applies punishments when my company's performance drops below expectations	1	2	3	4	5
37	Focuses attention on my company's irregularities and mistakes	1	2	3	4	5
38	Concentrates full attention on dealing with my company's failures	1	2	3	4	5
39	Keeps track of all my company's mistakes	1	2	3	4	5
40	Directs my company's attention toward failures to meet standards	1	2	3	4	5
41	Rarely makes suggestions for correcting performance problems	1	2	3	4	5
42	Searches for mistakes before commenting on my company's performance	1	2	3	4	5
43	Focuses attention on my company's deviations from standards	1	2	3	4	5
44	Strives to uncover performance exceptions in my company	1	2	3	4	5
45	Identifies performance failures and takes corrective action	1	2	3	4	5

**SECTION 3: Characteristics of your role**

Judge how frequently each descriptive statement fits your company using the following scale.

Not at all	Once in a while	Sometimes	Fairly often	Frequently
1	2	3	4	5

***My company...***

46	May question the supply chain leader's wisdom rather than simply doing what we're told	1	2	3	4	5
47	Declines to follow the supply chain leader's directions when it is contrary to our own values	1	2	3	4	5
48	Readily accepts the supply chain leader's direction without regard to our own values.	1	2	3	4	5
49	Asserts our views on important issues, even when it might cause conflict with the supply chain leader	1	2	3	4	5
50	Knows what to do to help the supply chain achieve its performance goals	1	2	3	4	5
51	Acts with integrity in all business dealings with the supply chain leader	1	2	3	4	5
52	Makes the best business decision at the time regardless of prior commitments	1	2	3	4	5

Pre-Test Survey

Appendix A.2

Judge how frequently each descriptive statement fits your company using the following scale.

Not at all	Once in a while	Sometimes	Fairly often	Frequently
1	2	3	4	5

***My company...***

53	Makes supply chain related decisions in line with our set of important values	1	2	3	4	5
54	Identifies critical supply chain activities without waiting for direction from the supply chain leader	1	2	3	4	5
55	Independently thinks up new ideas that contribute to supply chain goals	1	2	3	4	5
56	Prefers to keep executing stable supply chain processes rather than developing new ones	1	2	3	4	5
57	Tries to solve tough problems rather than look to the supply chain leader to do it	1	2	3	4	5
58	Often looks for better ways to accomplish a supply chain task	1	2	3	4	5
59	Responds to supply chain problems with creative solutions	1	2	3	4	5
60	Depends on the supply chain leader to determine what will be done next	1	2	3	4	5
61	Champions the need for change in the supply chain	1	2	3	4	5
62	Actively participates in supply chain change projects	1	2	3	4	5
63	Builds a record of success in tasks important to the supply chain leader	1	2	3	4	5
64	Accepts difficult assignments without the benefit of supervision from the supply chain leader	1	2	3	4	5
65	Meets supply chain deadlines with the highest quality of work	1	2	3	4	5
66	Never takes on additional responsibilities	1	2	3	4	5
67	Seeks out and completes assignments that go above and beyond what's required	1	2	3	4	5
68	Assesses its supply chain performance objectively	1	2	3	4	5
69	Makes sound decisions that benefit the entire supply chain	1	2	3	4	5
70	Frequently performs poorly on assigned tasks	1	2	3	4	5
71	Completes our supply chain responsibilities accurately and on-time	1	2	3	4	5
72	Tries to off-load work from the supply chain leader	1	2	3	4	5
73	Understands the supply chain leader's needs and goals	1	2	3	4	5
74	Works hard to support the supply chain leader's goals	1	2	3	4	5
75	Prefers to stick to our own work	1	2	3	4	5
76	Develops a network of relationships with other supply chain members	1	2	3	4	5
77	Tries to continually improve our relationship with the supply chain leader	1	2	3	4	5
78	Does not try to develop a deeper relationship with the supply chain leader	1	2	3	4	5
79	Strives to accomplish goals that have been mutually defined with the supply chain leader	1	2	3	4	5
80	Calls on other supply chain members who possess more knowledge when our skills are limited in a certain area	1	2	3	4	5
81	Demonstrates commitment to overall supply chain success	1	2	3	4	5
82	Gives our ideas freely to the supply chain leader	1	2	3	4	5
83	Agrees with the supply chain leader's decisions, even when it may harm overall supply chain performance	1	2	3	4	5

Judge how frequently each descriptive statement fits your company using the following scale.

Not at all	Once in a while	Sometimes	Fairly often	Frequently
1	2	3	4	5

***My company...***

84	Enthusiastically supports the efforts of the supply chain leader	1	2	3	4	5
85	Contributes at a high level when not in a leadership position	1	2	3	4	5
86	Is not interested in the supply chain leader's goals	1	2	3	4	5
87	Creates a shared purpose with the supply chain leader	1	2	3	4	5
88	Challenges the supply chain leader when it makes decisions that negatively effect overall supply chain performance	1	2	3	4	5

**SECTION 4: Characteristics of the supply chain**

Judge how frequently each statement fits the entire supply chain using the following scale.

Not at all	Once in a while	Sometimes	Fairly often	Frequently
1	2	3	4	5

***In this supply chain...***

89	My company possesses the info needed to rapidly respond to customer requests	1	2	3	4	5
90	My company possesses the info needed to min. customer complaints	1	2	3	4	5
91	My company possesses the info needed to handle unexpected events	1	2	3	4	5
92	My company possesses the info needed to effectively plan supply chain tasks	1	2	3	4	5
93	My company possesses the info needed to accurately fulfill customer orders	1	2	3	4	5
94	My company possesses the info needed to control operating costs	1	2	3	4	5
95	My company can rely on the order volume information provided by the supply chain leader	1	2	3	4	5
96	My company can rely on the order volume information provided by other supply chain members	1	2	3	4	5
97	We coordinate our activities with the supply chain leader through formal communications channels	1	2	3	4	5
98	Formal requirements for communication are established by the supply chain leader	1	2	3	4	5
99	The supply chain leader communicates with my company on a predetermined schedule	1	2	3	4	5
100	My company must report status to the supply chain leader each period	1	2	3	4	5
101	The supply chain leader requires my company to comply with their reporting schedule	1	2	3	4	5
102	My company frequently discusses issues informally with the supply chain leader	1	2	3	4	5
103	My company feels comfortable calling on the supply chain leader when needed	1	2	3	4	5
104	The supply chain leader does not set rules for how or when communication occurs	1	2	3	4	5

Pre-Test Survey

Appendix A.2

Judge how frequently each statement fits the entire supply chain using the following scale.

Not at all	Once in a while	Sometimes	Fairly often	Frequently
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

***In this supply chain...***

105	Little action can be taken until the supply chain leader approves a decision	1	2	3	4	5
106	Even small matters must be referred to the supply chain leader before my company takes action	1	2	3	4	5
107	My company is constantly being monitored for rule violations by the supply chain leader	1	2	3	4	5
108	Supply chain decision-making is highly concentrated with the supply chain leader	1	2	3	4	5
109	My company has freedom to make decisions that may improve supply chain performance	1	2	3	4	5
110	My company makes supply chain decisions without the leader's authorization	1	2	3	4	5
111	Supply chain decision-making is distributed across many supply chain members	1	2	3	4	5
112	All supply chain members are rewarded for working together to meet customers' needs	1	2	3	4	5
113	Incentives for working with other firms are made available to my company	1	2	3	4	5
114	Performance evaluation is partly based on end-customer feedback	1	2	3	4	5
115	Rewards are based in part on integration of objectives across all supply chain member firms	1	2	3	4	5
116	My company is rewarded for how well we meet our own goals	1	2	3	4	5
117	My own company's performance determines our level of rewards	1	2	3	4	5
118	Rewards are passed out to the best performing firms in the supply chain	1	2	3	4	5
119	The supply chain leader determines the level of my company's rewards	1	2	3	4	5

**Thank you again for your valuable participation!**

## APPENDIX B

- B.1**            **Participant Survey**
  - Participant Demographics*
  - B.2**            **Participant Job Responsibility**
  - B.3**            **Participant Years of Supply Chain Experience**
  - B.4**            **Participant Company Supply Chain Position**
  - B.5**            **Participant Company Industry**
  - B.6**            **Participant Company Annual Revenue**
  
- B.7**            **Missing Data Summary**
  - Discriminant Validity*
  - B.8**            **Discriminant Validity (Transactional Group)**
  - B.9**            **Discriminant Validity (Transformational Group)**
  
  - Measurement Model*
  - B.10**          **Measurement Model (Transactional Group)**
  - B.11**          **Measurement Model (Transformational Group)**
  
  - Hypotheses Testing*
  - B.12**          **SCL Tests of Significance (H<sub>1</sub>)**
  - B.13**          **SCF Tests of Significance (H<sub>2</sub>)**



**INSTRUCTIONS:**

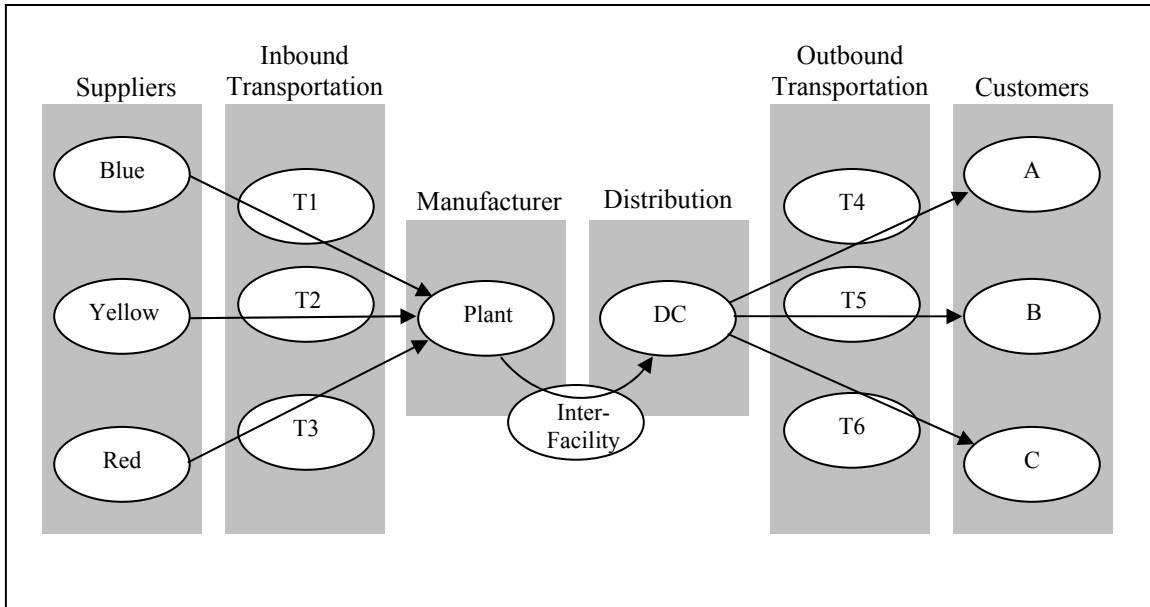
The following questions relate to your just-completed experience in the Supply Chain Value game. When answering the questions, please keep the following points in mind:

- You determine the **supply chain leader** based on your experience in the game.
- **My company** is the role you played in the game.
- **This supply chain** refers to all participants in the game just completed.
- **Supply chain members** are all companies represented in the supply chain.

Please try to answer each question. However, do not guess just to provide a response. If you cannot honestly answer a question please circle the question number.

**SECTION 1: Identify the supply chain leader**

1. Circle the company you consider to be the supply chain leader in the diagram below.
2. Mark an “X” through your own company.



3. Briefly describe ***why*** you selected the supply chain leader (optional):

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**SECTION 2: Characteristics of the supply chain leader**

Judge how frequently each statement fits the supply chain leader using the following rating scale.

Not at all	Once in a while	Sometimes	Fairly often	Frequently
1	2	3	4	5

***My supply chain leader...***

4	Is enthusiastic about what needs to be accomplished by the supply chain	1	2	3	4	5
5	Articulates a compelling vision of the supply chain's future	1	2	3	4	5
6	Expresses confidence that supply chain goals will be achieved	1	2	3	4	5
7	Specifies the importance of having a shared sense of purpose	1	2	3	4	5
8	Does not explain performance expectations	1	2	3	4	5
9	Clarifies the central purpose underlying actions of all supply chain members	1	2	3	4	5
10	Seeks differing perspectives from my company when solving problems	1	2	3	4	5
11	Gets my company to look at problems from many different angles	1	2	3	4	5
12	Encourages my company to express ideas and opinions	1	2	3	4	5
13	Asks my company to contribute ideas for improving supply chain problems	1	2	3	4	5
14	Promotes creativity from my company	1	2	3	4	5
15	Treats my company as distinct from other supply chain members	1	2	3	4	5
16	Considers my company as having different abilities than other supply chain members	1	2	3	4	5
17	Helps my company develop supply chain execution strengths	1	2	3	4	5
18	Provides useful advice to help my company improve	1	2	3	4	5
19	Understands my company's capabilities are different from others	1	2	3	4	5
20	Encourages my company to continually improve its supply chain skills	1	2	3	4	5
21	Provides my company with assistance in exchange for our efforts	1	2	3	4	5
22	Makes clear what my company should expect when performance goals are achieved	1	2	3	4	5
23	Ensures that my company receives appropriate rewards for achieving performance targets	1	2	3	4	5
24	Explains what my company must do to be rewarded for our efforts	1	2	3	4	5
25	Clearly communicates performance standards associated with my company's rewards	1	2	3	4	5
26	Focuses attention on my company's irregularities and mistakes	1	2	3	4	5
27	Concentrates full attention on dealing with my company's failures	1	2	3	4	5
28	Keeps track of all my company's mistakes	1	2	3	4	5
29	Directs my company's attention toward failures to meet standards	1	2	3	4	5
30	Focuses attention on my company's deviations from standards	1	2	3	4	5
31	Strives to uncover performance exceptions in my company	1	2	3	4	5

**SECTION 3: Characteristics of your role**

Judge how frequently each statement fits your company using the following rating scale.

Not at all <b>1</b>	Once in a while <b>2</b>	Sometimes <b>3</b>	Fairly often <b>4</b>	Frequently <b>5</b>
------------------------	-----------------------------	-----------------------	--------------------------	------------------------

***My company...***

32	Declines to follow the supply chain leader's directions when it is contrary to our own values	1	2	3	4	5
33	Asserts its views on important issues	1	2	3	4	5
34	Knows what to do to help the supply chain achieve its performance goals	1	2	3	4	5
35	Acts with integrity in all business dealings with the supply chain leader	1	2	3	4	5
36	Makes supply chain related decisions in line with our set of important values	1	2	3	4	5
37	Independently thinks up new ideas that contribute to supply chain goals	1	2	3	4	5
38	Tries to solve tough problems rather than look to the supply chain leader to do it	1	2	3	4	5
39	Looks for better ways to accomplish a supply chain task	1	2	3	4	5
40	Responds to supply chain problems with creative solutions	1	2	3	4	5
41	Champions the need for change in the supply chain	1	2	3	4	5
42	Actively participates in supply chain change projects	1	2	3	4	5
43	Builds a record of success in tasks important to the supply chain leader	1	2	3	4	5
44	Meets supply chain deadlines with the highest quality of work	1	2	3	4	5
45	Seeks out and completes assignments that go above and beyond what's required	1	2	3	4	5
46	Assesses its supply chain performance objectively	1	2	3	4	5
47	Makes sound decisions that benefit the entire supply chain	1	2	3	4	5
48	Completes our supply chain responsibilities accurately and on-time	1	2	3	4	5
49	Tries to off-load work from the supply chain leader	1	2	3	4	5
50	Works hard to support the supply chain leader's goals	1	2	3	4	5
51	Develops a network of relationships with other supply chain members	1	2	3	4	5
52	Tries to continually improve our relationship with the supply chain leader	1	2	3	4	5
53	Does not try to develop a deeper relationship with the supply chain leader	1	2	3	4	5
54	Strives to accomplish goals that have been mutually defined with the supply chain leader	1	2	3	4	5
55	Calls on other supply chain members who possess more knowledge when our skills are limited in a certain area	1	2	3	4	5
56	Demonstrates commitment to overall supply chain success	1	2	3	4	5
57	Gives our ideas freely to the supply chain leader	1	2	3	4	5
58	Enthusiastically supports the efforts of the supply chain leader	1	2	3	4	5
59	Contributes at a high level when not in a leadership position	1	2	3	4	5
60	Creates a shared purpose with the supply chain leader	1	2	3	4	5

**SECTION 4: Characteristics of the supply chain**

Judge how frequently each statement fits the entire supply chain using the following rating scale.

Not at all	Once in a while	Sometimes	Fairly often	Frequently
1	2	3	4	5

***In this supply chain...***

61	My company possesses the information needed to rapidly respond to customer requests	1	2	3	4	5
62	My company possesses the information needed to minimize customer complaints	1	2	3	4	5
63	My company possesses the information needed to handle unexpected events	1	2	3	4	5
64	My company possesses the information needed to effectively plan supply chain tasks	1	2	3	4	5
65	My company possesses the information needed to accurately fulfill customer orders	1	2	3	4	5
66	We coordinate our activities with the supply chain leader through formal communications channels	1	2	3	4	5
67	Formal requirements for communication are established by the supply chain leader	1	2	3	4	5
68	The supply chain leader communicates with my company on a predetermined schedule	1	2	3	4	5
69	My company must report status to the supply chain leader each period	1	2	3	4	5
70	The supply chain leader requires my company to comply with their reporting schedule	1	2	3	4	5
71	My company frequently discusses issues informally with the supply chain leader	1	2	3	4	5
72	Little action can be taken until the supply chain leader approves a decision	1	2	3	4	5
73	Even small matters must be referred to the supply chain leader before my company takes action	1	2	3	4	5
74	My company is constantly being monitored for rule violations by the supply chain leader	1	2	3	4	5
75	Supply chain decision-making is highly concentrated with the supply chain leader	1	2	3	4	5
76	My company has freedom to make decisions that may improve supply chain performance	1	2	3	4	5
77	All supply chain members are rewarded for working together to meet customers' needs	1	2	3	4	5
78	Incentives for working with other firms are made available to my company	1	2	3	4	5
79	Performance evaluation is partly based on end-customer feedback	1	2	3	4	5
80	Rewards are based in part on integration of objectives across all supply chain member firms	1	2	3	4	5
81	My company is compensated based on how well it meets our own goals	1	2	3	4	5
82	My company is compensated based on how well it meets overall supply chain goals	1	2	3	4	5
83	Other firms alter the facts to get what they want	1	2	3	4	5
84	Other firms exaggerate their needs to get what they want	1	2	3	4	5
85	Other firms breach agreements to their own benefit	1	2	3	4	5
86	Other firms are not always sincere	1	2	3	4	5

**SECTION 5: Information about the organization you actually work for (for classification purposes only)**

Answer these questions based on the company you work for and your actual experience.

87. Which term best describes the position the company you work for occupies in the supply chain?

- |  |   |                                       |
|--|---|---------------------------------------|
| <input type="checkbox"/> Raw material supplier | <input type="checkbox"/> Third-party provider   | <input type="checkbox"/> Wholesaler   |
| <input type="checkbox"/> Manufacturer          | <input type="checkbox"/> Retailer               | <input type="checkbox"/> End Consumer |
| <input type="checkbox"/> Distributor           | <input type="checkbox"/> Other (describe) _____ |                                       |

88. Which term best describes your company's industry?

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Automotive          | <input type="checkbox"/> Agribusiness/Food   | <input type="checkbox"/> CPG             |
| <input type="checkbox"/> Electronics         | <input type="checkbox"/> Medical/Rx          | <input type="checkbox"/> Construction    |
| <input type="checkbox"/> Aerospace           | <input type="checkbox"/> Apparel/Textiles    | <input type="checkbox"/> Transportation  |
| <input type="checkbox"/> Consumer Appliances | <input type="checkbox"/> Industrial Products | <input type="checkbox"/> Office Products |
| <input type="checkbox"/> Chemicals/Plastics  | <input type="checkbox"/> General Merchandise | <input type="checkbox"/> Other _____     |

89. Characterize the rate of change in your industry.

- Very Slow     Slow     Average     Fast     Very Fast

90. What is your Company's approximate annual sales revenue?

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Less than \$10 million | <input type="checkbox"/> \$500-\$999 million | <input type="checkbox"/> \$10-\$19.9 billion |
| <input type="checkbox"/> \$10-\$99 million      | <input type="checkbox"/> \$1-\$4.9 billion   | <input type="checkbox"/> GT \$20 billion     |
| <input type="checkbox"/> \$100-\$499 million    | <input type="checkbox"/> \$5-\$9.9 billion   |  |

91. Do you consider your firm to be a supply chain leader?

- No                       Yes

92. Briefly explain why you answered number 91 in that way?

\_\_\_\_\_

\_\_\_\_\_

93. What is your job title?

\_\_\_\_\_

94. How long have you been in this role?                      How long have you been with this company?

\_\_\_\_\_

95. How many *total* years of supply chain related experience have you accumulated in your career?

\_\_\_\_\_

**Thank you again for your valuable participation!**

### Appendix B.2: Participant Job Responsibility

	Frequency	%	Cumulative
Executive	34	13%	13%
Manager	110	43%	57%
Supervisor / Senior Staff	39	15%	72%
Staff / Analyst	62	25%	97%
Admin / Support Staff	8	3%	100%
Total	253	100%	

### Appendix B.3: Participant Years of Supply Chain Experience

	Frequency	%	Cumulative
1 year or less	46	18%	18%
2-5 years	61	24%	42%
6-10 years	61	24%	66%
11-15 years	32	13%	79%
16-20 years	31	12%	91%
More than 20 years	22	9%	100%
Total	253	100%	

### Appendix B.4: Participant Company Supply Chain Position

	Frequency	%	Cumulative
Raw Material Supplier	8	3%	3%
Manufacturer	10	4%	7%
Distributor	60	24%	31%
Third-Party Provider	11	4%	35%
Retailer	121	48%	83%
Wholesaler	4	2%	85%
End Consumer	13	5%	90%
Other	26	10%	100%
Total	253	100%	

"Other" includes transportation and freight delivery, supply chain consulting, real estate development, executive education, management training.

**Appendix B.5: Participant Company Industry**

	Frequency	%	Cumulative
Office Products	164	65%	65%
Transportation	34	13%	78%
Consumer Packaged Goods	10	4%	82%
General Merchandise	8	3%	85%
Electronics	7	3%	88%
Medical	4	2%	90%
Aerospace	2	1%	91%
Agribusiness/Food	2	1%	91%
Automotive	2	1%	92%
Construction/Home Repair	2	1%	93%
Other	18	7%	100%
<b>Total</b>	<b>253</b>	<b>100%</b>	

"Other includes apparel, chemicals, consulting, consumer applicances, industrial products, executive education.

**Appendix B.6: Participant Company Annual Revenue**

	Frequency	%	Cumulative
Less than \$10 million	18	7%	7%
\$10-\$99 million	6	2%	9%
\$100-\$499 million	13	5%	15%
\$500-\$999 million	5	2%	17%
\$1.0-\$4.9 billion	26	10%	27%
\$5.0-\$9.9 billion	153	60%	87%
\$10.0-\$19.9 billion	23	9%	96%
Greater than \$20.0 billion	9	4%	100%
<b>Total</b>	<b>253</b>	<b>100</b>	

**Appendix B.7: Missing Data Summary**

	Survey Count			Missing Item Count		
	Freq	%	Cumulative	Items	%	Cumulative
Fully completed surveys	330	66%	66%	-	0%	0%
Surveys missing 1-2 items	87	17%	83%	100	4%	4%
Surveys missing 3-4 items	17	3%	86%	64	2%	6%
Surveys missing 5-9 items	17	3%	90%	118	4%	10%
Surveys missing 10-20 items	22	4%	94%	305	11%	21%
Surveys missing 21+ items	29	6%	100%	2,241	79%	100%
Total	502	100%		2,828	100%	



**Appendix B.8: Discriminant Validity (Transactional Group)**

Constructs	SCL	SCF	INF	COM	REW	OPP
SCL	<b>0.69</b>					
SCF	0.28	<b>0.64</b>				
INF	0.21	0.22	<b>0.66</b>			
COM	0.48	0.38	0.46	<b>0.68</b>		
REW	0.36	0.40	0.35	0.62	<b>0.69</b>	
OPP	0.00	0.01	0.05	0.04	0.04	<b>0.71</b>

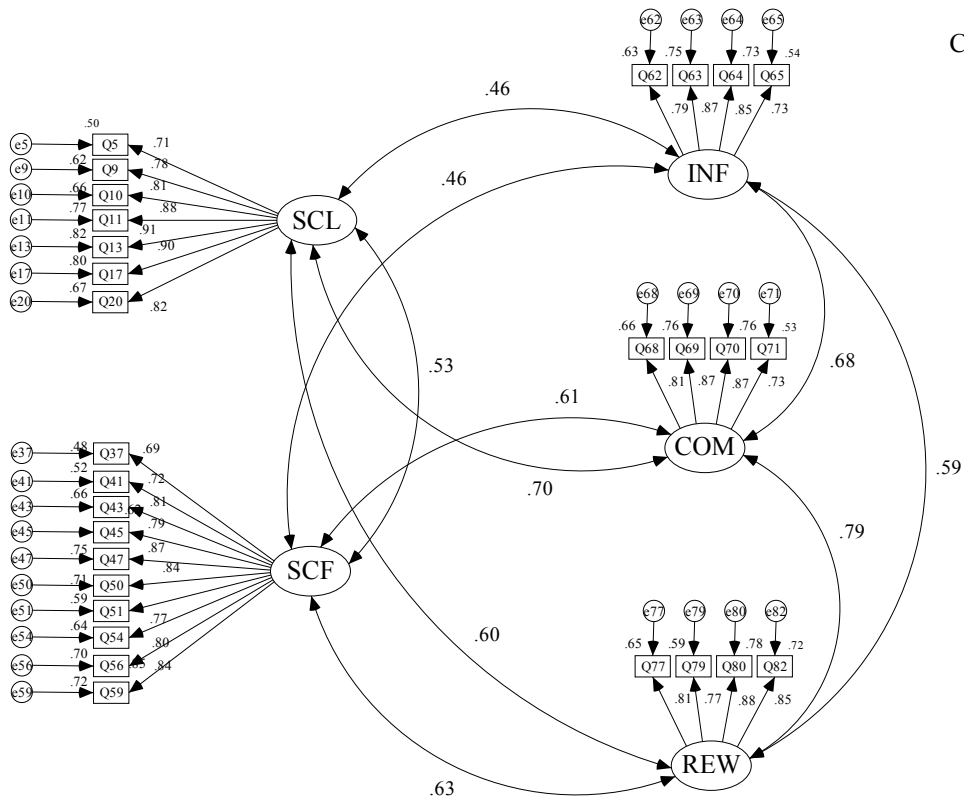
Note: Average Variance Extracted (AVE) represented by bolded diagonal values.  
Values below the diagonal are squared correlations.

**Appendix B.9: Discriminant Validity (Transformational Group)**

Constructs	SCL	SCF	INF	COM	REW	OPP
SCL	<b>0.61</b>					
SCF	0.47	<b>0.65</b>				
INF	0.24	0.47	<b>0.76</b>			
COM	0.37	0.32	0.29	<b>0.65</b>		
REW	0.40	0.47	0.47	0.53	<b>0.65</b>	
OPP	0.04	0.00	0.00	0.07	0.04	<b>0.81</b>

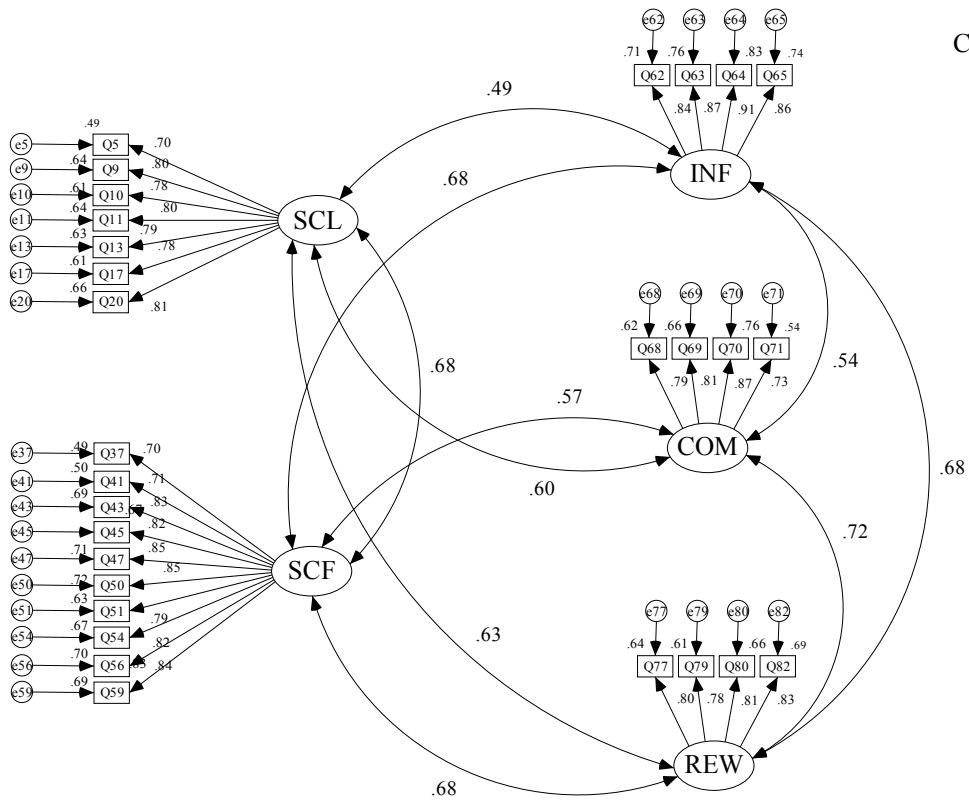
Note: Average Variance Extracted (AVE) represented by bolded diagonal values.  
Values below the diagonal are squared correlations.

## Appendix B.10: Measurement Model (Transactional Group)



Combined CFA  
 ChiSq = 1235.590  
 @ 758 df  
 RMSEA = .037  
 CFI = .956  
 TL = .952

## Appendix B.11: Measurement Model (Transformational Group)



Combined CFA  
 ChiSq = 1235.590  
 @ 758 df  
 RMSEA = .037  
 CFI = .956  
 TL = .952

**Appendix B.12: SCL Tests of Significance (H<sub>1</sub>)**

			Confidence Interval		t-value	p-value
	Mean	Std Dev	Upper	Lower		
Transactional group	2.23	1.08	2.09	2.36		
Transformational group	3.70	0.90	3.59	3.82		
Difference	1.47				16.072	≤ .000

**Appendix B.13: SCF Tests of Significance (H<sub>2</sub>)**

			Confidence Interval		t-value	p-value
	Mean	Std Dev	Upper	Lower		
Transactional group	2.79	1.10	2.65	2.93		
Transformational group	3.99	0.82	3.89	4.10		
Difference	1.20				13.461	≤ .000

## VITA

C. Clifford Defee holds Bachelor of Business Administration and Master of Business Administration degrees in Marketing from Texas A&M University. His primary research interests include the concepts of supply chain leadership and supply chain followership, inter-organizational capabilities, and supply chain strategy.

Cliff has been actively involved as assistant director of the Supply Chain Management and Strategy Forum at the University of Tennessee. He is a member of the Council of Supply Chain Management Professionals, the American Society of Transportation and Logistics, the Production and Operations Management Society, and the Strategic Management Society. Immediately prior to entering the doctoral program, Cliff was chief operating officer for PFSweb, Inc. Cliff previously served as vice president of operations for Daisytek International, following a 13-year career at Accenture.

In August 2007, Cliff completed the requirements for the Ph.D. in Business Administration with a major in Logistics and minor in Strategy at the University of Tennessee, Knoxville. He is presently employed as an Assistant Professor of Supply Chain Management at Auburn University in Auburn, Alabama.