

LEADERSHIP TRAITS AND THEIR IMPACT ON QUALITY SYSTEMS FOR THE
POWER SUPPLY INDUSTRY

by

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Abstract

The purpose of the study was to analyze perceived leadership traits and quality systems of manufacturing and service organization in the power supply industry. The study examines new supplier evaluation criteria that compares prospective suppliers' perceived leadership traits to their perceived quality systems in a self-assessment could improve the supplier selection process. This would reduce the cost of poor quality and would save valuable time and money during the supplier development process. The study builds from existing research using the Multifactor Leadership Questionnaire (MLQ) and modified Malcolm Baldrige National Quality Award Criteria MBNQA surveys. Pair wise correlation between leadership and quality subscales revealed consistent correlation for the power supply industry that was found in previous studies. However, ANOVA results comparing multiple dimensions associated with the subscales were not supported at the .05 significance level. The categorization of leadership as transformational or transactional proved too complex when applied to diverse suppliers from three culturally unique regions. Therefore, smaller high technology businesses running global supply chains can use this research to guard against prematurely disqualifying prospective suppliers based on one prominent leadership style over another when there is no data in this study to support such a decision. It also offers insight into the complexity of leadership and quality perceptions from different geographical regions.

Dedication

To my wife, Patty, you never wavered in your unconditional love, encouragement, and support. Without you, this journey would not have been possible.

To my children, Kyle, Alexandra “Alex”, and Evan who all paid a certain price for their father doing his research on weekends, late nights, and sometimes while on vacation.

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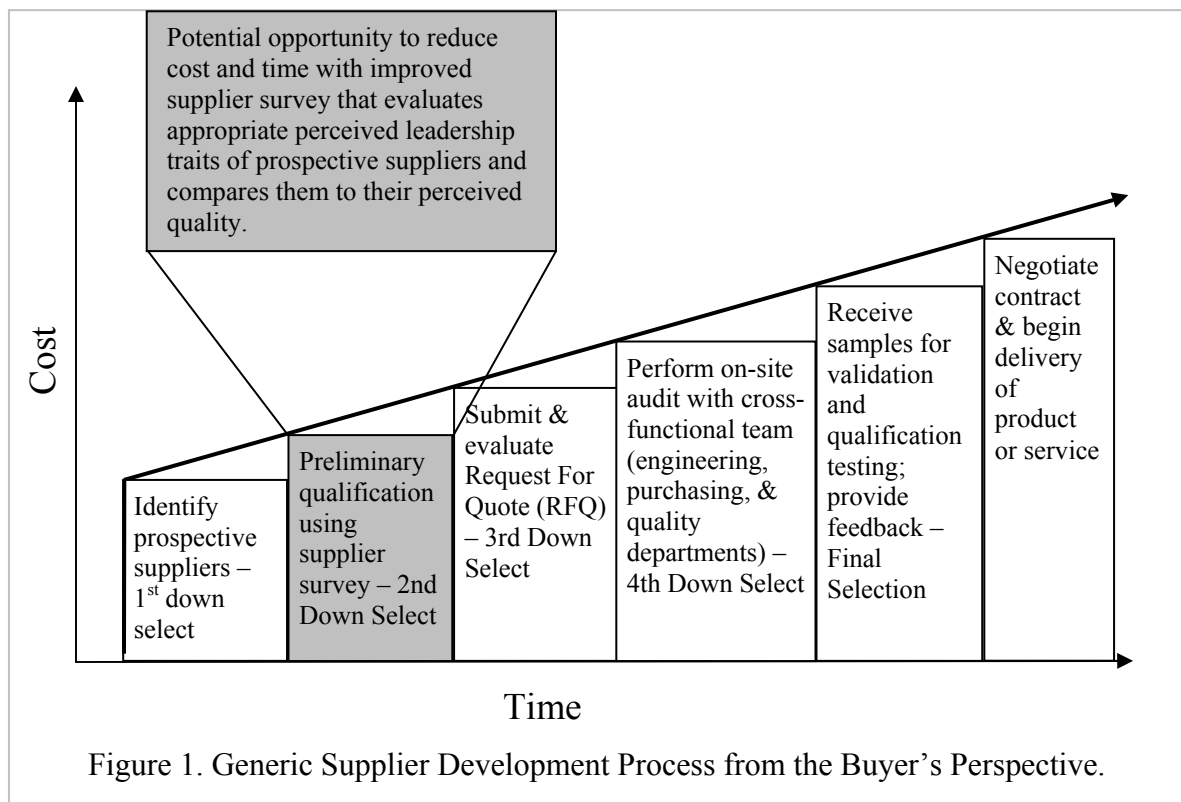
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CHAPTER 1. INTRODUCTION

The phenomenology between leadership traits and quality scores for suppliers are essential elements in supplier selection methodology. The supply chain is a strategic component of a company's competitive advantage (Saen, 2006). In order to achieve their business goals, companies must focus on supply chain and the supplier selection process (Barbarosoglu & Yazgac, 1997; Howard, 1998). Competition is no longer between two or more companies; rather, it's a competition between the company's supply chains (Mylnek, Vonderembse, Rao, & Bhatt, 2005). Supplier leadership contributes to overall supplier performance and is a key element in developing a culture capable of change (S. Gordon, 2005; Kidd, Richter, & Stumm, 2003). A method that compares prospective suppliers' perceived leadership traits to their perceived quality system constructs in a self-assessment survey could improve the supplier selection process.

The supply chain department finds the most qualified suppliers and integrates them into the company's supply chain; traditionally their focus has been on unit price not relationship building (Tan & Tracey, 2001). The supply chain includes all business activities needed to design, make, deliver, and use products and services (Hugos, 2003). Companies often rate their suppliers' performance on quality, delivery, flexibility, and technical contributions (Blackstone, Fogarty, & Hoffmann, 1991; Hines, 2004; Deringer, Niezen, & Weller, 2007). The challenge to the supply chain departments is choosing the supplier that best meets their business needs. This effort requires a cross-functional commodity team made up of company experts from engineering, production, and purchasing departments (Burt & Dobler, 1995; Weiss, 1998).

The cross-functional team usually breaks their work into phases before a final decision is made. Each phase includes one or more of the following elements: research and planning, surveys, site visits, referral reviews, financial checkups, inspection, qualification of samples, supplier selection, and negotiation of contracts (Burt & Dobler, 1995; Duarte, Evans, & Sackett, 2004; Monczka & Trent, 1999). As the procurement cycle progresses through each phase, participation of the team increases, see Figure 1. This increases the cost to both the company and prospective supplier (Saen, 2006).



Companies use various strategies to differentiate good prospective suppliers from bad ones. Most companies employ a supplier self-assessment survey to save time and money in early phases of the procurement process (Weiss, 1998). There are numerous assessment elements, but they usually focus on criteria mentioned earlier: cost, quality, delivery, and capacity (Dahel, Nasr-Eddine, 2003; Haq & Kannan, 2006). The supplier assessment survey can provide valuable information, but is regularly used to define minimum requirements that vary in complexity from company to company (Weiss, 1998).

This study analyzes perceived leadership traits and quality systems of manufacturing and service organizations in the power supply industry. It builds from previous work conducted by Hirtz (2002) and Hirtz, Murray, and Riordan (2007) on non academic administrative and service departments at the University of Missouri-Rolla. Hirtz (2002) and Hirtz et al. (2007) used a quality survey developed by Wu (1996), and leadership questionnaire developed by Bass (1985) to examine specific perceived quality systems and leadership styles respectively. Wu's quality survey is based on the Malcolm Baldrige National Quality Award (MBNQA) criteria and Missouri Quality Award (MQA) to assess organizational quality systems related to leadership, information analysis, strategic planning, human resources, process management, and customer focus. Wu (1996) concluded in her research that the MBNQA and MQA questionnaire of 136 questions could be reduced down to 34 questions and effectively measure quality programs. Bass' (1985) original work on the MLQ leadership survey assessed transformational, transactional, and non-transactional leadership traits. Hundreds of research studies on leadership have used the MLQ (Bass, 1997). This research will

examine the supplier selection process; focusing on supplier perception of leadership styles and quality systems. The leadership styles examined will include: transformational, laissez-faire, transactional, servant, and situational leadership, which can provide valuable insight into the level of quality management, performance, and capability shown in Figure 2.

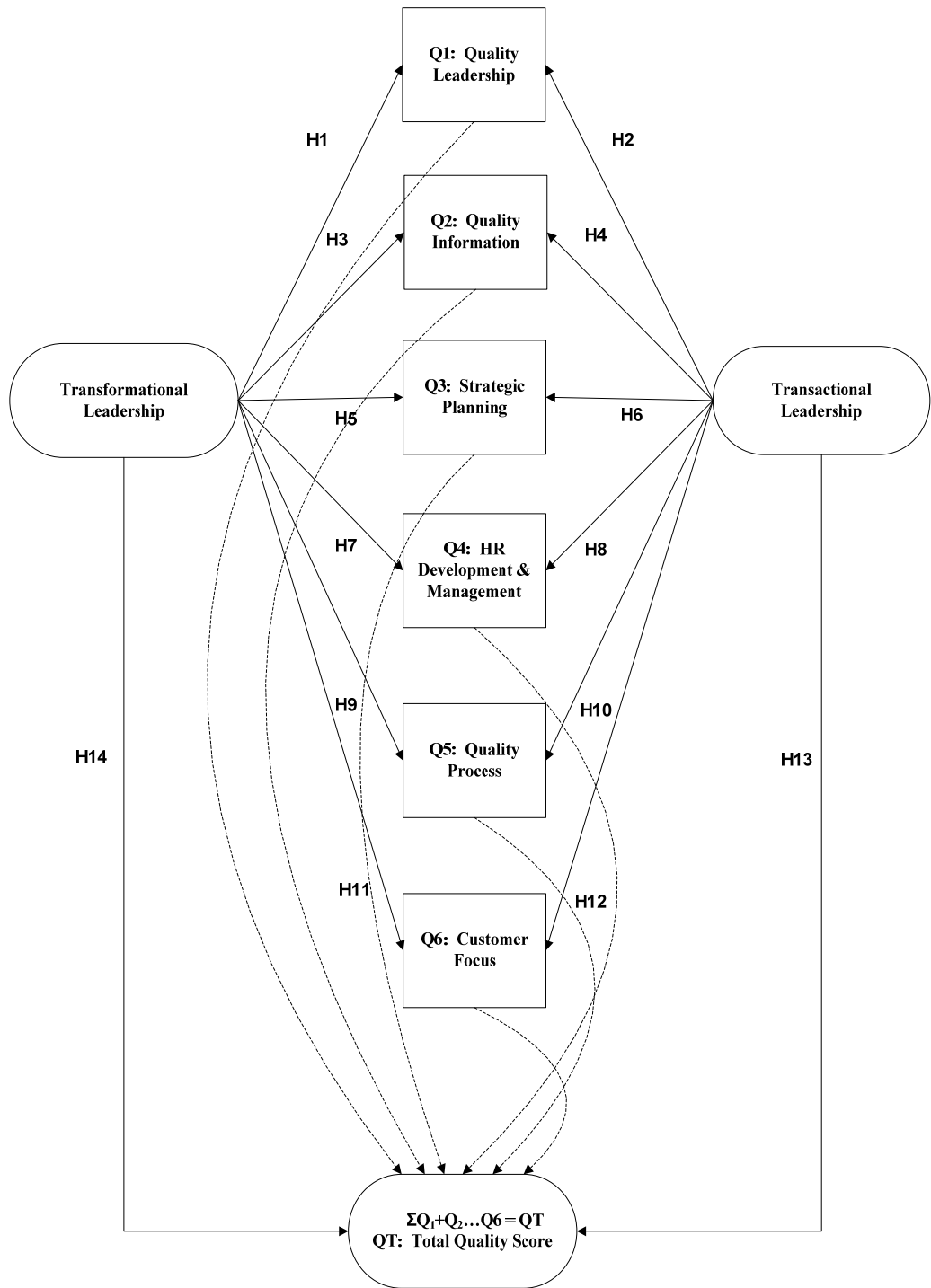


Figure 2, Proposed Theoretical Supplier Leadership and Quality Model. Sub Criteria, Q1-Q6, Shown for Total Quality Score.

This research will offer insight into how suppliers leverage their leadership traits to take full advantage of their quality systems to provide their customers a defect free product or service. In addition to building from existing research, this work would increase the body of knowledge in the fields of supply chain, leadership, and quality management for the power supply industry. It also has practical application during the supplier selection process by more accurately identifying organizations with high performing quality systems.

Introduction to the Problem

Purchasing managers need high confidence in their suppliers' ability to provide quality products and services to reduce the risk to their organization (Lee, 2004). There is a continuum of supplier management that spans from infrequent interaction to detailed supplier qualification (Ellram & Krause, 1997). Supplier qualification can include the use of self-assessment surveys that attempt to evaluate the suppliers' organization. These surveys require less effort by the company's buyer reviewing the suppliers' organization and all quality functions (Guzzetta, 1993). If the survey doesn't measure specific traits, then the sourcing effort can result in a poor sourcing decision (Haq & Kannan, 2006). New evaluation criteria's are needed to assess prospective suppliers. Saen (2006) contended that supplier evaluation criteria cannot rely only on quantitative selection process, but should also include qualitative elements. Haq and Kannan (2006) asserted that manufacturer's "needs" may be qualitative; however, the assessment criteria must be quantifiable for evaluation purposes.

Purchasing managers must manage their supply chain to deliver simultaneous improvements in customer service and their internal operations (Hugos, 2003). Hugos

(2003) asserted that this is complicated by the suppliers' natural tendency to provide their product or service at the lowest cost to themselves. Poor supplier quality consumes an organization's working capital with higher inventory and reduced customer service (Dereshin & Juran, 2000; Lo & Yeung, 2006). A method that compares prospective suppliers' perceived leadership traits to their perceived quality system in a self-assessment survey could improve the supplier selection process. This would reduce the cost of poor quality and would save valuable time and money during the supplier development process.

Background of the Study

Influential work in quality systems, leadership styles, quality and leadership linkages, and supplier evaluation methods provide a foundation for this study. Leadership styles examined in this research include: transformational, transactional, laissez-faire, servant, and situational. Leadership styles can be defined and specific traits categorized, but there is no complete theory of leadership (Yukl, 1989). Recent developments in leadership research have yielded an effective survey method using the Multifactor Leadership Questionnaire (MLQ) developed by Bass and later modified by Avolio and Bass to analyze transactional, transformational, and non-transactional or laissez-faire leadership traits (Bass & Avolio, 1993 & 2004). Bass (1985) contended that leadership types are good comparables for effective quality systems. Avolio and Bass (1999) refined the original MLQ in their research and concluded that transformational leadership traits could be observed and establishes a foundation for higher levels of performance.

Leaders' role in product quality was recognized by pioneers in the quality industry, though a specific type or style of leadership had not been defined. Deming,

Crosby, and Juran identified leadership as key components in an organization's quality system (Hunt, 1992). While generalizations exist on effective leadership and quality management, this had not extended to specific industries like power supply manufacturers. According to Hirtz et al. (2007) nine of Deming's Fourteen Points of quality deal directly with leadership. Deming (1994) called for institution of leadership that drives out individual fear, promotes worker development and education, and breaks down barriers by improving communication. Crosby referenced leadership with his Fourteen-Step Quality Improvement Program, which stressed management commitment. Juran's key elements of quality in his Quality Trilogy stressed planning, improvement, and control. Wortman (2001) contended that Juran's system of quality requires management to train and empower its employees, an indirect reference to leadership traits and culture. Benson, Saraph, and Schroeder (1989) had similar views to Deming and Juran and singled out leadership traits as a success factor for organizations. Jemangin, Kit, Lee, and Quazi (1998) affirmed leadership traits in quality performance in manufacturing and service companies.

Leaders use various strategies to improve quality. These methods closely resemble transformational leadership and include: analysis of needs, developed vision, focus on the present, high sense of urgency, strong leadership, internal support, action plan, empowered organization, effective communication, and disciplined follow-up (Jick & Peiperl, 2003). In contrast to this approach is the Box Approach described by Farkas and Wetlaufer (1996) where leaders use transactional leadership styles to enforce strict compliance of established processes and procedures. Blanchard, Hersey, and Natemeyer (1979) contend that both have their place in an organization, but don't adequately

describe more contemporary leadership traits described by Avolio, Bass, and Jung (1999).

Leadership and quality systems have strong established linkages. Deming (1994) asserted that “Quality comes from the top,” in reference to a leader’s ability to influence their company’s quality (p.3). A key leadership trait is the ability to change as needed to make improvements and improve quality (Gull, 1994). Juran and Deming stressed the importance of leadership and management behavior (Wortman, 2001). Both of these references to leadership and management styles emphasized change, culture, and continuous improvement as key elements to high levels of perceived quality Hirtz (2002) and (Hirtz et al., 2007).

Finally, the linkages between leadership, quality, and their application to the supply chain are less established. The literature on supply chain strategies itself offers little information on specific leadership traits and their correlation to their perceived quality systems. This is further complicated in earlier quality literature that loosely characterized management and leadership capabilities and often used the two terms interchangeably. Broad references to visionary leadership from senior management in the supply chain are one dimension of leadership (Vokurka & Lummus, 2003). While Total Quality Management (TQM) systems has leadership as a top “enabler,” its relationship to supply chain management is from the buyer’s perspective, not the suppliers’ perceived prospective (Gotzamani, Theodorakioglou, & Tsiolvas, 2006). These distinctions are more relevant as companies view the supply chain as a competitive advantage (Chi & Hwang, 2005; Porter, 1996; Tan & Tracey, 2001). The focus for many organizations is optimizing what exists and not rebuilding the supply chain from the ground up, one

supplier at a time. A study that focuses on external relationships between company and their suppliers is the next step in supply chain research (Friis, Grant, & Kotzab, 2006).

Statement of the Problem

This research will examine supplier leadership traits and their relationship to individual quality elements that make up a total quality score. Companies wanting to identify the right supplier in the early stages of the supplier qualification process can use this research to help them make better sourcing decisions.

Companies risk delays in qualifying new suppliers and unnecessary costs and lost time if a supplier is approved with poor quality systems. There is little research of the linkages between perceived leadership traits and perceived quality system performance in supply chains. Procurement personnel lack the tools and knowledge in assessing and integrating leadership traits and quality systems together to assist them in making a supplier selection decision.

Previous research by Hirtz (2002) and Hirtz et al. (2007) compared perceived leadership traits with perceived quality, but its application was not expanded to the supply chain or the supplier selection process. There are two reasons for this: First, assessment of leadership in the context of quality and supply chain is loosely defined and taken from the buyer's perspective (Gotzamani et al., 2006). Second, parsimonious treatment of supplier quality does not consider multilevel constructs; purchasing departments are graded on quality, cost, and delivery (Burt, & Dobler, 1995). Integrating leadership traits into a supplier self-assessment could provide further insight into quality systems at the earliest stages of the supplier development process. This research could

improve the supplier development process by reducing cost and time with an improved supplier self-assessment survey that includes questions on leadership traits.

Purpose of the Study

This research will examine supplier leadership traits and their relationship to individual quality element that make up a total quality score. Companies wanting to identify the right supplier in the early stages of the supplier qualification process can use this research to help them make better sourcing decisions. Dahel (2003) and Deringer et al. (2007) asserted that companies' main focus are as follows: item costs, product quality, delivery performance, and supply capacity. Howard (1998) contended that traditional objective criteria of price, quality, and delivery are valid, but additional criteria that focus on leadership or management strength should be examined as well. B. Chen and Yang (2006) asserted that both quantitative and qualitative criteria should be considered in the supplier selection process. They contended qualitative criteria that include elements of management and quality should be part of the supplier evaluation process (B. Chen & Yang, 2006). Leadership or sometimes referred to as management is acknowledged as critical for strong quality systems (Deming, 1994; Wu, 1996; Savolainen, 2000; Buch, & Rivers, 2001; Hirtz, 2002; Gharneh, Lai, & Soltani, 2005; G. Calhoun, Griffith, & Sinioris, 2007; Hirtz et al., 2007). Perceived supplier leadership traits and their perceived quality has never been gathered and analyzed for the power supply industry. This industry services "high-mix, low-volume" and "low-mix, high-volume" business sectors with the former significantly more difficult to manage.

Chin, Pun, and Yeung (2006) asserted using a self-assessment to analyze suppliers can contribute to lowering supplier management costs. A supplier self-

assessment could probe for specific leadership attributes to identify suitable suppliers in the earliest phases of the supplier selection process (i.e. before site visits, qualification testing, negotiated terms and conditions, and product delivery). An improved supplier selection process assesses supplier performance, establishes a reliable supply chain, and provides suppliers with feedback (Chin et al., 2006).

Eng (2005) contended that further research is needed to examine the leadership and organizational structures of suppliers' quality systems. Jemangin et al. (1998) contended that management leadership is a critical factor in measuring organization's quality management. They suggest that further research using the Baldrige criteria as a self-assessment could prioritize quality improvement efforts.

Hirtz (2002) and Hirtz et al. (2007) evaluated nonacademic administrative department's leadership styles and quality management using both Avolio and Bass' leadership questionnaire and Wu's quality survey. Their research assessed transformational, transactional, and non-transactional leadership traits and compared them to a quality score and quality elements made up of leadership, information and analysis, strategic planning, human resources development and management, process management, and customer focus. This research has not been extended to the power supply industry.

Rationale

Current theories in leadership research can be applied to the suppliers in the power supply industry. The a priori notion that leadership enables quality is well documented (Hunt, 1992; Wortman, 1997; Gee, Richardson & Wortman, 2000; Wu, 1996). Benson et al. (1989) contended that there has been little progress toward

prioritizing quality elements that include management's leadership with other quality criteria. Leaders that thrive in a changing business environment are already characterized (Schrujjer & Vansina, 1999). Leadership, teamwork, management control, and their relationship to supplier quality have been studied and provide a framework for this research; but specific research that studies leadership traits and their impact on specific quality elements that include change have not been performed (Liao & Wu, 2006). Further, a study that compares the responses from a leadership survey and compares them against an organization's perceived quality system that assess multiple quality dimensions as well as a total quality score has not been performed for the power supply industry.

Research Questions

The examination of transformational and transactional leadership traits and quality element constructs that create a quality score require multiple hypothesis questions. The quality elements examined include: leadership, information and analysis, strategic planning, human resources development and management, process management, and customer focus. Together these elements construct a total quality score.

Does suppliers' perceived transformational or transactional leadership traits result in higher scores for each perceived quality construct? What leadership traits yield a higher total quality score? Transformational and transactional leadership are expected to reveal notable differences in the variations in the quality elements that culminate into a total quality score. The following hypotheses are proposed:

H1 (null): There is no relationship between a suppliers' transformational leadership style and their perceived "quality leadership" score.

H1 (alternative): There is a positive relationship between a suppliers' transformational leadership style and their perceived "quality leadership" score.

H2 (null): There is no relationship between a suppliers' transactional leadership style and their perceived "quality leadership" score.

H2 (alternative): There is a negative relationship between a suppliers' transactional leadership style and their perceived "quality leadership" score.

Supplier quality is characterized by suppliers' use of quality systems that include Total Quality Management (Lo, Sculli, & Yeung, 2004). Hirtz (2002) and Hirtz et al. (2007) asserted there is a positive relationship between transformational leadership and total quality scores. Buch and Rivers (2001) contended that followers perceived their organization's commitment to quality management when they perceived leadership support. This study will consider the following hypotheses:

H3 (null): There is no relationship between transformational leadership and their perceived "quality information and analysis" score.

H3 (alternative): There is a positive relationship between transformational leadership and their perceived "quality information and analysis" score.

H4 (null): There is no relationship between transactional leadership and their perceived "quality information and analysis" score.

H4 (alternative): There is a negative relationship between transactional leadership and their perceived "quality information and analysis" score.

H5 (null): There is no relationship between suppliers' transformational leadership style and their perceived "quality strategic planning" score.

H5 (alternative): There is a positive relationship between suppliers' transformational leadership style and their perceived "quality strategic planning" score.

H6 (null): There is no relationship between suppliers' transactional leadership style and their perceived "quality strategic planning" score.

H6 (alternative): There is a negative relationship between suppliers' transactional leadership style and their perceived "quality strategic planning" score.

H7 (null): There is no relationship between suppliers' transformational leadership style and their perceived "quality human resources development and management" score.

H7 (alternative): There is a positive relationship between suppliers' transformational leadership style and their perceived "quality human resources development and management" score.

H8 (null): There is no relationship between suppliers' transactional leadership style and their perceived quality "human resources development and management" score.

H8 (alternative): There is a negative relationship between suppliers' transactional leadership style and their perceived quality "human resources development and management" score.

Effective leadership from suppliers is needed to ensure their organization's culture is capable and responsive to change. Lo and Yeung (2006) contended that culture and quality systems are key elements in a suppliers' effectiveness. A culture of continuous process improvement contributes to supplier performance. The final proposed hypotheses:

H9 (null): There is no relationship between suppliers' transformational leadership style and their perceived "quality process management" score.

H9 (alternative): There is a positive no relationship between suppliers' transformational leadership style and their perceived "quality process management" score.

H10 (null): There is no relationship between suppliers' transactional leadership style and their perceived "quality process management" score.

H10 (alternative): There is a negative no relationship between suppliers' transactional leadership style and their perceived "quality process management" score.

H11 (null): There is no relationship between suppliers' transformational leadership style and their perceived "quality customer focus" score.

H11 (alternative): There is a positive between suppliers' transformational leadership style and their perceived "quality customer focus" score.

H12 (null): There is no relationship between suppliers' transactional leadership style and their perceived "quality customer focus" score.

H12 (alternative): There is a negative no relationship between suppliers' transactional leadership style and their perceived "quality customer focus" score.

H13 (null): There is no relationship between suppliers' transformational leadership style and their perceived "total quality" score.

H13 (alternative): There is a positive relationship between suppliers' transformational leadership style and their perceived "total quality" score.

H14 (null): There is no relationship between suppliers' transactional leadership style and their perceived "total quality" score.

H14 (alternative): There is a negative relationship between suppliers' transactional leadership style and their perceived "total quality" score.

This research asks what leadership traits result in the highest quality score. The continuum of leadership and multidimensional elements contributing to a total quality score create the need for multiple hypotheses questions. These null hypotheses would reveal dissimilarities between the suppliers' transformational and transactional leadership traits and their quality score.

Significance of the Study

Mitigating supply chain risk provides companies better market penetration, increased sales, and speed to market (Lee, 2004). The complexity of supplier selection often limit procurement personnel to quantitative evaluation criteria such as cost, quality and delivery; however, B. Chen and Yang (2006) asserted that both qualitative and quantitative criteria are needed in the supplier evaluation process. Current strategies exclude leadership traits in a supplier self-assessment (Monczka & Trent, 1999; Haq & Kannan, 2006). This research will provide insight into prospective supplier quality systems by assessing leadership traits in a supplier self-assessment. Procurement departments can lower their supplier selection costs with a self-assessment that more accurately assesses quality systems by analyzing leadership traits. This research has application at the earliest stages of the supplier selection process when costs and procurement cycle time are lowest.

Suppliers also benefit by receiving feedback. They would have actionable information that could improve their performance. Examining critical factors in quality and synthesizing these factors with leadership traits will help suppliers know where they should make improvements and apply critical resources (Jemangin et al., 1998).

Definition of Terms

1. High-Mix, Low-Volume: An industry descriptor of manufacturing practices of building a large variety of products, but in low quantities. According to Lane (2008) high mix low volume companies have thousands of components to manage with high variability from order to order.
2. ISO 9001: According to S. Chen, Ebrahimpour, and Han, (2007) ISO International Organization of Standardization (ISO) is an organization derived criteria for a quality management system that is split into categories that cover quality processes, measurements, and documentation requirements.
3. Leadership: Kotterman (2006) asserted leaders are risk takers and tend to inspire their followers with emotion and vision using effective communication skills. However, Kotterman asserted that confusion and debate between leadership and management exists in both academic and the workplace. The taxonomy of leadership in the workplace provides a framework for comparisons to management and is listed in Table 1.

Table 1
Comparison of Management and Leadership

Process	Management	Leadership
Strategic Planning	Creates processes and project plans	Create strategy and sets priorities
Organizational Development	Establishes organizational structure	Communicates vision, mission, and direction
	Low energy, hands-off oversight	Displays driven, high emotion
	Low passion, inhibits employee options	High energy, revitalizes organization
Strategic Implementation	Controls processes	Empowers employees and encourages risks
	Identifies problems	Builds employee capabilities and satisfies development needs
	Takes low risks to problem solving	
Vision Outcome	Administer of strategy and manages results	Sets a sense of urgency and creates environment for change

4. Low-Mix, High-Volume: An industry descriptor of manufacturing practices of building a low variety of products, but in high quantities (Lane, 2008).
5. Malcolm Baldrige National Quality Award (MBNQA): Quality system built on 7 core values that include: 1) Leadership, 2) Strategic planning, 3) Customer and market focus, 4) Measurement, analysis, and knowledge management, 5) Human resource focus, 6) Process management, and 7) Business results (C. Lam, K. Lam, & Wang, 2008).

6. Management: Kotterman (2006) asserted that managers minimize risks and execute their leaders' vision. They manage and control processes in a systematic and consistent manner.
7. Missouri Quality Award (MQA): Regional quality award modeled after the MBNQA and administered by the state of Missouri for companies residing in Missouri, Wu (1996).
8. MLQ (Multifactor Leadership Questionnaire): Survey created by Bass and Avolio to measure a range of leadership traits (Avolio & Bass, 1993).
9. SCM (Supply Chain Management): A network of companies that work together to supply goods and services to their customers (Hugos, 2003).
10. TQM (Total Quality Management): Is a quality management approach that focuses on processes to reduce costs and improve customer satisfaction (J. Cheng, 2007).

Assumptions and Limitations

Epistemological connection between leadership and quality cannot be empirically observed in this study. This research cannot directly measure effectiveness of the quality systems by site visit or analysis of products or services. As a point of practicality capturing and validating actual quality data from each respondent is outside the scope of this study.

The ontological foundation of the quality survey in this research is not a meronym of the Malcolm Baldrige Quality Award, but rather an equivalent replacement. The quality survey is a derivation of the MBNQA which has enjoyed the same widespread success as the MLQ (Walsh, Wilson, & Needy, 2003). This research reduces the

MBNQA and the MQA criteria award from 136 questions to 34 questions and assumes that the survey accurately assess perceived quality system performance.

This research is examining perceived leadership styles and perceived quality systems. There is an a priori postulation that leadership traits exist at some measurable level in every organization implementing a quality system (Gonzalez & Guillen, 2001). Multiple surveys will be sent out in attempts to address bias within each organization. Correlating leadership and quality variables from the same source could create single source bias (McGoldrick, Stewart, & Watson, 2001). There are several limitations associated with single source bias. The respondents could view their relationship with their leader differently than others in the organization. Negative bias toward recent events as well as the respondents understanding of leadership can influence their responses (Bass & Stogdill, 1990; Yukl, 1989). Respondents bias from cognitive dissonance when predetermined beliefs that leadership and quality are covariate, but respondents experience different performance outcomes. For example, respondents may view their leaders as effective, but experience poor business performance from ineffective quality systems.

Nature of the Study

This research is a quantitative study. There are noted advantages using quantitative over a qualitative approach for this research. For the purposes of this study an objectivists approach was chosen that builds from existing research in leadership and quality systems. The quantitative method focuses on objective testing of hypothesis, verifies theories, and measures variables to obtain data for an analysis (Creswell, 1998a).

This method has several notable short comings with respect to understanding the contextual complexity of respondent's answers, bias, and validity.

Eldabi, Irani, Paul, and Love (2002) contended that researchers should consider several disadvantages to quantitative study which include: does not recognize variability in human behavior, stresses verification over discovery, closed data collection, and inability of researchers to observe something without changing it. Eldabi et al., (2002) also contended that a weakness of quantitative research is that it is unable to take into account the differences between people and the objects of natural science. Yukl (1989) cited several disadvantages that could lead to validity concerns when biases from questionnaire interpretation, observational, or poor business performance can have on respondents. Luthans and Morey (1984) raised concern that objectivist or quantitative methodology fails to consider the complexity of observed behavior. This is evident when written or verbal responses differ from actual observed behavior; however, Morey and Luthans (1984) suggested an ethnographic technique applied to an organization is not practical for most researchers.

With these short comings, quantitative methodology for this research has real practical advantages. The MLQ and the MBNQA criteria have accurately assessed leadership traits and quality systems respectively (Calhoun, 2001; A. Gordon et al., 2002; Evan & Jack, 2003; Cameron & Winn, 1998). Quantitative approach assumes that predefined variables have the same meanings across multiple settings (Bartunek & Myeong-Gu, 2002). Questionnaires are established methods to evaluate leadership traits and quality systems (Wu, 1996; Avolio et al. 1999). The surveys will allow the

respondents the opportunity to clarify their answers and this could justify a mixed method approach, but that is not the intent of this research.

Organization of the Remainder of the Study

Chapter two addresses quality systems, linkages between quality and leadership, and supplier selection methods. The third chapter will describe the research design and methodology. It will examine how the information will be gathered and the ethical considerations for collecting data from suppliers in power supply industry. In chapter four a brief summary of the research design and methodology followed by the research hypothesis, and a discussion of the findings. Chapter five will summarize the research findings, implications, and recommendations for future research.

CHAPTER 2. LITERATURE REVIEW

Introduction

This literature review will examine leadership styles and its influence on perceived organizational quality. Quality systems are reviewed to develop a context for comparison of the suppliers' implementation of one or more of these quality constructs. This research will then review the supplier selection process and their use of leadership traits and quality constructs focusing on the predominant selection methodologies.

The quality systems that are reviewed include: Total Quality Management (TQM), Business Process Reengineering (BPR), ISO 9000, and Malcolm Baldrige National Quality Award (MBNQA) criteria. Leadership styles and their theoretical relationship to these quality systems will provide a framework for this research. The leadership styles discussed include: Transactional, Laissez-faire, Transformational, Servant and Situational. Supplier selection criteria and methods that include: weighted point, ranking or criteria, cost based, Analytical Hierarchy Process (AHP), and Analytical Network Process (ANP). This research then connects the theoretical supplier leadership model to their associated quality constructs.

Total Quality Management (TQM)

According to Wortman (1997), "TQM is a management approach of an organization, centered on quality with a global strategy, based on profitability through customer satisfaction, including benefits to the members of the organization and to society" (p. II-29). Tobin (1990) contended that TQM is a customer focused, process

oriented, quality first culture. D. Gordon (2002) asserted that TQM is a leadership driven quality strategy that balances customer needs with business results.

Longitudinal research of multiple industrial sites supported theoretical linkages between employee's perception of quality and of organizational leadership support for sustained quality improvement (Buch & Rivers, 2001). In this research Buch and Rivers (2001) proposed the following:

H1: High level of leadership commitment and support for the TQM initiatives are predicted

H2: Employees who perceive leadership as more committed and supportive will also perceive TQM values as more integrated into the organization's culture

H3: The TQM initiatives will bring about a constructive culture characterized by empowerment

H4: The TQM initiative will positively impact performance measures and employee satisfaction (p.366).

Their research revealed high correlation for leadership and perceived quality, with Pearson coefficient of 0.86 and 0.88 respectively. Buch and Rivers (2001) asserted that a high correlation analysis, $r = 0.67$ supported their hypothesis that strong leadership is needed to successfully integrate total quality into an organization.

Most TQM programs fail due to inappropriate leadership (Krumwiede & Lavelle, 2000; Lemak, Mero, & Reed, 2002). Taylor and Wright (2003) considered the effect leadership involvement in quality systems of a cohort of 113 organizations with TQM programs in manufacturing and consumer sectors. Their objective was to conduct a longitudinal study that explores perceived success with TQM and the reasons for

discontinuance over a five year period. They performed Chi-square statistics to test for perceived TQM success and nine hypothesized independent variables. Taylor and Wright (2003) concluded that effective leadership was critical for sustained quality results. Taylor and Wright (2003) did not characterize the type of leadership styles most successful, but noted that 42 of the 113 cohorts examined dropped their quality programs and concluded that a lack of involvement from the senior leaders contributed to its failure. Lemak et al. (2002) contended that transformational leadership is a critical trait for successful implementation of TQM. W. Edwards Deming, a proponent of Total Quality Management proposed that quality for the customer should be the driving force behind management decisions. His fourteen “principles of obligations” that are outlined by Gee et al., (2000) listed below:

1. Create constancy of purpose for improvement .
2. Adopt a new philosophy; we are in a new economic age.
3. Cease dependence upon inspection as a way to achieve quality.
4. End the practice of awarding business based on price tag.
5. Constantly improve the process.
6. Institute training on the job.
7. Institute improved supervision (leadership).
8. Drive out fear.
9. Break down barriers between departments.
10. Eliminate slogans and unrealistic targets.
11. Eliminate numerical quotas.
12. Remove barriers from workers.

13. Institute programs for education and retraining.

14. Emphasize to the company to work towards the transformation. (p 79).

These principles are meant for leaders to improve organizational performance and elevate workforce morale (Deming 1982). Effective leaders implement these principles and improve their quality systems (Calnan & Hirzel, 2004).

In contrast, E. Cheng, Lai, and Yeung (2006) reviewed 225 Asian electronic manufacturing firms with both TQM and non-TQM systems, using self-assessment questionnaire and concluded that there were no significant differences between the two groups. They measured several constructs including management's leadership, but conceded that further research is needed with possible focus on western companies. Methodological flaws exist in the form of bias from a self-assessment and are inevitable when filled out by individuals and that cross-sectional surveys provide limited longitudinal evidence (E. Cheng et al., 2006). E. Cheng et al. (2006) contended that site visits to suppliers can help to reduce bias. Scheuermann and Zhu (1999) contended that TQM is too dependent on an organization's leadership, making it less influential to organization's success. In comparison to leadership styles used to implement TQM, is a process based quality system called Business Process Reengineering (BPR).

Business Process Reengineering (BPR)

BPR is a radical quality management approach that redesigns and creates new processes quickly (Hammer, 1990). Broaden (1996) contended that BPR contains similar elements to TQM that include processes improvement and strategic planning. BPR focuses on improving quality and creating customer value. They both also require visionary leadership similar to transformational leadership to achieve process changes

that improves quality (Broaden, 1996). Using BPR to compare and contrast with TQM provides better understanding of TQM principles. BPR and TQM exist on separate ends of the quality continuum, see Table 2 (Aspinwall & Jarrar, 1999; Hammer, 1990; Selladurai, 2002; Davidson, Waterworth, Williams, & Partington, 2003).

Table 2
Compare and Contrast Between BPR and TQM

Total Quality Management (TQM)	Business Process Reengineering (BPR)
Requires top leadership support	Requires grass roots support
Focus on incremental and regular improvements	Focuses on considerable results
Slow change based on culture's ability to adapt	Drastic change in both culture and organization structure
Focused to address problems, relatively low risk	Impacts cross-functional groups at once

Hammer and Champy (1993) contended that the incremental steps of TQM are not sufficient and radical restructuring of processes from the top down are needed. BPR became popular when western managers became frustrated with pace of their TQM programs (K. Leach, 1996). K. Leach (1996) contended that TQM is comprehensive and sustainable; making it more likely to succeed than BPR. Unlike BPR that requires quick wins to improve quality, Gharneh et al. (2005) asserted that leaders need time and sustained commitment to improve quality.

ISO 9000

ISO 9000 is a set of quality assurance standards established by International Organization of Standardization (ISO) in 1987 as an attempt to develop internationally recognized standards within a quality system (Guzzetta, 1993; Hafiz and Khan, 1999; Walsh, Wilson, & Needy, 2003). The standards establish a baseline of documented processes that are verifiable with third party auditors (Guzzetta, 1993). Cianfrani, Tsaikals, and West (2001) asserted that ISO certification promotes a process driven quality management system. Walsh et al. (2003) asserted that ISO certified organizations achieve superior performance, but contended that certification costs are more readily offset by higher revenues. Conversely, Boiral and Roy (2007) contended that the effectiveness of ISO 9000 standards as part of an organization's quality system is not conclusive. According to the American Society for Quality (2000) ISO has eight quality elements:

1. Customer Focus – Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations.
2. Leadership – Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.
3. Involvement of people – People at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit.

4. Process approach – A desired result is achieved more efficiently when activities and related resources are managed as a process.
5. Systems approach to management – Identifying, understanding and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its objectives.
6. Continual Improvement – Continual improvement of the organization's overall performance should be a permanent objective of the organization.
7. Factual approach to decision making – Effective decisions are based on the analysis of data and information.
8. Mutually beneficial supplier relationships – An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value (p. 43).

Boiral and Roy (2007) contended that ISO 9000 effectiveness can be traced to internal and external forces present during the certification process. They asserted that external pressures are not sufficient to improve an organizational performance. The internal forces are limited to the employee trust, commitment, and criticism to ISO standardized process requirements (Boiral & Roy, 2007). Watkins (2005) contended that leaders should view their ISO quality system as more than documented procedures and a certified quality management system used for reducing costs; rather, leaders should view these enablers in the supplier selection process.

When compared to TQM, Scheuermann and Zhu (1999) asserted that ISO is process based and validated with third party certification, making it less subjective and more successful than TQM. ISO remains a key part of supplier certification (Guzzetta,

1993; Zaczewski, 1993). Chen, Ching, and Huarng (1999) contended that implementing both TQM and ISO combined together could increase organizational performance in product quality, increased sales, and reduced costs.

Malcolm Baldrige National Quality Award

The Malcolm Baldrige National Quality Award (MBNQA) was established in 1987 for, "in an effort to promote quality improvement initiatives" (Cazzell & Ulmer, 2009, p135). In their review of quality, Aspinwall and Yusof (2000) contended that the Baldrige criteria provide a framework for organizations to assess their progress with TQM. Hirtz (2002) and Hirtz et al. (2007) investigated the relationship between leadership and quality systems using the MLQ and quality questionnaire designed to assess workers perceptions of quality. Their analysis yielded acceptable alpha values greater than 0.70 with positive correlation between transformational leadership and the perception of quality management implementation.

Cameron and Winn (1998) contended that leadership is important in organizational effectiveness. Spong (2007) asserted that the MBNQA criteria accommodates other quality initiatives, but requires organizational leadership to yield business results. The MBNQA criteria generate a score for organizations to monitor and gage improvements in their quality management system (NIST, 2008). Evans and Jack (2003) concluded strong canonical correlation between latent variables associated with MBNQA criteria and organizational performance by examining 307 companies in various manufacturing industries. Their results supported perception that improving internal management or leadership results improved external or business results. Companies wanting to improve their score and subsequent progress can incorporate the MBNQA

criteria in other quality initiatives like the Balanced Score Card (BSC). Kaplan and Norton (1992 & 1993) contended that the BSC is a management and measurement system that drives results and improves quality. Schwartz (2005) contended that the BSC which emphasizes customer, business processes, organizational learning, and financial performance can increase their Baldrige score.

G. Calhoun et al. (2007) contended that transformational leadership traits contributed to organization's success at winning the MBNQA. DeBaylo (1999) contended that leadership is a core concept in the MBNQA criteria. He asserted that MBNQA offers a more comprehensive view of leadership systems. According to J. Calhoun (2002) The Malcolm Baldrige National Quality Award criteria is based on seven concepts, see Table 3.

Table 3
Measurement Elements of the Malcom Baldrige Quality Award

MBNQA Items	Areas to Address
Leadership	Management leadership
	Values, direction, and citizenship
Strategic Planning	Organizational strategy
	Translating strategy to action
Customer & Market Focus	Understands the voice of the customer
	Focus on customer relationship
Information & Analysis	Measuring and analyzing performance
	Management of information
Human Resources	Inspiring and motivating workforce
	Employee knowledge management
Process Management	Business and process management
	Linkages for entire value chain from supplier to end user
Business Results	Financial performance
	Customer satisfaction

There is strong correlation between the self-assessment process and external business results (DeBaylo, 1999; Leach 1994; Evans & Jack, 2003). Leach (1996) asserted that organizations fail when ineffective leaders are overseeing the effort. When compared to other quality systems like ISO certification, the Baldrige criteria are more

complex because of its business performance elements. Some companies have experienced varied results in their business performance (Harry & Schroeder, 2000).

Leadership Styles

Many agree that a complete leadership theory does not explain cause and effect in an elegant manner (Frank, 1993; A. Gordon & Yukl, 2004; Ohmae, 2005; Santora, 2007). This is further illustrated by the hundreds of studies over the past 50-years that have not agreed on behavior categories that define great leaders (A. Gordon, Yukl, & Taber, 2002). There are numerous styles, traits, behavior, and collective descriptions that combine components of leadership that make organizations successful (Smallwood & Ulrich, 2007a & 2007b; Smallwood, Ulrich, & Zenger, 2000).

The role of leadership in supplier evaluation is not thoroughly captured (Anatharaman, Deshmukh, & Muralidharan, 2002). Bayraktar and Cebi (2003) asserted that the development of supplier selection models based on tangible factors with leadership referenced as a sub-level consideration indicate that some progress is being made to exploring leadership elements. Prajogo (2006) researched manufacturing firms between 1994 and 2001 and concluded that effective leadership was a necessary precursor to effective implementation of a quality program. Prajogo (2006) concluded that his cross-sectional research was not solely longitudinal and further research that focused on “soft” factors e.g. leadership, would be appropriate.

Researcher Dennis Likert (1967) identified leadership processes or what is referred to as contemporary leadership traits and compared them against different management systems and rating their effectiveness. His work helps to illustrate the evolution of leadership theory, specifically modern day transactional and

transformational leadership. His higher performing organizations were similar to Maslow's Hierarchy of Needs. Likert (1967) proposed that superior leadership creates higher functioning organizations. According to Bennis (1991) there are four enduring characteristics of leaders: 1) adaptive capacity, 2) engaging others, 3) voice, and 4) driving purpose.

Krumwiede and Lavelle (2000) researched top manager's personality preferences of 111 leading companies using the Myers-Briggs type indicator (MTBI) and TQM characteristics. They asserted that top managers whose personality type N or creative, goal oriented visionaries will create a culture of TQM. Their approach was to reduce the survey data dimensionality to a single outcome variable. This created an overall score on the Deming questionnaire. Statistical analysis using analysis of a variance (ANOVA) was chosen due to its relative strength. Their research concluded that managers opened to new opportunities, which effectively communicate and develop relationships were more conducive to TQM. Krumwiede and Lavelle (2000) recommended further study that examines leadership traits and their effect on quality management. This research will follow the approach of Bennis and develop a single quality score using Wu's quality survey.

Transactional Leadership

Transactional leadership multi-dimensional traits include: contingent reward, active management by exception and passive management by exception shown in Figure 3 (Hartog, Koopman, & Van Muijen, 1997). Transactional leaders motivate their followers with offers of rewards, in effect attempting to satisfy their lower level material needs (Gardner & Cleavenger, 1998). This is illustrated by Maslow's hierarchical needs.

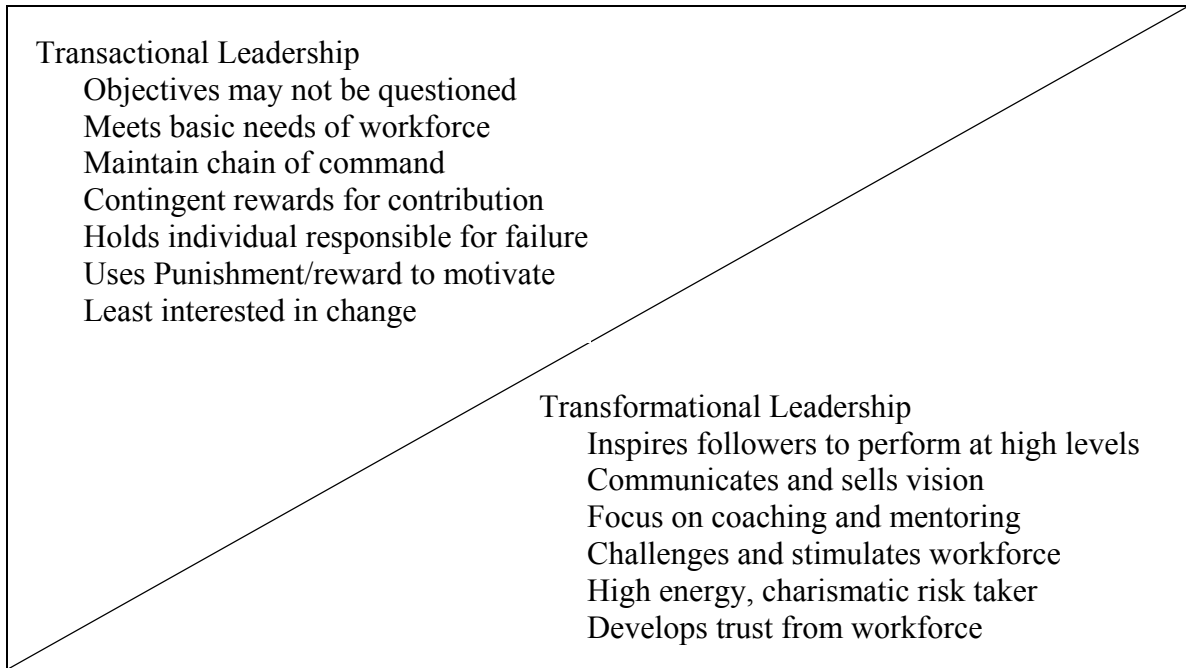


Figure 3. Transactional and Transformational Leadership Continuum.

Maslow (1943) asserted there are five sets of goals or “basic needs.” He listed them from most basic, to most advanced: physiological, security, Social, Ego, and Self-Actualization, see Figure 4. Maslow (1943) contended that individuals seek out to satisfy lower level needs first and move to higher levels. Getting individuals to relinquish their own self-interest requires that they have some basic level needs already addressed. Leaders can use Maslow to recognize these needs and put them in the appropriate context of the modern business environment. Wortman (2001) contended that understanding Maslow’s Hierarchy of needs is necessary to influence an employee’s attitudes and behaviors.

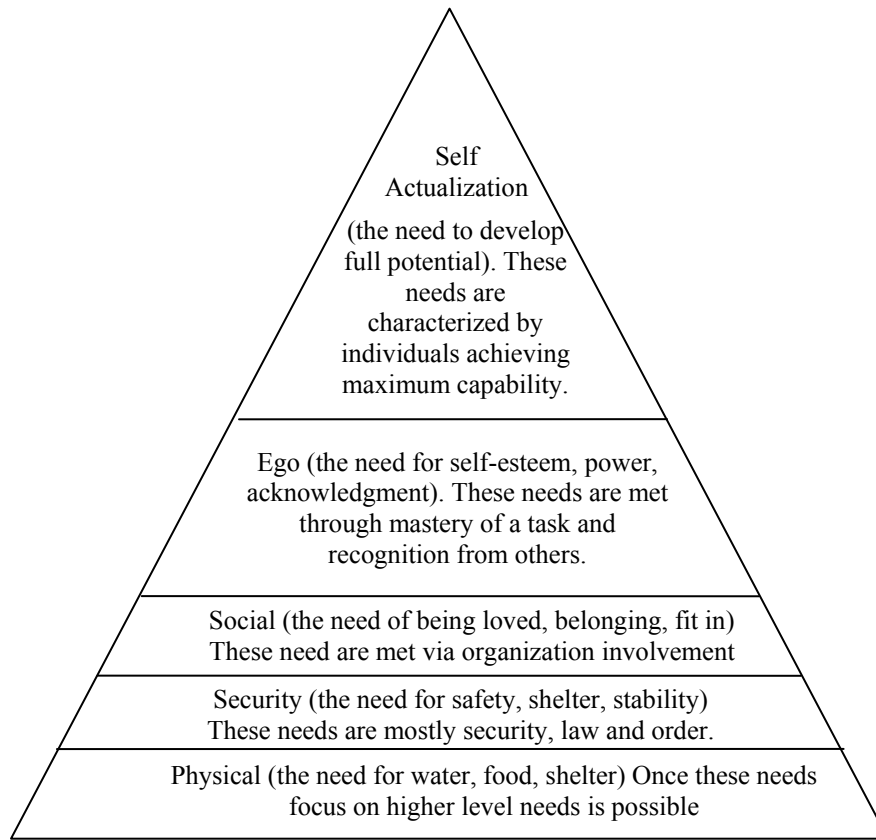


Figure 4. Maslow's Hierarchy of Needs.

Transactional leadership model does not go far enough in building trust and mobilizing the work force to sacrifice for the greater good of the company (Avolio, et. al, 1998). Transactional leadership traits, while not labeled as such but were observed by Zaleznik (1977) when he noted: "Managerial leadership does not necessarily ensure imagination, creativity, or ethical behavior in guiding the destinies of corporate enterprises" (p 67).

However, transactional leadership can be effective under certain circumstances, similar to strategies used by situational leadership. Atwater and Lau (1997) contended that the military has long used punishment, similar to transactional leadership traits, as a strategy to gain compliance and motivate its followers. Avolio and Jung (2000) examined

the effects transactional and transformational on follower's performance. They rated quantity, quality, and satisfaction in the student's ability to contribute the schools mission and vision. They asserted that transformational leadership had a positive effect follower performance via trust and values and that transactional performance would not. Using the MLQ they used two confederates one exuding transformational, the other transactional leadership traits. The results of their statistical analysis showed that transactional leaders tend to develop contingent trust from their followers. The transactional leader tended to gain more quantity at the cost of quality. They asserted that future studies should include studies in business setting. Atwater and Lau (1997) asserted similar conclusions on transactional leaders' contingent trust. As long as the followers consistently performed, they were consistently rewarded. Trust is developed, but only as long as performance standards are met. Avolio and Jung (2000) asserted that transactional leaders do not attempt to realign to their followers values they simply focus on meeting their material needs.

Laissez-faire Leadership

Laissez-faire leadership is a reactive leadership that manages by exception and generally avoids intervention (Hirtz, 2002; Hirtz et al., 2007). This leadership style is marked by a general failure to take responsibility for managing (Eagly, Johannesen-Schmidt Van Engen, 2003). Beer (2003) concluded in an analysis of twelve companies that laissez-faire leadership style contributed to poor quality performance and ineffective implementation of a total quality program. Hartog et al., (1997) concluded that laissez-faire management positively correlated with certain traits associated with transactional management or management by exception. This illustrates the challenges facing researchers when dealing with respondent's perceived impressions and the leadership continuum that does not lend itself well to discrete characterization. Barbuto (2005) analyzed 186 leaders with the MLQ and Motivation Sources Inventory (MSI) and using simple statistics and correlation analysis. He concluded that most "conceptualizations" of leadership dismiss laissez-faire because it represents a lack of leadership (p.27). Bass (1985) categorizes this leadership style as a dimension of transactional leadership.

Transformational Leadership

Transformational leadership depends on individual exchanges between leaders and followers (Harvey, 2002). Zaleznik (1970) identified leaders with certain traits that included: substance over form, charismatic, and problem solving as having positive impact in their organization. Though Zaleznik (1970) cautioned that charismatic leaders using the "total" approach have historically been authoritarian, a reference to political leaders in dictator roles around the world. Transformational leadership builds the trust

and commitment needed to improve organizational performance (Behery, 2008; Avolio et al., 1999). According to Kellerman (2004) transformational leadership is especially effective in organizations where the followers are highly educated and care deeply about their work. Transformational leadership traits are prevalent in high performing organizations implementing total quality systems (Avolio et al., 1999).

Transformational leaders have multidimensional traits that include: charisma, inspiration, individual consideration, and intellectual stimulation see Figure 3 (Gardner & Cleavenger, 1998; Hartog et al., 1997). One of the advantages transformational leaders have is their access to charisma to mobilize their followers, develop new ideas, and implement change (Avolio, Kahai, & Sosik, 1998; Mathews, 2006). House and Sprangler (1991) examined the leadership of political leaders and found charisma to be an important element of transformational leadership.

According to Kuzmenko, Montagno, and Smith (2004) charismatic leadership is the foundation of the transformational leaders. Followers of a transformational leader are inspired to forgo their own needs in order to contribute to the organization's goals (Eagly et al., 2003). Schrujjer and Vansina (1999) contended that transformational leaders flourish in times of crisis. According to Kuzmenko et al., (2004) transformational leaders are most successful in a fast paced environment where the culture is proactive, empowered, and inventive. Fiol, Harris and House (1999) examined 42 speeches of twentieth century U.S. presidents to examine the strategies to effect change. They hypothesized that the charismatic leaders will shift their language pattern that uses negative references early in the change process and less negative references later as well as higher levels of abstraction. These abstractions were used to engage and to help their

followers visualize the change. Foil et. al (1999) expected to see much lower levels of abstractions from non-charismatic leaders. They concluded that charismatic leader uses carefully crafted communication techniques using inclusive language, expressing high performance standards, and emphasizing the follower's ability to achieve the desired expectations of the leader. This research illustrates the challenge in determining the role of charisma and its importance in leadership. Charisma is an element of transformational leadership and indirectly referenced in the MLQ used in this research.

In contrast, some research has indicated that charisma is less important to effective leadership. In this research the MLQ will assess perceived leadership traits in an organization. The impact of charisma on followers can lead to bias especially if the followers infer the leader is effective, but uses inappropriate strategies. Barbuto (1997) asserted that charisma is not a key element of transformational leadership. Gardner and Cleavenger (1998) sampled 149 business graduates to rate leaders they studied using the MLQ and the Leadership Impression Management Questionnaire (LIMQ). Using ANOVA to analyze the variance in ratings across leaders that were converted to eta coefficients they were able to estimate inter rater agreement. They concluded that charisma has its limits especially when used with darker strategies like intimidation and self-promotion. Further, effectiveness can be overlooked by followers when the charismatic leader that uses these darker strategies. Kirkpatrick and Locke (1991) contended that common traits among effective leaders include: drive, motivation, honesty, self-confidence, cognitive ability, and knowledge of the business. In his research Kirkpatrick and Locke (1991) contended that it was less clear that charisma had any significant effect in organizational effectiveness and outcomes. He identifies

charisma, creativity, and originality as “traits with less clear-cut evidence of their importance with leadership” (p. 56).

Gary (2002) asserted that charismatic leaders reach their followers with an emotional appeal, but have limited impact on their organizations. Collins (2001) would agree with Kirkpatrick’s view on charisma as well. Collins illustrates the value of charisma with his analogy of a company as a massive fly wheel who experience what he calls, breakthrough success, only after the flywheel is put into motion and kept in motion. Collins (2001) contended that charisma gets the organization engaged and aligned to make the first push, but it is not the prime mover in getting and maintaining organizational success. Collins and Porras (1996) asserted that leaders’ ideology should be inspirational, an indirect reference to charisma, but stresses consistency and discipline for sustainability as ultimate success factors. Leaders are different and modest, but forceful and demanding. Badaracco (2002) confirms this by asserting that effective leadership is “quiet” and is the exception, compared with high profile leaders. Collins’ (2001) contended that the most successful leaders that delivered sustained results were anything but charismatic. He asserted that dichotomies exist with what he coined “level five leaders” listed below:

1. Level 1 Highly Capable Individual: Makes productive contributions through talent, knowledge, skills, and good work habits.
2. Level 2: Contributing Team Member: Contributes to the achievement of group objectives; works effectively with others in a group setting
3. Level 3 Competent Manager: Organizes people and resources toward effective and efficient pursuit of group objectives.

4. Level 4 Effective Leader: Catalyzes commitment to and pursuit of clear and compelling vision; stimulates high standards.
5. Level 5 Leader: Builds enduring greatness, combines personal humility, and professional will (p 70).

Barbuto (1997) asserted that charisma is too often confused with inspirational leadership. Inspirational leaders look to empower their followers, charismatic leaders have a powerful effect on their followers such that the followers develop dependencies on the charismatic leader (Barbuto, 1997). Mumford and Van Doorn (2001) contended that exceptional leadership is not always charismatic. This is in contrast to emphasis on charismatic and inspirational traits when describing effective leaders (Antonioni, 2003; Bass, 1990a). Bass (1990a) and Antonioni (2003) contended that employees have a high degree of trust and confidence in charismatic and inspirational leaders. Rather than characterize levels of effective leadership like Collins (2001), Bass Stogdill (1990b) contended that characteristics of leaders can be viewed from two perspectives: the least effective leader or transactional leader, and the most effective leaders or transformational leader.

Servant Leadership

This leadership style was identified by Greenleaf (1977) as an offshoot of charismatic leadership, though unlike a single trait, it resembles a broader theory. The main element to servant leadership is leaders must want to serve first, and then lead second. Servant leaders tend to have strong listening, empathy, and stewardship skills (Spears, 2004). Bocarnea and Dennis (2005) asserted that servant leadership expands

another dimension of effectiveness over transformational leadership. Greenleaf defined ten characteristics of servant leaders (Greenleaf & Spears, 1998):

1. Listening: Valued for their communication and decision-making skills and deep commitment to listening to others intently.
2. Empathy: Strive to understand and empathize with others and assumes good intentions of workers.
3. Healing: Learning to heal one's self and one's relationship with others and making whole those people they come in contact with.
4. Awareness: Self-awareness strengthens the servant leader, also aids in understanding ethics and values
5. Persuasion: Uses persuasion rather than positional authority, seeks to convince others rather than coerce.
6. Conceptualization: Seek to nurture their abilities to “dream great dreams” and stretch their thinking to encompass broader-based conceptual thinking.
7. Foresight: ability to foresee the likely outcome of a situation and understand the lessons of the past and likely consequences of the future.
8. Stewardship: assumes first and foremost the commitment to serving the needs of others.
9. Commitment to the growth of people: believe that people have intrinsic value beyond their tangible contributions as workers.
10. Building community: seeks to build community among those who work in a given institution (pp. 5-8).

Unlike transformational leadership, which is organizational focused, servant leadership is individual focused (Bocarnea & Dennis, 2005; Spears, 2004). Humphreys (2005) performed a qualitative analysis of two historical leaders. He assessed the leaders in the context of crisis situation. He concluded that servant leadership style is better suited for stabilized organizations in contrast to transformational leadership that lends itself to dynamic organizations. In the context of this research, it illustrates how transformational leaders excel in stressful times and organizations can expect higher level of performance from these leaders. Gonzalez and Guillen (2001) concluded in two case studies that TQM requires multidimensional leadership utilized by servant leaders with emphasis on service in contrast to transformational leadership that emphasize influence.

Servant leaders focus internally on their organization and view their role as enablers in service to their organization (Owen, 2000). Owen (2000) contended that servant leaders share power with their employees to achieve the organization's goal. These leaders are consistent in character with high performance standards, empathy, and moral love for their followers (Bocarnea & Dennis, 2005). They view their role as an enabler for the organization (Covey, 2006). Servant leader tend to focus externally and are motivated by what they can do for others and share their power and authority (Owen, 2000). This contrasts with the situational leader who would find this hard share power especially if they viewed the need for coercive power in a low maturity level organization (Frank, 1993).

Situational Leadership

Situational leadership is based on premise that every situation is different, thus requiring a different leadership style (Grover & Walker, 2003). This leadership style is based on directive and supportive behaviors toward the followers (Irgens, 1995). While directive behaviors is characterized by rules and oversight, and supportive is characterized by listening and encouraging; Irgens (1995) contended that this not optimized. Irgens (1995) asserted that a follower may require multiple leadership styles at once that include transformational and transactional leadership traits. Blanchard et al. (1979) asserted that effective leaders influence behavior by proper use of power and an understanding of how power influences followers of different maturity or development levels, see Figure 5.

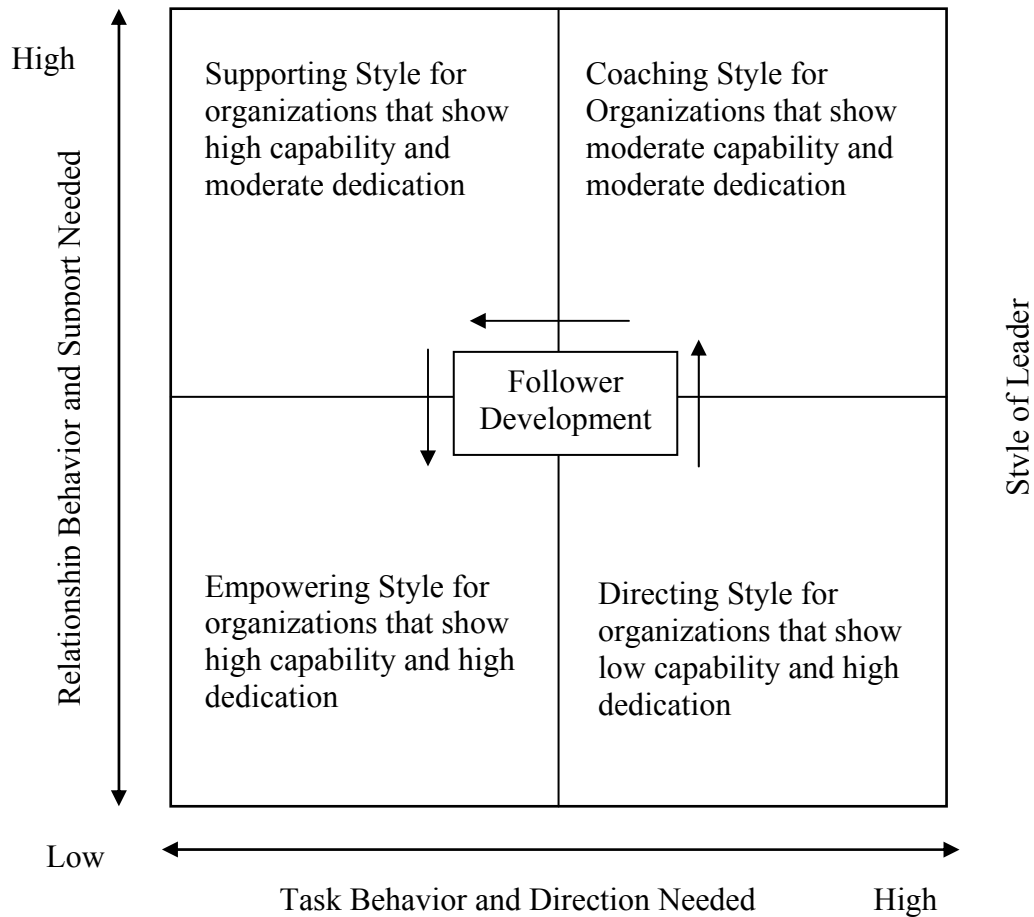


Figure 5. Situational Leadership Styles and Follower Development.

A. Gordon, Taber, and Yukl (2002) considered a cohort of MBA students and middle managers. Their quantitative research surveys were made up of two different research questionnaires designed to measure hierarchical leadership classifications. They examined the intercorrelations of twelve behavior scales and concluded in their research that three metacategories exist that describe the following leadership behaviors: tasks, relationship, and change. Since each behavior could have multiple objectives these categories were viewed as separate dimensions rather mutually exclusive behavior, but concluded that leaders might use different behaviors in different situations, reminiscent of

situational leadership. D. Gordon (2002) research examined key elements similar to transformational leadership traits being examined in this study. They contended that future research should examine the relationship between leadership behaviors with their effectiveness.

According to Blanchard, Hersey, and Johnson (2001) leaders can increase their probability of success if they recognize that a specific leadership style is less important than the appropriate use of power for the situation. They asserted that leaders switch their use of power base as needed to fit their organization based on the situation they face. Hersey et al. (2001) contended that it is necessary to use coercive power in organizations of low maturity and effectiveness. Leaders' transition toward more effective leadership behaviors as the organization matures. This type of leadership does not mean that the leader violates ethical values. According to Daft (2004) value based leaders engender high levels of trust and respect from employees. Grover and Walker (2003) asserted that leaders can impact quality of their product and services in their organization when they recognize what their followers require at each phase of change.

Quality and Leadership Linkages

TQM requires leaders to motivate and inspire their followers beyond their self-interest and focus on the organization (Bass, 1997). Leadership from managers is central to the success of process improvements (Boaden, 1997; Savolainen, 2000). Leaders need superior leadership strategies to implement their quality management system (Savolainen, 2000). Taylor and Wright (2003) contended that leaders must have both knowledge of quality methods and the appropriate leadership traits that motivate and engage their followers. Kannan and Tan (2004) contended that quality problems are more easily

resolved when a strong relationship exists between leaders and followers. Follower's satisfaction and commitment depend on innovative and supportive cultures supported by their leaders (Crawford & Lok, 2005). Hersey et al. (2001) asserted that leaders use persuasion to win their follower's commitment. Eisenbach, Watson, and Pillai (1999) contended that transformational, charismatic, and visionary leaders can implement change by displaying the appropriate behaviors at various stages of the transition process. This is similar to the situational leader, but without the focus on power. Campbell (2002) contended that effective leadership is made up of multiple components, but focuses on style not individual traits.

Hoyer and Hoyer (2001) contended that quality as a concept has been around for centuries and focused on meeting customer's expectations. The exact definition has been debated, but most have similar themes, see Table 4.

Table 4
Summary Views of Quality from Industry Experts

Quality Experts	View of Quality
Philip Crosby	Conformance to requirements Defined, measurable and monitored
Edwards Deming	Multidimensional Defined by customer Has different meaning
Armand Feigenbaum	Multidimensional Defined by customer Must be comprehensive
Kaoru Ishikawa	Changes to customer preferences Defined by customer Price must be considered
Joseph Juran	Free of defects Defined by customer
Robert Pirsig	Cannot be defined Know it when you see it
Walter Shewhart	Subjective: customer wants Objective: product capabilities Defined quantitatively

Deming, Crosby, and Juran made significant contributions to TQM and identified leadership traits key components in an organization's quality program (Gee et al., 2000; Hunt, 1992). Deming would require organizational leaders to agree to his fourteen points before he would assist them (American Society for Quality, 2000). In his Fourteen Points, Deming calls for strong leadership while Crosby's Fourteen-Step Quality Improvement Program stressed management commitment (Wortman, 2001). Wortman (2001) asserted

that Juran's Quality Trilogy made indirect reference to leadership traits when he stressed planning, improvement, and control to sustain effective quality programs.

Supplier Selection

The supplier evaluation process is used as a preliminary investigatory tool to assess suppliers (Weiss, 1998). The evaluation process involves self-assessment surveys by the supplier or site surveys by the prospective customer. Leadership elements are not commonly used criteria in the supplier evaluation process (Simpson, Siguaw, & White, 2002). Kannan and Tan (2003) contended that quantitative elements are preferred because they are easily measured and qualitative elements are generally avoided. They contended that qualitative factors such as "management capability" or leadership elements should be included in the survey criteria (p. 473).

Leadership traits considered in this research are qualitative elements that have not been fully considered in prior research. Simpson et al. (2002) reviewed 299 suppliers to determine if firms are using a formal evaluation process and if they transitioned to other criteria other than cost, quality, and delivery. Formal evaluations were used by 54.8% and supplier self-assessments were used by 35.7% by the respondents. Evaluation methods were split between 66.7% for ranking systems and 29.8% for weighting systems. Consideration beyond price was noted in 45% of respondents' evaluation criteria. Evaluation criteria for continuous improvement or total quality management were used 9.2% and leadership only used 3.1% (Simpson, Siguaw, & White, 2002). The five supplier evaluation systems commonly used are: weighted-point, criteria or ranking, cost based, analytical hierarchy process, and analytical networking process. (Anantharaman, & Deshmukh, Muralidharan, 2002; Bisson & Kumar, 2008; Chen & Yang, 2002; Carter

& Ho, 1988; Dickson, 1970; M. Lee, Lee, & Jeong, 2003; Monczka & Trecha, 1988; Monczka & Trecha, 1988; Jaramillo & Teng, 2005).

The weighted-point method places subjective weight assignments on criteria elements (Al-Faraj, 2006). This two staged approach places relative importance on the goal and criteria based on specific needs of the company see Figure 6. Weighted assignments for cost and on time delivery, measured in dollars and percentage respectively, are combined in the selection process. Seydel (2005) contended that this process is a refinement and superior to a single evaluation process, but requires accurately weighted assignments to each evaluation criteria.

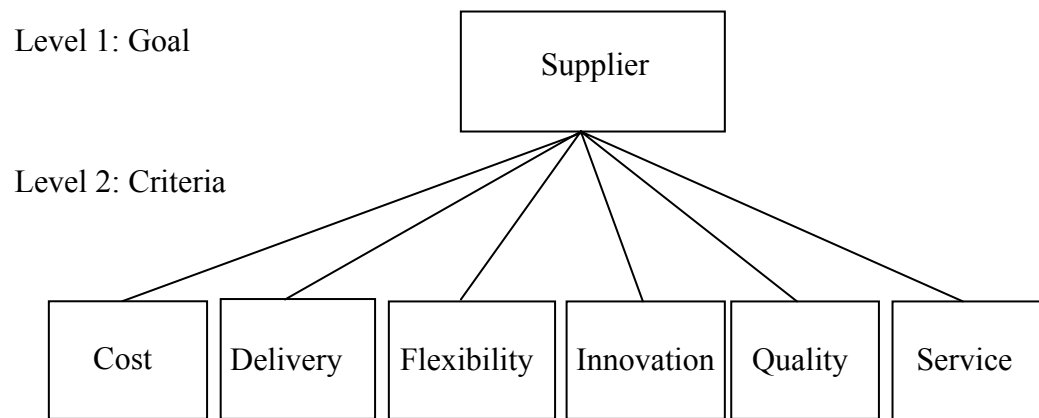


Figure 6. Supplier Selection Model with Traditional Criteria Elements.

The criteria or ranking method can manage both qualitative and quantitative data with different units. Subjective rankings prioritized based on company needs are included with quantitative rankings. Weighted assignments for cost and on time delivery, measured in dollars and percentage respectively, are combined in the selection process (Braglia & Petroni, 2000). Braglia and Petroni (2000) used multivariate statistical methods to evaluate 23 suppliers in traditional criteria elements and management capabilities that include elements of leadership. They contended that inherently large

amounts of data attributed to using both qualitative and quantitative criteria are difficult to manage. Multivariate analysis reduced the data into more manageable data

The cost based approach spans single elements such as unit cost to total cost of ownership which includes unit cost, scrap, warranty, and inspection. Cost based method based on multiple quantifiable elements develops supplier cost based ranking system (Chen & Yang, 2002). Bhutta and Huq (2002) contended that cost based method prequalifies suppliers, provides comparables among suppliers and is easily understood.

The cost based method has no leadership or qualitative elements and emphasizes quantitative data related to cost (Monczka & Trecha, 1988). If accurate costing information is available, a cost profile can be built and used as an ongoing management tool. In contrast, Degraeve, Doveran, and Roodhooft (2005) contend that most selection decisions made on price alone and result in higher total cost when suppliers' quality is low. Smith (2007) contended that quality is not the first priority in supplier selection, but is part of multi-dimensional criteria that focus on total cost of ownership. This approach is most useful for established relationships when the decision to use a supplier has already been made.

Two models widely used for multi-criteria selection are the Analytical Hierarchy Process (AHP) and the Analytical Network Process (ANP) (Jaramillo & Teng, 2005). Humphreys, Mak, and Yeung (1998) asserted that the multi-criteria analysis technique rectifies the problems inherent in the weighted point and cost methods by measuring several attributes or elements into a single score. Humphreys et al. (1998) continues that this approach allows for multiple units of measurement, e.g. dollars, percentage, or days

in contrast to the other methods that require subjective judgment efforts to standardize elements being measured.

AHP is the most widely used supplier selection model (M. Lee et al., 2003; Bisson & Kumar, 2008). Using pair wise analysis to arrange criteria into a hierarchy, companies can organize and analyze large amounts of unstructured data (Tullous & Utecht, 1994; Hemaïda & Schmits, 2006). Saaty (1980) introduced AHP as a means to combine both quantitative or the tangible with the qualitative or intangible supplier attributes. The combination of both qualitative and quantitative measures by subjectively ranking and weighting key factors important to the customer make AHP appealing (Haq & Kannan, 2006; Barbarosoglu & Yazgac, 1997). While AHP has been used to develop a supplier selection model using both quantitative and qualitative criteria, it usually focuses on traditional evaluation factors, previously shown in Figure 7 (Hill & Nydick, 1992; Gnanasekaran, Manimaran, & Velappan, 2006; Bayazit, 2006; Dickson, 1970). F. Chan, H. Chan, and Lau H. (2007) applied this model in a case study of a Hong Kong airline to determine if complex multi-dimensional elements that include TQM and management commitment. In the context of their research management commitment constructs were similar to transformational leadership traits. F. Chan et al. (2007) determined that TQM programs ranked second behind traditional performance elements that included cost, satisfaction, and quality. Performance sensitivity analysis revealed suppliers with TQM programs ranked highest even when it scored lower in other categories.

F. Chan and H. Chan (2004) contended that AHP complexity reduces its appeal. Sarkis and Talluri (2002) asserted that AHP's strict hierarchy is less appealing and less

accurate in complex decision situations. Excessive criteria can overload decision makers and degrade supplier selection process effectiveness (F. Chan et al., 2007). Bhagwat and Sharma (2007) contended that AHP is more effective when combined with qualitative metrics. Eskandari and Rabelo (2007) asserted that decomposition of complex multi-level criteria creates uncertainty and larger variance. They contended that rank reversal is common in pair wise analysis that requires decision makers make too many qualitative judgments from imperfect information. Demirbag, Koh, Sevkli, Tatoglu, and Zaim (2007) contended that multi-criteria weakness is their inclusion of both quantitative and qualitative criteria. Use of expert knowledge to assign weights to each criteria take excessive time and varies from person to person (Bisson & Kumar, 2008).

ANP is a relatively new evaluation process that gives weighted consideration to management's strategic initiatives (Sarkis & Talluri, 2002). Sarkis and Talluri (2002) contended that ANP is widely accepted and used in industry. Unlike AHP that does not recognize the multi-level effects in the selection process, ANP is capable of handling multi-level interdependence (S. Chen & Lee, 2006). Bayazit (2006) asserted that ANP offers more insight into the supplier being considered, but at a cost. It requires more comparisons and effort from the purchasing department doing the analysis, limiting its adoption. Sarkis and Talluri (2002) contended that ANP is robust and potentially more accurate than AHP, but can become complicated as the evaluation criteria expand to include multiple elements. Sarkis and Talluri (2002) contended that "management capability" a reference to management's leadership as a criteria needing further refinement (p 22).

Summary

This chapter provided an extensive literature review of quality systems, leadership styles, quality and leadership linkages, and supplier evaluation methods. The first part of this chapter discussed quality systems and quality system assessment methods. To develop a framework around this research several quality systems were discussed. This included a review of TQM, BPR, ISO, MBNQA, and quality philosophy from some of the greatest minds in the field. The MBNQA quality system assessment method used in this research incorporates many of the various quality system elements discussed.

The second part of this chapter discussed the evolution of leadership styles, leadership strategies, and follower drivers that make leaders successful. It examined both contemporary leadership characterizations, which is a main focus of this study, but also research from earlier and lesser known sources that have contributed to the field. Distinction between modern views of leadership and earlier works that referenced management capability were discussed as well. The MLQ and its use in various studies to evaluate transactional and transformation leadership traits was reviewed.

The third part discussed the theoretical linkages between quality systems and leadership traits. Leadership traits and their impact on followers to commitment and sustain quality system improvements. The fourth and final part reviewed the supplier evaluation and selection process that connects the proposed theoretical supplier leadership and quality model framework. This section reviewed weighted-point, criteria or ranking, cost based, analytical hierarchy process, and analytical networking process evaluation methods. Their use traditional quantitative criteria and qualitative traits as main or sub criteria were reviewed.

CHAPTER 3. METHODOLOGY

This study will use data from two questionnaires, Bass' MLQ and Wu's quality survey to assess perceived organizational leadership traits and quality system effectiveness respectively. This research will analyze perceived leadership for suppliers to the power supply industry; specifically, the transformational, transactional and non-transactional leadership styles, and elements of the organization's perceived quality system. The quality elements examined include: leadership, information and analysis, strategic planning, human resources development and management, process management, and customer focus. A method that compares prospective supplier leadership traits to their quality constructs in a self-assessment survey could improve the supplier selection process.

Research Design

This research is a formal study to test hypotheses using statistical methods (Cooper & Schindler, 2003). Several research designs that investigated leadership traits and perceived organizational quality systems have used similar quantitative research methods used in this study (Seanor, 2004; Hirtz, 2002). Seanor (2004) used mixed methods that included quantitative methods using surveys and qualitative methods using face to face interviews. The later method provided a detailed context characteristic of a more narrowly focused qualitative study (Thomas, 2003).

A quantitative research method is chosen because it focuses on objective testing and verification of a theory that tests a hypothesis, and then measures or observes variables to obtain data for analysis (Creswell, 1998b). The statistical analysis used in a quantitative design also measures subjects attitudes and perspectives effectively (Shields

& Twycross, 2003). Qualitative and mixed models were examined and determined as unsuitable. There is no attempt to establish new or grounded theory, but to further existing theory into a new field in manufacturing focusing on the power supply industry.

Surveys are effective for gathering descriptive data and relatively inexpensive to administer (Frechtling, 2002). The surveys use a Likert scale with closed end responses to make coding easier. Interval data provides acceptable analysis methods using inferential statistics (Cooper & Schindler, 2003). All participants will sign a voluntary consent form. The populations studied are executives, upper, and middle managers that supply components or services to the power supply industry. The size of the population is approximately 250 suppliers to the power supply industry that include distributors and manufacturers in China, Mexico, and the United States. A non probability or convenience sample is being chosen in this study, which is less desirable than a random sample, but is needed to ensure a large enough number of respondents is collected (McGoldrick et al., 2001; Cooper & Schindler, 2003). Non response rate is not known at this time. Typical causes of non response include: dislike of survey content, embarrassment of ignorance of topic, or lack of time to complete the survey (Cooper & Schindler, 2003). To mitigate a non response rate the following procedure will be used:

1. Detailed letter outlining the purpose of the survey and reassuring respondents that data will be securely stored and anonymity will be maintained.
2. Early notification with advance mail out of letter describing the purpose of the research and the value of their participation.

3. Actual survey mailed out to respondents, again with detailed information on the purpose of the study, their role and the contribution their participation.
4. Email electronic copies to increase convenience and facilitate responses.
5. Follow-up letter or email to non-respondents.

Quantitative method is chosen because it is focused in scope and uses statistical evaluation tools. This positivist examination is deductive and emphasizes objectivity testing of a hypothesis (Amaratunga et al., 2002). Surveys provide an effective and economical means to gather data and strategies to minimize non-responses are well known (Cooper & Schindler, 2003).

Instrumentation / Measures

The two surveys being used are the Multifactor Leadership Questionnaire (MLQ) developed by Avolio and Bass (1993) and quality survey developed by Wu (1996). The MLQ developed by Bass and Avolio has been used extensively in over 100 previous studies. The MLQ 5x Short Form uses 45 questions to assess leadership traits. It is one of the most cited and validated methods for assembling leadership traits (Avolio & Bass, 2004; Gardner & Cleavenger, 1998). Reducing the data is simplified by a scoring method supplied by Mind Garden with the purchase of the MLQ.

The second survey is Wu's quality questionnaire that uses 34 statements to measure each of the seven criteria categories from the MBNQA and MQA to determine the organization's perception of quality. The Baldrige criterion is an overall framework used to validate management practices. The modified Baldrige assessment developed by

Wu will be used to ensure higher response rate by reducing the questions. This survey has been used in several studies cited in this research. It offers multiple quality dimensions and a single outcome variable or total quality score. The surveys will be mailed with return postage prepaid followed by emailed soft copies.

The independent variables in this study are the leadership traits. The MLQ will measure the occurrence of transformational, transactional, and non-transactional leadership using the Likert scale to provide adequate variance and sensitivity. The dependent variables are the perception of the organization's perceived quality. The quality elements examined are leadership, information analysis, strategic planning, human resources, process management, and customer focus. These individual elements will also be combined into a total quality score.

Data Collection

The data will be consolidated from the various suppliers using paper and electronic surveys. Organizational Permission Letters will be sent prior to contacting participants. Suppliers will receive several surveys in an attempt to receive multiple responses from one organization (Seanor, 2004). The manager will be asked to fill out the form and additional copies provided allowing the manager to disseminate the remainder forms to their peers or supervisors. This will increase the response rate from the supplier. The sampled population is multinational and will have various proficiency levels reading and writing in English. To increase response rate and lower the incidents of misinterpretation, each survey will be translated in Chinese and Spanish. The surveys will arrive in an 8 1/2" x 11" enveloped stapled together with an explanation of the research

along with a self-addressed stamped envelope. Emailed soft copies will be sent as well to facilitate higher response rates.

The surveys will be reviewed for completeness and irregularities and entered into Excel spreadsheets. Control data on respondent's education, years of experience, title will assist in identifying middle and senior managers who are the targeted group in this survey. The data will be coded to conceal the identity of the suppliers. Data will be entered into Statistical Package for Social Science (SPSS). Participants will be informed that total time to take both surveys is approximately 15 minutes each. Targeted time to complete and return surveys is two weeks. Follow-up with non responsive suppliers with emails and phone calls will be used to increase participation rates. All data will be securely stored on removable hard drives in a locked cabinet.

Data Analysis

MLQ and the quality survey use a Likert scale allowing for simple tabulation. Descriptive statistics and inferential statistics will be discussed, though the later will focus on multiple regression analysis. This research will use purposive sampling of a specific group of suppliers to power supply industry. Cooper and Schindler (2003) contended this is appropriate strategy in exploratory studies such as this research. Pre analysis activities will include a review of the data for omissions and errors. Descriptive statistics will identify outliers or data entry errors. Analysis will include reliability analysis or Cronbach's alpha, pair wise analysis to examine correlation of leadership traits and quality system elements, and regression modeling.

Validity and Reliability

Copper and Schindler (2003) contended that validity has three forms: Content, construct and criterion. Content in the context of this research refers to the degree that both the MLQ and quality questionnaires measures leadership and quality systems respectively. Between two and four leaders in operations will answer the surveys to ensure the appropriate data is received. This will help gauge participant's ability to understand the survey questions; which is common in quantitative studies (Steudel & Yauch, 2003).

The MLQ measures a continuum of leadership traits. The validity and reliability constructs of the MLQ have been confirmed in over seventy five studies in several countries for leaders with a range of responsibilities (McGoldrick et al., 2001; Seanor, 2004). The MLQ accurately assess leadership traits and is grounded in established theory (D. Gordon, 2002).

In this research the MBNQA and MQA are the foundation for Wu's modified survey. Wu's survey attempts to increase respondent's response rate with a significantly shortened survey, while accurately assessing quality organizations. Wu's research reduced the Baldrige criteria from over 130 questions to 34 using two methods: Artificial Intelligence technique using Neural Networks and standard linear regression. Limitations to Wu's survey begin with the low sample size in the original research. Subsequent research using Wu's work focused on both academic and manufacturing industries (Hirtz, 2002; Sadikoglu, 2003; Hirtz et al., 2007). Sadikoglu (2003) used elements of Wu's survey to identify organizations with effective TQM programs and their implementations

of work standards. Sadikoglu (2003) compared Wu's survey with four other TQM surveys and concluded that Wu's survey were more concise than the comparables.

Link and Scott (2001) concluded after analysis of 875 private-sector companies that those implementing and subsequently scoring high with the MBNQA criteria had benefited from improved performance. This is an indication that the MBNQA criteria has wide spread acceptance in evaluating quality systems with private-sector organizations.

Wu's survey has not enjoyed the widespread use as the full MBNQA criteria, but has been favorably compared and contrasted against several well known TQM assessment tools (Sadikoglu, 2003). Sadikoglu (2003) assessed perceived levels of quality using Wu's survey further illustrating its reliability in assessing TQM constructs. Increasing the validity and reliability constructs of Wu's assessment tool by expanding the questions to include the entire Baldrige criteria would remove the subjectivity concerns; however, this would create significant costs for the respondents to complete resulting in lowered participation (Wu, 1996).

Reliability in this research is defined by consistent results and contributes to this study's validity (Cooper & Schindler, 2003). There are multiple contributing factors to yielding reliable data in this research. Ideally the MLQ and quality surveys, which measure leadership and quality respectively, ask multiple questions on enough topics to ensure situational or transient errors don't interfere with the outcome (Cooper & Schindler, 2003). Hirtz et al. (2007) observed acceptable reliability with alpha coefficient (Cronbach's alpha) greater than 0.70 with the MLQ and Wu's criteria. Scores of 0.70 or greater are acceptable reliability coefficient (Nunnally, 1978). The exception to the study by Hirtz et al. (2007) was management by exception for the MLQ and customer focus for

Wu's criteria which was 0.54 and 0.58 respectively. Cronbach's alpha showed support for the hypothesis in Hertz's research, specifically that transformational leadership results in higher perceived quality. This hypothesis is part of this research as well.

Bass (1985) proposed the notion of the transformational or transactional leader using the MLQ to assess these traits. Bass followed up his initial research after a significant amount of research using his MLQ had suggested modifications or alternatives to his leadership model. He concluded that the MLQ's six scales had acceptable alpha coefficient, yielding internal consistency above 0.70 except for management by exception. This was attributed to the lower order leadership traits associated with management by exception and contingent reward. Bass (1985) noted that effective leaders shared both transactional and transformational leadership traits. Reliability of Wu's survey yielded acceptable alpha coefficient ranging from 0.69 to 0.90, though Wu (1996) contended that lower alpha values for new surveys are acceptable. Wu's survey has not been researched to the extent of the MLQ; however, its development based on the Malcolm Baldrige National Quality Award criteria and the significant reduction in questions contributed to its selection in this research.

Ethical Considerations

To ensure no harm to the participants occurs, special attention will be paid to ensure all data is coded without names or references to individual companies or specific industries in the supply chain. Participants will receive Informed Consent Letter and Confidentiality Agreements will be used to protect participant's data. This study will not draw conclusions about actual product quality or supplier performance to its customers.

All data will be coded to ensure anonymity and confidentiality. The participants will be informed of the nature of the study, how the data will be collected and used. Data will be stored electronically on a removable hard drive and stored securely with hard copies to ensure privacy.

CHAPTER 4. RESULTS

The results are divided into six sections. The first section is an overview, the second section discusses descriptive statistics, the third will discuss the reliability analysis, the fourth will discuss correlation analysis, the fifth section discusses the hypothesis tests and regression analysis, and sixth section will summarize this chapter. The overview will discuss the participants and review of the leadership traits or subscales used to measure transformational, transactional, and non-transactional leadership traits. The descriptive statistics will examine means, standard deviation, and distribution. The reliability analysis or Cronbach's alpha is calculated for each subscale. The Pearson correlation analysis will examine the correlation between quality and leadership elements. Assumptions of linearity and homoscedasticity are discussed and the regression analysis hypotheses test.

Overview

Leadership and quality data from companies providing goods or services to the power supply industry were examined. Of the 250 organizations considered for this study, 85 agreed to participate and a total of 70 complete surveys were received. Respondents included suppliers to power supply industry from the United States, China, and Mexico. Data was reviewed for completeness, coded, and entered into SPSS. The leadership elements or subscales of the independent variables are shown in Table 5. The quality elements or subscales of the dependent variables are shown in Table 6. Descriptive statistics measured range, mean, standard deviation, skew, and kurtosis. Reliability analysis or Cronbach's alpha was calculated for each subscale.

Table 5
Independent Variables, Leadership Elements or Subscales

Transformational Leadership Traits		Transactional Leadership Traits		Non-Transactional Leadership Traits	
Idealized Influence (attributed)	LIIA	Contingent Reward	LCR	Laissez-faire	LLF
Idealized Influence (behavior)	LIIB	Management by Exception			
Inspirational Motivation	LIM				
Individualized Consideration	LIC				

Table 6
Dependent Variables, Quality Elements or Subscales

Quality Elements	
Leadership	QL
Information analysis	QIA
Strategic planning	QSP
Human resources	QHR
Process management	QPM
Customer focus	QCF
Total quality	QTQ

To verify distribution of scores were normal and to determine if transformation was needed skewness and kurtosis was measured. Scatter plots analyzed the general trend of the data to assess relationship between variables. The Pearson correlation measured the linear relationship between leadership and quality subscales. Multiple regression analysis

was used to analyze the relationship perceived leadership traits and quality elements for the test of hypothesis.

Descriptive Statistics

The range, mean, standard deviation, skew, and kurtosis of the leadership subscales or independent variables are shown in Table 7. The mean, standard deviation, skew, and kurtosis of the quality subscales or dependent variables are shown in Table 8.

The leadership subscales shown in Table 7 ranged from zero to four. The transactional mean scores ranged from zero three. The transformational mean scores with the exception of individualized consideration were close to three. The kurtosis showed highest peak of a value higher than one for management by exception (passive). The skewness identifies shifts in the data where a negative skew indicates an elongated tail to the left or more data in the left of the tail than expected. Conversely, positive skew indicates an elongated tail to the right or more data in the right of the tail than expected. The skew for the leadership was slight positive. The data did not warrant transformation since the criterion of overtly skewed distribution of three was not met (Kline, 2005).

Table 7

Descriptive Statistics for Leadership Variables (N = 70). Note. Standard error for skewness is .29. Standard error for kurtosis is .57

Variable	Range	Mean	SD	Skew	Kurtosis
Idealized influence (attributed)	.50 to 4.00	2.72	.93	-.56	-.33
Idealized influence (behavior)	.75 to 4.00	2.69	.76	-.59	.21
Inspirational motivation	.75 to 4.00	2.86	.77	-.47	-.10
Intellectual stimulation	.75 to 4.00	2.66	.73	-.36	-.07
Individualized consideration	.50 to 4.00	2.44	.81	-.13	-.26
Contingent reward	.25 to 4.00	2.76	.85	-.53	.04
Management by exception (active)	.00 to 4.00	2.29	.82	.23	-.59
Management by exception (passive)	.00 to 4.00	1.31	.87	.70	.43
Laissez-faire leadership	1.00 to 4.00	1.04	.83	.90	1.44
Extra effort	.50 to 4.00	2.71	.84	-.24	-.50
Effectiveness	.50 to 4.00	2.76	.80	-.61	-.09
Satisfaction	.00 to 4.00	2.76	.92	-.49	.20

The mean was slightly higher than five with the exception of human resources and customer focus, which were below five shown in Table 8. The quality subscales ranged from one to eight. The skew of the variables was negative and were transformed using a power of two. This approach is consistent with normalization techniques in parametric tests used in this study (Sokal and Rohlf, 1995; Field, 2005). The transformation yielded skew indices below three and were used in the subsequent analysis.

Table 8

Descriptive Statistics for Quality Variables (N = 70). Note. Standard error for skewness is .29. Standard error for kurtosis is .57

Variable	Range	Mean	SD	Skew	Kurtosis
Leadership	1.25 to 7.00	5.51	1.01	-1.38	3.55
Information analysis	2.00 to 7.00	5.18	1.46	-.52	-.84
Strategic planning	1.00 to 8.75	5.54	1.74	-.85	.28
Human resources	2.00 to 6.83	4.82	1.26	-.67	-.44
Process management	1.71 to 8.00	5.22	1.43	-.95	.12
Customer focus	1.25 to 7.00	4.96	1.45	-1.11	.49
Total quality	2.44 to 6.89	5.20	1.19	-.88	-.23

Reliability Analysis

Cronbach's alpha ranges from 0 to 1 and measures the underlying reliability of the construct. Most subscales are considered reliable. To determine internal consistency, Cronbach's alpha was calculated for each quality and leadership element or subscale, shown in Table 9. Subscales with the exception of Idealized Influence – Behavior was .60, Intellectual Stimulation was .66, Individualized Consideration was .56, and Management by Exception – Active was .58. All other subscales had Cronbach's alphas greater than .70 and considered reliable. The Cronbach values show that for 14 out of 18 subscales, the results are acceptable.

Table 9
Reliability Analysis: Cronbach's Alpha

Item	# of items	Alpha
Quality Survey		
Quality, Leadership	6	.74
Quality, Information Analysis	4	.80
Quality, Strategic Planning	5	.86
Quality Human Resources	6	.73
Quality Process Management	7	.83
Quality, Customer Focus	4	.77
Quality, Total Quality	1	Cannot be calculated for a scale with only 1 item
MLQ Subscale		
(LIIA) Idealized Influence (Attributed)	4	.83
(LIIB) Idealized Influence (Behavior)	4	.60
(LIM) Inspirational Motivation	4	.81
(LIS) Intellectual Stimulation	4	.66
(LIC) Individualized Consideration	4	.56
(LCR) Contingent Reward	4	.76
(LMEA) Management by Exception (Active)	4	.58
(LMEP) Management by Exception (Passive)	4	.70
(LLF) Laissez-faire Leadership	4	.74
(LEE) Extra Effort	3	.83
(LE) Effectiveness	4	.82
(LS) Satisfaction	2	.78

Assumption Tests

Scatterplots of the data showed no funnel shaped distributions. This tested the assumption of linearity and homoscedasticity. The scatterplots of the predicted values were random. The studentized residuals and associated scatterplots satisfied the assumption of equal variance.

Correlation Analysis

In this study, the Pearson correlation measures the strength of the linear relationship between leadership and quality. The Pearson correlation is shown as “ r ” and can take on values from -1.0 and +1.0. The higher positive r values indicate a higher positive correlation. Conversely, higher negative r values indicate a higher negative correlation. The p value for this test measures the strength of the linear relationship. Values less than .05 suggests there is a significant statistical significance between the leadership and quality. A p value greater than .05 suggests no correlation. The correlation analysis is shown in the Appendix. The data indicated several significant correlations between the quality elements and perceived leadership traits. The significant correlations are described below.

Subscale: Quality Leadership

Quality leadership was moderately associated and positively correlated with transformational leadership including: Idealized Influence, Attributed ($r = .29, p = .01$), Idealized Influence, Behavior ($r = .26, p = .02$), Inspirational Motivation ($r = .24, p = .04$), and Individualized Consideration ($r = .39, p = .00$). Quality leadership was, moderately associated and positively correlated with transactional leadership including:

Contingent Reward ($r = .28, p = .01$) and Management by Exception, Active ($r = .38, p = .00$). Transactional leadership, Management by Exception-Passive ($r = -.05, p = .67$) was slightly negatively correlated, but not associated. Non-transactional leadership, laissez-faire element and quality leadership were moderately associated and negatively correlated ($r = -.24, p = .03$).

Subscale: Quality Information Analysis

Information analysis was moderately associated and positively correlated with transformational leadership including: Idealized Influence, Attributed ($r = .28, p = .01$), Idealized Influence, Behavior ($r = .30, p = .01$), Inspirational Motivation ($r = .24, p = .04$), Intellectual Stimulation ($r = .29, p = .01$), and Individualized Consideration ($r = .32, p = .00$). Information analysis was moderately associated and positively correlated with transactional leadership elements including: Contingent Reward ($r = .27, p = .02$) and Management by Exception, Active ($r = .30, p = .01$). Non-transactional, laissez-faire leadership element and information analysis were slightly negatively, but not correlated ($r = -.06, p = .57$).

Subscale: Quality Strategic Planning

Strategic planning was slightly positive for all transformational elements (Idealized Influence, Attributed, Idealized Influence, Behavior, Inspirational Motivation, Intellectual Stimulation, Individualized Stimulation, and Individualized Consideration), but not significantly correlated. Strategic planning was also slightly positive for Transformational elements (Contingent Reward and Management by Exception, Active), but not significantly correlated. Management by Exception, Passive and non-transactional leadership element (Laissez-faire) was slightly negative but not significantly correlated.

Subscale: Quality Human Resources

Human resources was slightly positive for some transformational elements (Idealized Influence, Attributed; Idealized Influence, Behavior; Inspirational Motivation; and Individualized Consideration), but not significantly correlated. It was positively, moderately associated, and significantly correlated with transformational leadership element, Intellectual stimulation ($r = .25, p = .03$). It was not significantly correlated with transactional or non-transactional leadership elements.

Subscale: Quality Process Management & Quality: Customer Focus

Process management and customer focus were not significantly correlated with transformational, transactional, or non-transactional leadership elements.

Subscale: Quality Total Quality

Total quality was moderately associated and positively correlated with transformational leadership elements: Individualized Consideration ($r = .23, p = .05$) and Intellectual Stimulation ($r = .25, p = .03$). Total quality was moderately associated and positively correlated with transactional leadership subscale, Management by Exception, Active ($r = .25, p = .03$). Non-transactional leadership style and total quality were not significantly correlated. No other subscales from transformational or non-transactional leadership were significantly positively or negatively correlated.

Tests of Hypotheses

Subscale: Quality Leadership

It was predicted that the null hypothesis will be rejected and that there would be a positive relationship between suppliers' transformational leadership style and their quality leadership score.

H1 (null): There is no relationship between a suppliers' transformational leadership style and their perceived "quality leadership" score.

H1 (alternative): There is a positive relationship between a suppliers' transformational leadership style and their perceived "quality leadership" score.

The results shown in Table 10 indicate that one of the transformational leadership subscales was significantly associated to the quality leadership score. Individualized Consideration was positively associated to the leadership score ($B = .46, p < .05$). However, there is no "partial" support; therefore, the first hypothesis H1 was not supported by the data.

Table 10
Regression Results for the Relationship between Transformational Leadership and Perceived Leadership (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Idealized influence (attributed)	.93	2.42	.09	.15	.703
Idealized influence (behavior)	.24	2.40	.02	.01	.922
Inspirational motivation	.16	2.83	.01	.00	.955
Intellectual stimulation	-2.57	2.35	-.19	1.20	.277
Individualized consideration	5.63	2.21	.46	6.50	.013

It was predicted that the null hypothesis will be rejected and that there would be a negative relationship between suppliers' transactional leadership style and their quality leadership score.

H2 (null): There is no relationship between a suppliers' transactional leadership style and their perceived "quality leadership" score.

H2 (alternative): There is a negative relationship between a suppliers' transactional leadership style and their perceived "quality leadership" score.

The results shown in Table 11 indicate that one of the transactional leadership style variables was significantly associated to the leadership score. In particular, Management by Exception (Active) was positively associated to the leadership score ($B = .32, p < .05$). These findings do not support the second hypothesis H2, due to the negative relationship that was predicted between transactional leadership and quality leadership. Thus, the null hypothesis cannot be rejected.

Table 11
Regression Results for the Relationship between Transactional Leadership and Perceived Leadership (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Contingent reward	1.79	1.55	.15	1.33	.252
Management by exception (active)	3.84	1.54	.32	6.20	.015
Management by exception (passive)	-.38	1.34	-.03	.08	.777

Subscale: Quality Information and Analysis

It was predicted that the null hypothesis will be rejected and that there would be a positive relationship between suppliers' transformational leadership style and their information and analysis score.

H3 (null): There is no relationship between transformational leadership and their perceived "quality information and analysis" score.

H3 (alternative): There is a positive relationship between transformational leadership and their perceived "quality information and analysis" score.

The results shown in Table 12 indicate that none of the transformational leadership subscales were significantly associated to the information and analysis score. Thus, the third hypothesis H3 cannot be rejected.

Table 12
Regression Results for the Relationship between Transformational Leadership and Information and Analysis Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Idealized influence (attributed)	.11	.37	.07	.08	.774
Idealized influence (behavior)	.33	.37	.17	.82	.370
Inspirational motivation	-.22	.43	-.12	.27	.607
Intellectual stimulation	.22	.36	.11	.36	.549
Individualized consideration	.29	.34	.16	.77	.385

It was predicted that the null hypothesis will be rejected and that there would be a negative relationship between suppliers' transactional leadership style and their information and analysis score.

H4 (null): There is no relationship between transactional leadership and their perceived "quality information and analysis" score.

H4 (alternative): There is a negative relationship between transactional leadership and their perceived "quality information and analysis" score.

The results shown in Table 13 indicated that the transactional leadership style variables were not significantly associated to the information and analysis score.

Therefore, the fourth hypothesis H4 cannot be rejected.

Table 13
Regression Results for the Relationship between Transactional Leadership and Information and Analysis Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Contingent reward	.34	.23	.20	2.17	.146
Management by exception (active)	.38	.23	.21	2.70	.105
Management by exception (passive)	.16	.20	.09	.59	.447

Subscale: Quality Strategic Planning

It was predicted that the null hypothesis will be rejected and that there would be a positive relationship between suppliers' transformational leadership style and their strategic planning score.

H5 (null): There is no relationship between suppliers' transformational leadership style and their perceived "quality strategic planning" score.

H5 (alternative): There is a positive relationship between suppliers' transformational leadership style and their perceived "quality strategic planning" score.

The results shown in Table 14 indicate that none of the transformational leadership subscales were significantly associated to the strategic planning score. Thus, the fifth hypothesis H5 cannot be rejected.

Table 14
Regression Results for the Relationship between Transformational Leadership and Strategic Planning Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Idealized influence (attributed)	-2.66	4.39	-.14	.37	.547
Idealized influence (behavior)	5.58	4.35	.25	1.65	.204
Inspirational motivation	.77	5.12	.04	.02	.881
Intellectual stimulation	3.41	4.25	.15	.65	.426
Individualized consideration	1.25	4.00	.06	.10	.755

It was predicted that the null hypothesis will be rejected and that there would be a negative relationship between suppliers' transactional leadership style and their strategic planning score.

H6 (null): There is no relationship between suppliers' transactional leadership style and their perceived "quality strategic planning" score.

H6 (alternative): There is a negative relationship between suppliers' transactional leadership style and their perceived "quality strategic planning" score.

The results shown in Table 15 indicated that none of the transactional leadership style variables were significantly associated to the strategic planning score. Therefore, the sixth hypothesis H6 cannot be rejected.

Table 15
Regression Results for the Relationship between Transactional Leadership and Strategic Planning Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Contingent reward	3.43	2.81	.17	1.49	.227
Management by exception (active)	3.45	2.81	.16	1.51	.224
Management by exception (passive)	.07	2.43	.00	.00	.976

Subscale: Quality Human Resource Development and Management

It was predicted that the null hypothesis will be rejected and that there would be a positive relationship between suppliers' transformational leadership style and their human resource development and management score.

H7 (null): There is no relationship between suppliers' transformational leadership style and their perceived "quality human resources development and management" score.

H7 (alternative): There is a positive relationship between suppliers' transformational leadership style and their perceived "quality human resources development and management" score.

The results shown in Table 16 indicate that none of the transformational leadership subscales were significantly associated to the human resource development and management score. Thus, the fifth hypothesis H5 cannot be rejected.

Table 16
Regression Results for the Relationship between Transformational Leadership and Human Resource Development and Management Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Idealized influence (attributed)	2.18	2.88	.18	.57	.45
Idealized influence (behavior)	2.61	2.85	.18	.83	.37
Inspirational motivation	-3.76	3.36	-.26	1.26	.27
Intellectual stimulation	3.21	2.79	.21	1.33	.25
Individualized consideration	.13	2.62	.01	.00	.96

It was predicted that the null hypothesis will be rejected and that there would be a negative relationship between suppliers' transactional leadership style and their human resource development and management score.

H8 (null): There is no relationship between suppliers' transactional leadership style and their perceived quality "human resources development and management" score.

H8 (alternative): There is a negative relationship between suppliers' transactional leadership style and their perceived quality "human resources development and management" score.

The results shown in Table 17 indicated that one of the transactional leadership style variables was marginally associated to the human resource development and management score. Altogether, these findings do not support the hypothesis H8, due to the negative relationship that was predicted between transactional leadership and human resource development and management. Thus, the eighth hypothesis H8 cannot be rejected.

Table 17
Regression Results for the Relationship between Transactional Leadership and Human Resource Development and Management Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Contingent reward	3.10	1.83	.23	2.87	.095
Management by exception (active)	1.92	1.82	.14	1.11	.295
Management by exception (passive)	1.16	1.58	.09	.54	.466

Subscale: Quality Process Management

It was predicted that the null hypothesis will be rejected and that there would be a positive relationship between suppliers' transformational leadership style and their process management score.

H9 (null): There is no relationship between suppliers' transformational leadership style and their perceived "quality process management" score.

H9 (alternative): There is a positive no relationship between suppliers' transformational leadership style and their perceived "quality process management" score.

The results shown in Table 18 indicate that one of the transformational leadership subscales was marginally associated to the process management score. However, there is no "partial" support; therefore, hypothesis H9 was not supported by the data.

Table 18
Regression Results for the Relationship between Transformational Leadership and Process Management Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Idealized influence (attributed)	-.37	3.41	-.03	.01	.913
Idealized influence (behavior)	3.57	3.38	.21	1.12	.294
Inspirational motivation	-5.62	3.98	-.33	2.00	.162
Intellectual stimulation	6.03	3.30	.33	3.34	.073
Individualized consideration	.13	3.11	.01	.00	.966

It was predicted that the null hypothesis will be rejected and that there would be a negative relationship between suppliers' transactional leadership style and their process management score.

H10 (null): There is no relationship between suppliers' transactional leadership style and their perceived "quality process management" score.

H10 (alternative): There is a negative no relationship between suppliers' transactional leadership style and their perceived "quality process management" score.

The results shown in Table 19 indicated that none of the transactional leadership style variables were significantly associated to the process management score. Therefore, hypothesis H10 was not supported by the data.

Table 19
Regression Results for the Relationship between Transactional Leadership and Process Management Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Contingent reward	1.03	2.21	.07	.22	.643
Management by exception (active)	2.89	2.21	.18	1.71	.196
Management by exception (passive)	.82	1.91	.05	.18	.670

Subscale: Quality Customer Focus

It was predicted that the null hypothesis will be rejected and that there would be a positive relationship between suppliers' transformational leadership style and their customer focus score.

H11 (null): There is no relationship between suppliers' transformational leadership style and their perceived "quality customer focus" score.

H11 (alternative): There is a positive between suppliers' transformational leadership style and their perceived "quality customer focus" score.

The results shown in Table 20 indicate that one of the transformational leadership subscales was marginally associated to the customer focus score. Specifically, Intellectual Stimulation was positively associated to the customer satisfaction score. Again, there is no "partial" support; therefore, the eleventh hypothesis H11 was not supported by the data.

Table 20
Regression Results for the Relationship between Transformational Leadership and Customer Focus Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Idealized influence (attributed)	.74	3.22	.06	.05	.818
Idealized influence (behavior)	.14	3.19	.01	.00	.966
Inspirational motivation	-3.94	3.75	-.25	1.10	.2597
Intellectual stimulation	6.01	3.12	.36	3.72	.058
Individualized consideration	-.31	2.93	-.02	.01	.916

It was predicted that the null hypothesis will be rejected and that there would be a negative relationship between suppliers' transactional leadership style and their customer focus score.

H12 (null): There is no relationship between suppliers' transactional leadership style and their perceived "quality customer focus" score.

H12 (alternative): There is a negative no relationship between suppliers' transactional leadership style and their perceived "quality customer focus" score.

The result shown in Table 21 indicated that none of the transactional leadership style variables were significantly associated to the customer focus score. Therefore, the twelfth hypothesis H12 was not supported by the data.

Table 21
Regression Results for the Relationship between Transactional Leadership and Customer Focus Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Contingent reward	1.69	2.10	.12	.65	.423
Management by exception (active)	.20	2.10	.01	.01	.925
Management by exception (passive)	.00	1.82	.00	.00	.998

Subscale: Total Quality Score

It was predicted that the null hypothesis will be rejected and that there would be a positive relationship between suppliers' transformational leadership style and their total quality score.

H13 (null): There is no relationship between suppliers' transformational leadership style and their perceived "total quality" score.

H13 (alternative): There is a positive relationship between suppliers' transformational leadership style and their perceived "total quality" score.

The results shown in Table 22 indicate that none of the transformational leadership subscales were significantly associated to the total quality score. Therefore, hypothesis H13 was not confirmed.

Table 22
Regression Results for the Relationship between Transformational Leadership and Total Quality Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Idealized influence (attributed)	.53	2.87	.04	.03	.854
Idealized influence (behavior)	2.61	2.84	.18	.84	.362
Inspirational motivation	-2.54	3.35	-.17	.58	.451
Intellectual stimulation	3.05	2.78	.20	1.20	.277
Individualized consideration	1.61	2.61	.12	.38	.539

It was predicted that the null hypothesis will be rejected and that there would be a negative relationship between suppliers' transactional leadership style and their total quality score.

H14 (null): There is no relationship between suppliers' transactional leadership style and their perceived "total quality" score.

H14 (alternative): There is a negative relationship between suppliers' transactional leadership style and their perceived "total quality" score.

The results shown in Table 23 indicated that none of the transactional leadership style variables were significantly associated to the total quality score. Therefore, the fourteenth hypothesis H14 was not supported by the data.

Table 23
Regression Results for the Relationship between Transactional Leadership and Total Quality Scores (N = 70)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>F</i>	Sig.
Contingent reward	2.61	1.82	.20	2.05	.158
Management by exception (active)	2.66	1.82	.19	2.13	.149
Management by exception (passive)	.63	1.58	.05	.16	.690

Summary

This chapter described the results of the statistical analysis from the survey data collected. It reviewed of the survey participants and leadership and quality elements or subscales. Following the methods described in Chapter 3, this chapter reviewed descriptive statistics that included: range, mean, standard deviation, skew, and kurtosis. Cronbach's alpha assessed reliability and Pearson correlation examined the correlation between quality and leadership elements. Regression analysis reviewed the relationship between leadership traits and quality elements. The hypothesis questions were not rejected in this study. They were not supported at the .05 significance level. Hypothesis H1, H3, H5, H7, H9, H11, and H13 conclusions were not consistent with a study performed by Hirtz (2002) and Hirtz et al. (2007). Detailed reasons such as sample size, cultural differences associated with the suppliers from United States, Mexico, and China, and the multiple leadership dimensions to each question will be discussed in chapter five. Chapter five also includes a discussion on the implications and recommendations.

CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

This chapter is divided into five sections. The first section is an overview, the second section discusses the findings, the third section discusses the implications, the fourth section discusses the limitations and recommendations for future research, and the fifth section concludes the chapter. The overview will review the study, research question, and possible business applications. The discussion of the findings will review the analysis, selected hypothesis questions and ANOVA results. Limitations and future research are discussed and then finally, concluding remarks for this study.

Overview

This research examined supplier leadership styles and its influence on perceived organizational quality. It used a quantitative, empirical approach to compare perceived leadership traits to multiple quality subscales. The research examined 70 survey responses from companies providing goods or services to the power supply industry. Suppliers were located in the United States, China, and Mexico. Selected participants included middle and senior leaders who were asked to fill out the MLQ leadership and modified MBNQA quality surveys. The research questions asked, “Does suppliers’ perceived transformational or transactional leadership traits result in higher scores for each perceived quality construct? What leadership traits yield a higher total quality score?”

As stated earlier, this research could increase the body of knowledge in supply chain, leadership, and quality management for the power supply industry. Business applications would include development of a robust supplier assessment survey that is

used in the early stages of the supplier qualification. The results could be shared with prospective suppliers providing them insight into their internal leadership capabilities.

Discussion of Findings

This research asked what leadership traits result in the highest quality score. The majority of studies cited in this research showed that leadership played a vital role in effective quality programs (Lemak et. al, 2002). The strong interrelationship between quality system and leadership were prevalent throughout the literature review (Deming, 1982 &1994; Wu, 1996; Savolainen, 2000; Buch, & Rivers, 2001; Hirtz, 2002; Gharneh et al., 2005; G. Calhoun et al. 2007; Hirtz et al., 2007). Numerous references to leadership's role in quality from leading quality experts such as Deming, Crosby, and Juran reveal a long standing theme that leadership, though loosely defined, is critical to organizational success (Hunt, 1992). Conversely, poor leadership results in failed quality initiatives (Krumwiede and Lavelle, 2000; Lemak et al., 2002).

Descriptive statistics showed the mean ranged from one to almost three and a slightly positive skew for the leadership subscales. The quality mean was above five for most subscales and the skew was negative, requiring data transformation. Reliability analysis was performed and Cronbach's alpha was calculated. Most of the leadership quality subscales scored above .70, and were accepted. Correlation analysis for quality leadership, information analysis, and total quality were positively and moderately correlated with transformational leadership subscales. Quality strategic planning was positively and slightly correlated with transformational leadership. Cronbach's alpha and Pearson's correlation analysis agrees with previous research that showed reliable and

positive correlation between transformational leadership and quality. However, when the analysis includes ANOVA the linkages are less compelling.

The continuum of leadership and multidimensional elements contributing to a total quality score created the need for multiple hypotheses questions. These null hypotheses would reveal dissimilarities between the suppliers' transformational and transactional leadership traits and their quality score. Subscales of transformational leadership elements were prevalent in these studies and similar results were predicted in this research for hypothesis: H1, H3, H5, H7, H9, H11, and H13. However, only one transformational subscale for H1, individualized consideration, was positively associated to Quality leadership. As mentioned earlier there is no partial support resulting in a failure to reject the null hypothesis. Similar results for H2, management by exception (active), H9 and H11, intellectual stimulation were positively associated but resulted in a failure to reject the null hypothesis. Thus, the hypothesis questions in this study were not supported at the .05 significance level.

Implications

This study illustrates the challenge small technology companies' face when conventional leadership and quality models are applied to a global supply chain. The categorization of leadership as transformational or transactional proved too complex when applied to diverse suppliers from three culturally unique regions.

Smaller high technology businesses running global supply chains can use this research to guard against prematurely disqualifying prospective suppliers based on one prominent leadership style over another when there is no data in this study to support

such a decision. It also offers insight into the complexity of leadership and quality perceptions from different geographical regions.

Companies should not revert to a standard view or profile of leadership and quality perceptions and should recognize that some leadership traits suitable for one industry are not suitable for another. Thus, a single supplier leadership profile for a global supply chain is not justified based on results from this study. This additional insight adds to the body of knowledge for the power supply industry and can be extended to other high-mix, low volume industries as well.

Limitations and Recommendations for Future Research

This research was narrowly focused on the power supply industry. Research by Hirtz (2002) and Hirtz et al., (2007) had studied, but not extended it to manufacturing industry until this research study. The theoretical framework existed for this research; however, there was no previous research on leadership traits and quality systems for suppliers in the power supply industry. Limitations for this study include: participant's bias answering self-assessment surveys, timing issues of quality improvements attributed to specific leaders, low sample size, and the complexity of categorizing leadership (e.g. transformational and transactional) where there are cultural differences in perceptions of leadership and quality.

Limitations of self-assessments could create self-presentation bias when participants view their individual contributions toward quality or the quality of their company's products as "high" regardless of their organizational leadership. Participants may also accept less than ideal leadership, but still perform their job in a professional

manner, making high quality products. E. Cheng et al. (2006) contended that site visits to suppliers can help to reduce bias.

Conversely, surveys can't capture timing of a leaders' contribution to quality performance that a longitudinal study might reveal (Bush and Rivers, 2001).

Organizations with high turnover in their senior ranks create a timing issue as latent effects of successful or unsuccessful quality initiatives are not evident until the leader leaves the organization. This was outside the scope of this study and economical constraints made a longitudinal study impractical.

Another limitation was sample size. The sample size in this research was potentially too small. This research was limited to the high voltage power supply industry, which is a small subset of the larger, generic power supply industry. The requirements to make high voltage power supplies require an exclusive mix of suppliers, reducing the number of potential participants. Expanding the scope to include similar industries would include additional suppliers, thus increasing the sample size. Future research could include expanding the types of suppliers to a broader market power supply market. This was not considered in this study in an effort to keep the scope narrowly focused and again to stay within economical constraints.

This study did not take into account cultural attitudes toward quality and leadership for this industry. Future research that exclusively examines one geographic region could yield different results when cultural views are consistent across participants. Hanges and Shteynberg (2004) contend that multicultural samples could benefit from aggregating participants into distinctive groups. For example, Chinese views of leadership could have strong cultural influences that are not captured by the MLQ. The

MLQ does not specifically measure distinctive cultural influences such as family, reputation, or social orientation. These elements could influence views on leadership (Davison, Gu, Huang, & Liu, 2008). Further, leaders in Mexico have been traditionally promoted based on their ability to maintain the status quo, act as effective administrators, and make only minor organizational adjustments (Murphy, 2006). These traits have been associated with a transactional leadership style and could have influenced participant's survey responses.

Research that examines other industries that require varying degree of quality might yield different leadership styles. The evolution of leadership and confusion that exists between the two reveals some misconception between leadership and management. Both are often used interchangeably when examining the quality literature. Kotterman asserted that confusion and debate between leadership and management exists in both academic and the workplace (2006). A study that examines this misconception in the context of quality management could further refine future supplier evaluation processes.

Conclusion

It was proposed previously in this study that that the proposed theoretical framework could lead to improved supplier surveys and overall organizational performance. Development of supplier surveys that includes questions to evaluate leadership traits would build on larger supplier evaluation framework. This application would benefit both pre-assessment and ongoing supplier management.

The study evaluated the leadership traits and quality systems of suppliers to the power supply industry. Power supply manufactures are operating in a small niche market that requires culturally diverse suppliers. The purpose was to investigate the specific

leadership traits (transformational, transactional, and non-transactional) that were associated with quality elements (leadership, information analysis, strategic planning, human resources, process management, customer focus, total quality). This study found pair-wise (Pearson's) correlation revealed that both quality leadership and quality information analysis were positively, moderately associated, and significantly correlated with transformational leadership traits and transactional leadership. Total quality was also positively, moderately associated, and significantly correlated with transformational and transactional leadership. ANOVA results for the hypothesis questions in this study were not supported at the .05 significance level. This was inconsistent with previous research on leadership and quality. Before specific questions can be included in supplier surveys questioning transformational leadership traits, leadership linkages between leadership and quality would have to be established.

This study adds to the body of knowledge and contributes to further understanding of leadership subscales and their impact on quality. Pair wise correlation between leadership and quality subscales revealed consistent correlation for the power supply industry that was found in previous studies. However, it showed the value of ANOVA as a more thorough analytical tool when comparing multiple dimensions associated with the subscales. It also revealed that the unique challenge facing this industry where suppliers with unique capabilities are sought out in various geographic regions such as United States, China, and Mexico. Leadership styles are complex with multiple elements that are not easily measured for small, diverse, global supply chains.

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APPENDIX. Pearson's Correlation, Pair Wise Analysis

	QL	QIA	QSP	QHR	QPM	QCF	QTQ	LIIA	LIIB	LIM	LIS	LIC	LCR	LMEA	LMEP	LLF	LEE	LEF	LS	
QL	<i>r</i> --																			
	<i>p</i>																			
QIA	<i>r</i> .49**	--																		
	<i>p</i> .000																			
QSP	<i>r</i> .37**	.76**	--																	
	<i>p</i> .001	.00																		
QHR	<i>r</i> .44**	.80**	.76**	--																
	<i>p</i> .000	.00	.00																	
QPM	<i>r</i> .41**	.83**	.79**	.84**	--															
	<i>p</i> .000	.00	.00	.00																
QCF	<i>r</i> .30**	.65**	.72**	.72**	.79**	--														
	<i>p</i> .01	.00	.00	.00	.00															
QTQ	<i>r</i> .56**	.90**	.89**	.90**	.93**	.84**	--													
	<i>p</i> .00	.00	.00	.00	.00	.00														
LIIA	<i>r</i> .29*	.28*	.13	.21	.04	.04	.18	--												
	<i>p</i> .014	.01	.26	.08	.72	.70	.11													
LIIB	<i>r</i> .26*	.30*	.20	.21	.09	.00	.20	.71**	--											
	<i>p</i> .02	.01	.08	.07	.45	.94	.08	.00												
LIM	<i>r</i> .24*	.24*	.17	.14	-.00	-.02	.14	.81**	.75**	--										

	<i>p</i>	.04	.04	.14	.22	.96	.86	.22	.00	.00										
LIS	<i>r</i>	.19	.29*	.21	.25*	.19	.16	.25*	.70**	.59**	.66**	--								
	<i>p</i>	.11	.01	.07	.03	.11	.16	.03	.000	.000	.000									
LIC	<i>r</i>	.39**	.32**	.16	.20	.09	.07	.23	.72**	.64**	.62**	.67**	--							
	<i>p</i>	.001	.00	.18	.09	.43	.54	.05	.000	.000	.000	.000								
LCR	<i>r</i>	.28*	.27*	.16	.23	.08	.07	.20	.81**	.77**	.74**	.69**	.69**	--						
	<i>p</i>	.01	.02	.17	.05	.47	.55	.08	.000	.000	.000	.000	.000							
LMEA	<i>r</i>	.38**	.30*	.20	.22	.19	.06	.25*	.35**	.43**	.31**	.37**	.49**	.45**	--					
	<i>p</i>	.00	.01	.08	.06	.11	.61	.03	.00	.00	.00	.00	.00	.00						
LMEP	<i>r</i>	-.05	.03	-.01	.02	.04	-.00	.00	-.30*	-.18	-.21	-.34**	-.27*	-.27*	-.01	--				
	<i>p</i>	.67	.78	.89	.83	.73	.95	.95	.01	.13	.07	.00	.02	.02	.88					
LLF	<i>r</i>	-.24*	-.06	-.01	.04	.05	.03	-.02	-.44**	-.24*	-.38**	-.35**	-.36**	-.37**	.046	.60**	--			
	<i>p</i>	.03	.57	.90	.68	.65	.78	.83	.00	.03	.00	.00	.00	.00	.70	.00				
LEE	<i>r</i>	.21	.14	.05	.08	-.00	.02	.09	.80**	.58**	.68**	.76**	.70**	.66**	.30*	-.39**	-.42**	--		
	<i>p</i>	.07	.23	.63	.47	.96	.84	.44	.00	.00	.00	.00	.00	.00	.01	.00	.00			
LEF	<i>r</i>	.40*	.37**	.29*	.22	.17	.14	.30*	.79**	.63**	.72**	.73**	.73**	.70**	.46**	-.30*	-.39*	.76**	--	
	<i>p</i>	.00	.00	.01	.05	.160	.23	.00	.000	.000	.00	.000	.000	.00	.00	.01	.00	.00		
LS	<i>r</i>	.32**	.28*	.19	.17	.09	.04	.21	.78**	.58**	.66**	.77**	.71**	.67**	.38**	-.42**	-.49*	.84**	.80**	--
	<i>p</i>	.00	.01	.10	.14	.42	.71	.08	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	

Pearson's Correlation, pair wise analysis (N = 70).

Note. ** indicates a correlation significant at the .01 level (2-tailed); * indicates a correlation is significant at the .05 level (2-tailed).