

EASTERN UNIVERSITY

**SERVANT LEADERSHIP BEHAVIORS OF AEROSPACE AND  
DEFENSE PROJECT MANAGERS AND THEIR RELATION TO  
PROJECT SUCCESS**

by

MICHAEL T. DOMINIK

A dissertation submitted to the

Campolo College of Graduate and Professional Studies

in partial fulfillment of the requirements

for the degree Doctor of Philosophy

St. Davids, Pennsylvania

May 2013

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Anthony Blair, Ph.D., D.Min., Committee Chair

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Faith Ngunjiri, Ed.D., Committee Member

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Michael Roberts, Ph.D., Committee Member

---

Debra Heath-Thornton Ed.D., Executive Dean

## ABSTRACT

### SERVANT LEADERSHIP BEHAVIORS OF AEROSPACE AND DEFENSE PROJECT MANAGERS AND THEIR RELATION TO PROJECT SUCCESS

Michael T. Dominik

Doctor of Philosophy, 2013

Eastern University

Advisor: Anthony Blair, Ph.D., D.Min.

The success of a project is dependent in part on the skills, knowledge, and behavior of its leader, the project manager. Despite advances in project manager certifications and professional development, the aerospace and defense industry has continued to see highly visible and expensive project failures partially attributable to failures in leadership. Servant leadership is an emerging leadership theory whose practitioners embrace empowerment, authenticity, humility, accountability, forgiveness, courage, standing back, and stewardship, but has not yet been fully examined in the context of the project manager as leader. The objective of this study was to examine the relationship between servant leadership behaviors demonstrated by aerospace and defense project managers and the resulting success of their projects. Study participants were drawn from aerospace and defense oriented affinity groups from the LinkedIn® social media web system. The participants rated their project managers using a 30-item servant leadership scale, and rated the success of their project using a 12-item project success scale. One hundred and fifteen valid responses were analyzed from 231 collected samples from persons who had worked for a project manager on an aerospace and

defense project within the past year. The results of the study demonstrated statistically significant levels of positive correlation to project success for all eight servant leadership factors independently evaluated. Using multiple linear regression methods, the servant leadership factors of empowerment and authenticity were determined to be substantial and statistically significant predictors of project success. The study results established the potential application of servant leadership as a valid approach for improving outcomes of projects.

## **Dedication and Acknowledgments**

My wife Kathy Ann has been my number one supporter and cheerleader in all of my academic endeavors throughout our nearly thirty years of marriage. Through multiple degree pursuits, she sacrificed time, energy, attention, and resources in order to allow me to achieve what is gratifying to me. I owe everything for her unselfish love and dedication to our beautiful marriage and life together. Our savior the Lord Jesus Christ has been an instrumental part of my academic journey at Eastern University. I believe that I was guided by God to Eastern University, in order that my faith would be reinvigorated in magnificent ways never anticipated. Faith in our Lord has seen our family through difficult health trials, and our dedication to Him has increased multi-fold during these five years of dissertation study and research. To Him, Kathy Ann and I owe and dedicate everything in our lives, because without Him we are nothing. I dedicate this work to our children, Matthew and Kirsten, who too have sacrificed a great deal for me to pursue my educational aspirations. You are the joy of our lives, and we hope we have given you a good example and inspiration for dedication and persistence in all of your life's endeavors. My committee chair, Dr. Tony Blair, has been instrumental in my doctoral education since its first day, and his caring, encouragement, and support made possible the completion of this work. My committee member Dr. Faith Ngunjiri has encouraged and motivated me to look deeper and wider at all of my work, guided me in servant leadership examination, and brought the perspective of a wise African woman to my undertaking. Dr. Mike Roberts has given me sound advice and support in the methodological design of this research and analysis of its results. Inspiration for the topic of servant leadership came from my dear departed aunt, Sister Mary Virginia, Little

Servant Sisters of the Immaculate Conception, who was a shining example of the servant leader, and who inspired me to live a better life as one who helps others through service. Finally, and most foundationally in my life, I dedicate this accomplishment to my mother Anne and departed father Martin, who always encouraged me toward education and academic pursuit, and who planted in me the seeds of love for the pursuit of knowledge.



## Table of Contents

<b>ABSTRACT</b> .....	<b>4</b>
<b>Dedication and Acknowledgments</b> .....	<b>6</b>
<b>CHAPTER 1</b> .....	<b>13</b>
<b>BACKGROUND AND PURPOSE OF THE STUDY</b> .....	<b>13</b>
Statement of the Problem .....	17
Purpose of the Study .....	18
Research Question.....	18
Significance of the Study .....	19
Definitions.....	20
Limitations .....	21
<b>REVIEW OF RELATED LITERATURE</b> .....	<b>23</b>
Purpose .....	23
Leadership .....	23
Servant Leadership.....	33
Servant Leadership Theoretical Constructs and Scales.....	40
Leadership in Project Management.....	49
Project Success: Definitions, Factors, and Scales.....	59
Servant Leadership in Project Management.....	61
<b>Rationale for servant leadership in project management</b> .....	<b>65</b>
Summary .....	70
<b>CHAPTER 3</b> .....	<b>72</b>

<b>RESEARCH METHODS.....</b>	<b>72</b>
Purpose .....	72
Research Question.....	72
Null Hypotheses .....	73
Instrumentation.....	75
Project Implementation Profile (PIP) .....	76
Servant Leadership Survey (SLS) .....	77
Population and Sample.....	78
<b>Access to the sample population .....</b>	<b>81</b>
Procedure.....	83
Data collection.....	86
<b>CHAPTER 4.....</b>	<b>88</b>
<b>ANALYSIS .....</b>	<b>88</b>
Data analysis .....	90
<b>CHAPTER 5.....</b>	<b>115</b>
<b>References.....</b>	<b>131</b>
<b>Appendices.....</b>	<b>155</b>
APPENDIX A: Permission to use Survey Instruments.....	155
APPENDIX B: Servant Leadership Survey (SLS) .....	157
APPENDIX C: Project Implementation Profile (PIP) .....	158
APPENDIX D: Survey Solicitation .....	159
APPENDIX E: Survey .....	160
APPENDIX F: Informed Consent.....	165

## List of Tables

Table 3.1 <i>LinkedIn® groups forming the target population</i> .....	85
Table 4.1 <i>LinkedIn® Source of Responses</i> .....	89
Table 4.2 <i>Distribution of Response Validity</i> .....	89
Table 4.3 <i>Independent Variables from the SLS</i> .....	91
Table 4.4 <i>Organizational level reported by valid respondents</i> .....	93
Table 4.5 <i>Highest academic degree reported by valid respondents</i> .....	94
Table 4.6 <i>Type of college degree reported by valid respondents (multiple responses allowed)</i> .....	95
Table 4.7 <i>Years of professional experience reported by valid respondents</i> .....	96
Table 4.8 <i>Types of projects reported by valid respondents (multiple responses allowed)</i> .....	97
Table 4.9 <i>Period of time having worked with evaluated project manager</i> .....	98
Table 4.10 <i>Descriptive statistics for PIP scores from valid respondents (all projects, frequency distribution)</i> .....	99
Table 4.11 <i>Descriptive statistics for summary PIP scores from valid respondents (all projects, summary basis)</i> .....	99
Table 4.12 <i>Descriptive statistics for SLS scores from valid respondents (n=115) (by factor, normalized high to low, summary for all valid respondents)</i> .....	101
Table 4.13 <i>Pearson product-moment correlations between the eight factors of servant leadership behavior and project success</i> .....	109
Table 4.14 <i>Coefficient of determination results for the eight factors of servant leadership behavior in explaining variance in project success (rank order, high to low)</i> .....	109

Table 4.15 *Variance inflation factor (VIF) and tolerance values for independent variables (rank order, high to low VIF) .....110*

Table 4.16 *Standardized coefficient beta values and significance for SPS variables (absolute beta value rank order, high to low) .....113*

## List of Figures

Figure 1 Venn diagram of the conceptual framework.....	19
Figure 4.1 Normal probability plot of the regression standardized residual....	111
Figure 4.2 Scatterplot of the regression standardized residual.....	111

## CHAPTER 1

### BACKGROUND AND PURPOSE OF THE STUDY

The failure of important aerospace and defense projects, some with highly visible organizational and societal consequences, have attracted attention from media, citizenry, and public investigators. Among these failed projects are the 1999 Mars Climate Orbiter spacecraft loss of radio communication and subsequent disintegration, the 2003 Space Shuttle Columbia disintegration that resulted in the tragic loss of seven astronauts, and the 2006 U.S. Coast Guard Maritime Patrol Boat project that grounded eight patrol boats. Subsequent investigations into and studies of these projects revealed failures by project managers who lacked principled, people-centered leadership, as evidenced by failures to encourage, care, or listen to followers (Columbia Accident Investigation Board, 2003; Standish Group International, 1995); misfit of the project type with the adopted project management approach (Sausser, Reilly, & Shenhar, 2009); and a lack of clear leader-follower accountability (Brown, Potoski, & VanSlyke, 2008; U.S. Department of Homeland Security, 2007). In an increasingly complex technological world where success or failure can have significant organizational implications (Cooke-Davies, 2002), organizations need not only more competent and capable project management, but also superior leadership exercised by those with courageous character and willing accountability to meet complex organizational challenges (Ferraro, 2008; Smyrk, 2008). The old model of the leader operating within a bureaucratic and hierarchical chain of command, concerned primarily with satisfying the interests of the primary stakeholders “above” is evolving to toward the ethical and virtuous leader who embraces service to

others, long-term societal responsibility, and focus on followers (Van Dierendonck & Patterson, 2010). This is the model of the servant leader.

Adoption of the servant leadership model is one approach to resolving project manager leadership shortcomings that can lead to project failures. Servant leaders guide their followers with an approach that promotes empowerment and accountability, with leadership grounded in courage, visionary stewardship, authenticity, and humility. Leadership which exemplifies such qualities and behavior can be beneficial for follower performance (Van Dierendonck & Nuijten, 2011) and, therefore, beneficial for project outcomes. Servant leadership offers project managers an opportunity to build the foundational moral authority essential when issues and challenges arise, and when project followers whose assignment is temporary may question the leadership of the project manager. Servant leaders value the interests of their followers before their own, promote accountability, and empower followers through use of stewardship rather than control. Practice of a servant leadership style may help capable project managers avoid some of the pitfalls that led to the highly visible failures mentioned earlier.

### **Leadership matters in project management**

The role, function, and importance of leadership within the project management context has been the subject of increasing attention by global researchers and industry groups in recent years (Anantatmula, 2010; Geoghegan & Dulewicz, 2008; Keller, 2008; Muller & Turner, 2010; Nixon, Harrington, & Parker, 2012; Project Management Institute [PMI], 2008; Standish Group International, 2001; Turner & Muller, 2005). Moving beyond the technological or managerial competencies of project managers, researchers have shown the project manager, as leader, to be essential to project success

(Amason et al., 2007; Hartman & Ashrafi, 2002; Hauschildt, Gesche, & Medcof, 2000; Standish Group International, 2001; Thoms & Pinto, 1999; Turner & Muller, 2005).

While leaders have been studied in many contexts (for instance, in politics, business, military, and religion), the study of leadership within project management has only emerged as a field of academic research in the past forty years (Cooke-Davies, 2002), and further study of complex project leadership is required (Muller, Geraldi & Turner, 2011).

Understanding why a project environment differs from the typical organizational structure is essential to understanding its unique leadership needs. A project is “a temporary undertaking to produce a unique output subject to limitations such as time, people, and other resources” (Kloppenborg, Shriberg, & Venkatraman, 2003, p.11).

Projects have occurred throughout history, whether to build the great pyramids or to wage war, and they require project management, which is “the application of knowledge, skills, tools, and techniques to project activities to meet project requirements” (PMI, 2008, p.6).

Responsibility for a project falls to such managers, who, like their project, may be temporary, assigned often for only a portion of or phase of the project (Turner & Muller, 2005), yet no one person is more important than the project manager to the success of the project (Pinto, Thoms, Trailer, Palmer, & Govekar, 1998). The project manager “is the person assigned by the performing organization to achieve the project objectives” (Project Management Institute, 2008, p.13) who operates as the project leader. Successful project management depends on project managers who are skilled at guiding the completion of tasks to be accomplished by project team members. In the projectized organization, however, project team members do not report administratively to project managers. Project managers therefore “often must get things done through the power of



influence since his or her formal power may be limited” (Kloppenborg, 2009, p.16). This authority gap has been noted for decades in project management studies (Sotiriou & Wittmer, 2001; Thamhain & Gemmill, 1974).

Because project teams are often multifunctional and even multi-organizational in composition (Ammeter & Dukerich, 2002; Pinto & Trailer, 1998), traditional leadership authority processes and techniques such as chain of command and performance review controls are non-existent or not effective (Thamhain, 2008); this condition further underscores the utility and importance of leadership as opposed to traditional management (Igason & Jonasson, 2009). Project leaders work in an organizational paradox with full responsibility but limited control and authority (Turner & Muller, 2006), where hierarchical organization structures and associated leadership are seldom effective (Thamhain, 2008). Because projects are temporary, the project team members do not functionally report to the project manager; instead, they report to functional managers, or department heads, who are the ongoing non-temporary managers of the organization. The project manager does not conduct team members’ performance review, does not decide on their promotions, does not determine their compensation, and does not control their career path. The project manager, however, has responsibility for the successful outcome of the project, without full authority or control over the team member personnel. Such circumstances remove traditional employee incentives such as compensation, promotion, or future work assignments (Thamhain & Gemmill, 1974).

Problems in leader-follower relationships and leader behavior reported in failed projects justifies continued effort to seek new and innovative leadership styles in order to address these issues and thereby strive to improve the probability of successful project

outcomes (Muller, Geraldi & Turner, 2011). Due to these challenges, practitioners and scholars of project leadership would do well to consider the admonitions of Pinto, Thoms, Trailer, Palmer, & Govekar (1998) who suggested that “any project manager’s ability to lead effectively is augmented by his understanding of alternative approaches to leadership” (p.29). As such, organizations and project managers are wise to consider alternatives such as the servant leadership style.

### **Statement of the Problem**

Despite the emergence of professional competency credentials and standardization in methods (Milosevic & Patanakul, 2004; PMI, 2002), projects continue to fail at an alarming rate (Hass, 2009; Nieto-Rodriguez & Evrard, 2004). Annual project failure rates ranged from 18% to 40% annually during the period of 1994-2006 (Standish Group International, 1995, 1999, 2001, 2009). Among U.S. government-sponsored technology projects, one of the principal attributions of failure are shortcomings in leadership by project managers (Sausser, Reilly, & Shenhar, 2009; United States Government Accountability Office, 2010).

Technologically complex projects, such as those found in aerospace and defense contexts, often involve significant risk and high failure rates (Cicmil, Hodgson, Lindgren, & Packendorff, 2009; Kloppenborg, Shriberg & Venkatraman, 2003; Milosevic & Patanakul, 2005; Nieto-Rodriguez & Evrard, 2004; Sausser, Reilly, & Shenhar, 2009; Standish Group International, 2009). Extensive investigation by U.S federal agencies of highly publicized failed projects under their purview have attributed some of reasons for these failures to project leadership, and reported shortcomings such as a lack of encouragement, caring, or listening by leaders, or the failure of leaders to embrace their

proper duties, roles and responsibilities, or to hold themselves or others accountable (Brown, Potoski & VanSlyke, 2008; Columbia Accident Investigation Board, 2003; U. S. Bureau of Ocean Energy Management, 2011; U.S. Department of Homeland Security, 2007). Multi-organizational project leadership complications were evident in the failures associated with the space shuttle Columbia, Mars Observer, and Patrol Boat projects, which employed what would be considered complex organizational designs (Kerzner & Belack, 2010) that demanded leadership based on collaboration and teamwork rather than leadership based on traditional command and control (Hass, 2009).

### **Purpose of the Study**

The purpose of the present study is to explore and analyze the relationship of servant leadership and project success for managers of aerospace and defense projects. Because the attributes of the servant leadership style may provide more effective qualities leading to project success, this quantitative study examined the servant leadership behaviors of aerospace and defense project managers, as seen by their project subordinates and the success of their associated project, where the independent variable is a measure of servant leadership, and the dependent variable is a measure of project success. The results of this study examined whether demonstration of servant leadership behaviors by aerospace and defense project managers can contribute positively to the success of a project.

### **Research Question**

This study was guided by the principal research question to be investigated: What is the relationship between servant leadership behaviors demonstrated by aerospace and defense project managers and the resulting success of their projects?

The research question considered if a project manager, in leadership role on an aerospace and defense project, exhibited the behaviors of a servant leader, and did that behavior relate positively, negatively, or not at all upon the success of their project.

Within the principal theoretical constructs of leadership and project management, the present study explored the intersection of three subsets of research and literature – servant leadership, project leadership, and project success (Figure 1).

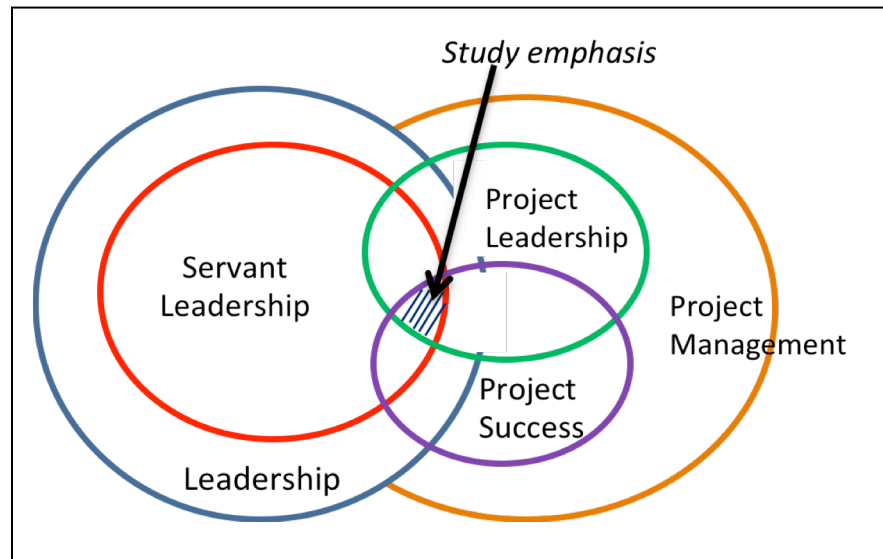


Figure 1. Venn diagram depicting the conceptual framework of the study as a subset of leadership and project management constructs with emphasis on the intersection of servant leadership, project leadership, and project success

### Significance of the Study

The literature for both servant leadership and project management is extensive and global, but not intermingled. The servant leadership literature in premier research and academic publications has not yet addressed project managers as organizational leaders, nor is there any research literature published in peer-reviewed project management journals applying servant leadership to the project management context. The topic has been addressed in only a handful of non-peer reviewed publications (White,

2004, Ferraro, 2008; Lichtenwalner, 2009; Thompson, 2010). This gap in the literature has denied aerospace and defense project managers and related researchers the opportunity to examine servant leadership as an effective leadership alternative in addressing their ongoing project failure challenges. In particular, servant leadership offers authenticity to offset issues related to trust, empowerment to compensate for shortcomings in true responsibility, and stewardship to provide confidence that the interests of the public are being considered.

The present study is an opportunity to begin to close the gap in the literature. In contrast to classical leadership theories (i.e., transformational, transactional, and situational), leadership scholars have identified servant leadership as a superior moral and ethical approach that prioritizes the needs and interests of followers, rather than focusing only on the interests of the organization. Project managers, as leaders, may discover in servant leadership a means by which high-quality relationship with followers may be developed which, in turn, can inspire higher levels of performance, yielding positive project outcomes.

### **Definitions**

*Project:* A temporary endeavor undertaken to create a unique product, service or result (PMI, 2008).

*Project management:* The application of knowledge, skills, tools, and techniques to project activities to meet project requirements (PMI, 2008).

*Project manager:* The individual(s) assigned to achieve all or some part of the project objectives (PMI, 2008).

*Project success:* Creation of deliverables that include all of the agreed upon features, that pleases the project's customers, and is completed on schedule and on budget (Kloppenborg, 2009) including customer acceptance (Kerzner, 2000).

*Project team:* Persons with assigned roles and responsibilities for completing a project (PMI, 2008, p.215)

*Project team member:* Persons assigned to work on a project, often as part of a project team, and who do not report administratively to the project manager.

*Servant leader:* The person who exhibits through their behaviors the qualities and characteristics of servant leadership, especially as defined by Greenleaf (1977), Spears (1995), or Van Dierendonck and Nuijten (2011). Servant leaders engage people as whole individuals with heart, mind, and spirit (Van Dierendonck & Patterson, 2010).

*Servant leadership:* A leadership style that is characterized as service-oriented, moral-laden, and follower-centric (Sendjaya & Sarros, 2002; Stone, Russell, & Patterson, 2004), and associated with more satisfied, more committed, and better performing employees (Van Dierendonck & Patterson, 2010).

### **Limitations**

The study has a number of limitations, including common items such as obtaining an adequate sample size, a representative sample, limitation posed by the validity and reliability of the instruments used, as well as the following specific items:

1. It studied only project managers who have led an aerospace and defense project and who are associated with the selected sample, which represents only a small portion of the global project manager population.

2. It examined only the relationships between the servant leadership behaviors of aerospace and defense project managers and project success, while there may be other confounding variables that influence project success.
3. It utilized only project team members as a single rater for each aerospace and defense project manager.

## CHAPTER 2

### REVIEW OF RELATED LITERATURE

#### Purpose

This review of the literature serves as a synthesis of the two principal themes of servant leadership and project leadership, with the further integration of project success. The review provides an interaction of classical and contemporary leadership theories, each contrasted with servant leadership, followed by an examination of servant leadership theory. Development of servant leadership models and scales is then explored, and provides a rationalization for the selection of scales for the present study. The review next examines the project management literature as it considers the factors of project leadership, and closes with a review of selected literature for the definition and measurement of project success.

#### Leadership

There are as many definitions of leadership as researchers with a point of view (Yukl, 2002), with an increasing multitude of theoretical constructs. Prior to the latter half of the twentieth century, leadership discourse was dominated by sociologists, especially those who studied and wrote about leaders in the political arena (Guillen, 2010). Burns' prominent publication *Leadership* (1978) continued that emphasis on leadership of the body politic while pointing out how little we really know about leadership; he also carried forth the influential concept of transformational leadership. "Leadership," stated Burns (p.2) "is one of the most observed and least understood phenomena on earth."



A common thread throughout the leadership literature is the premise that leadership exists in terms of the relationship between leaders and those being led. In this view, leader-follower relationships are based on influence (Rost, 1991; Northouse, 2007) which can be bi-directional, are mutually purposeful (Rost, 1991), are goal-oriented and involve the use of power (Burns, 1978). Because decisions made in the leader-follower relationship have implications and consequences for others and the organization as a whole, an underlying ethical question is, whose interests are being served? Whose interests have priority -- those of the leader, the follower, the organization, or society? Viewing this question through the lens of those with less power in the relationship brings followers' needs into focus. Wren (2006), quoting Price (2005), who has examined ethical failures in leadership, understood this question as having roots in the human condition: "What is there about the human condition that makes us [the followers] need leadership?" (Wren, 2006, p.18).

Because this study examines the behavior of leaders using a servant leadership theoretical construct with a strong moral component (Graham, 1991) that places specific emphasis on the needs of followers (Patterson, 2003), exploring leadership theories from the follower's viewpoint is the focus of this review of the leadership literature. Brief consideration has also been given to way in which each theory relates to servant leadership and to project management.

Until the mid-twentieth century, leadership study focused primarily on trait theory, which understood leadership as an intrinsic trait which was believed to be a factor accounting for and describe the differences between leaders and followers. While trait theory focuses exclusively on the leader, with no accounting for the views or perceptions

of followers, social scientists and researchers sought correlations between the personal traits of leaders and the influence of that behavior on followers. However, these studies were unable to identify a unified list of key leader traits. A major review of the literature conducted by Stogdill (1948) rejected the hypothesis that leaders have different traits from non-leaders, concluding that no consistent set of traits exists which distinguishes leaders from followers. Stogdill's research exposed the "great man" trait-based theory of leadership to be insufficient in defining leadership (Zaccaro, 2007).

New approaches to leadership research subsequently emerged that focused on leadership behaviors and situations, and leadership came to be recognized as a relationship *between* people in a social situation (Stogdill, 1948). Study of leader traits was not entirely discarded, as Stogdill's later research (1974) analyzed 163 new studies and validated the argument that personal characteristics are a part of effective leadership (Northouse, 2007). Building on this resurrected validity, it is possible that some behavioral elements of trait theory (though not purely biological) may still be embedded within some currently valid leadership measures, because traits are still recognized as important components of how leaders are perceived by followers. For instance, the servant leadership scale (Van Dierendonck & Nuijten, 2011) includes five statements which measure a factor identified as "humility," and two items that assess a factor identified as "courage." These factors of a contemporary measure may in part be interpreted as part of the leader's personality traits.

Project management research also entered into the study of leadership traits. Gehring (2007) investigated traits theory as applied to project management, transposing the concept of personality traits into critical project manager competencies as defined by

the Project Manager Competency Development (PMCD) Framework (PMI, 2002). Conducting a literature review as well as conducting a small sample size survey, 53 self-raters expressed preferences for project manager traits using the 16-item Meyers-Briggs scale. The study concluded that effective project leadership competencies can be supported by certain personality traits (p. 120). However, none of the six units of PMCD competencies are generally supportive of servant leadership qualities. For instance, the PMCD instead endorses “a desire to lead others” (p.113), which stands in direct contrast to the servant leadership principle of seeking to serve others (Greenleaf, 1977). These differences underscore the rationale of the present study to contribute to the literature by evaluating project leaders using a valid servant leadership construct.

Follower consideration is an integral part of transformational leadership theory, as initially defined by Burns (1978) and extended by Bass (1985). The transformational leadership approach seeks follower development through individualized consideration, intellectual stimulation, inspirational motivation, and idealized influence, while seeking to inspire the follower to receive and embrace the leader’s message. “That people can be lifted *into* their better selves is the secret of transforming leadership” concluded Burns (p.462). By striving to enable followers to reach their full potential, transformational leadership theory can be viewed as complementary to servant leadership, and aligns well with its factor of empowerment (Van Dierendonck & Nuijten, 2011).

There are also significant differences, however, particularly in regard to utility and satisfaction of interests. Graham (1991) suggests that for transformational leaders, the organization’s interests are the primary concern, not those of the follower. The value of developing the follower is to realize the goals of the leader or the organization, and is

not benevolently utilized for the principal benefit of the follower. An empirical study of these differences (Parolini, Patterson, & Winston, 2009) surveyed more than 500 respondents working in various types of organizations, and measured several distinctions between the two theories, including motive, focus, morals (also claimed by Graham, 1991), development, and influence. Using discriminant analysis, the study confirmed that servant leaders were differentiated from transformational leaders by their allegiance to the individual, and not toward the organization.

In considering servant leadership theory, there are additional behavioral differences separating it from transformational theory and its offshoots such as charismatic leadership. House (1976) had introduced the theory of charismatic leadership, which was linked to transformational leadership by Bass (1985). Bass's (1985) definition of transformational leadership included charisma, inspirational motivation, intellectual stimulation, and individualized consideration (pp. 5–6). Charisma as defined by House (1976) included being dominant, and therefore has little place in the servant leader's character, where instead humility is more prominent. Even so, charismatic leadership as a style may have a place in certain situations and cultures. Another perspective on transformational leadership comes from Kouzes and Posner (1998, 2007), where encouraging the heart of the follower and inspiring a shared vision are among the core elements of exemplary leadership. Kouzes and Posner also recognize love as an internal motivator that is a best-kept secret of successful leaders, a theme which aligns with some definitions of servant leadership.

Among the studies of transformational leadership in the project management context is one involving 300 Taiwanese companies (Wang, Chou, & Jiang, 2005) which

supported the hypothesis that charismatic leadership positively influenced team performance for an information systems project. Endorsement of transformational leadership for use by project managers came from a team of academic researchers (Pinto, Thoms, Trailer, Palmer, & Govekar, 1998) who strongly promoted it as a very appropriate leadership style for successful project managers (p.6). Further bolstering the argument for the use of transformational leadership styles in projects, Dulewicz and Higgs (2004) tested a newly developed leadership instrument, the Leadership Dimensions Questionnaire (LDQ), and found preferences for transformational leadership in complex projects involving organizational change. There are sufficient differences between transformational, charismatic, and servant leadership theories to support the merit of this study exploring the unique relationship between project manager servant leadership behaviors and project success.

The intersection of leadership and ethics has a long history (e.g. Plato, Aristotle), though leadership scholars have engaged the topic only recently. Burns (1978) included morals and the common good at the core of his transformational leadership theory; Rost (1991) extended this thinking to contend that ethical leaders are those concerned with the broader community as a civic virtue. Heifetz (1994) further declared that leadership cannot be value-free, asserting that “we have to take sides” (p.14), and intending to derive an ethical foundation as essential for leadership activity. Ciulla (1998, 2003) explored more deeply the convergence of business ethics with leadership, and attempted to further “map the territory” (1998, p.3). Kanungo & Mendonca (2006) further underscored the moral obligation. But even as academic interest in ethical leadership escalates, theoretical definitions are still emerging.

Ethical leadership as defined by Brown, Trevino, and Harrison (2005) is primarily a normative behavior perspective which is not directed solely at either followers or leaders. Ethical leaders are honest, caring, and principled, communicate frequently, set clear ethical standards, and practice what they preach as role models (Brown & Trevino, 2006). Measurement of ethical leadership has been proposed using the Ethical Leadership Scale (Brown, Trevino, & Harrison, 2005), a single factor, 10-item scale that is simpler than most servant leadership measurement scales. Ethical leadership does share several factors with servant leadership, including concern for people, while also focusing on serving the good of the whole. As a theory, ethical leadership has not been examined among project managers, but the underlying elements of ethical behavior permeate project manager leadership studies. For instance, project management research has shown that team members need to believe in the ethical character of their leaders (Sotiriou & Wittmer, 2001).

The dyadic interaction between the leader and follower informs authentic leadership theory. Luthans and Avolio (2003) initially defined authentic leadership in organizations “as a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviors on the part of leaders and associates, fostering positive self-development” (p. 243). Variations of this model were advanced by Gardner, Avolio, Luthans, May, and Walumbwa (2005), who considered followers to be a key focal point in the building of authentic leadership models. The research by Walumbwa, Avolio, Gardner, Wernsing, and Peterson (2008) used both U.S. and international samples to validate their Authentic Leadership Questionnaire (ALQ), a higher order,

multidimensional theory-based instrument to measure authentic leadership. In offering preliminary evidence for the ALQ construct validity, the researchers proved that the four-factor authentic leadership concept could predict selected organizational outcomes distinct from the well-known theories of ethical and transformational leadership. The authentic leadership model has several overlaps with servant leadership, most evidently the factors of authenticity and humility, along with an emphasis on followers. Authentic leadership theory is sufficiently new to have not yet been investigated within the project management context.

A tendency toward reaction rather than vision classifies the transactional leader, who is unconcerned with the individualized needs or development of followers (Northouse, 2007). Transactional leaders are not interested in followers' inspirations or aspirations, and tend to rely upon incentives or punishment as a means of performance management to accomplish organizational goals. In contrast to transformational leadership, transactional leadership is based on an exchange of things of value between leaders and followers in order to achieve follower compliance (Yukl, 2006).

Transactional leaders can be influential primarily because it is in the best interests of followers to be influenced, lest they suffer negative consequences for non-compliance. Transactional leadership theory involves two aspects: contingent reward and management-by-exception (MBE) (Bass & Avolio, 1994). Contingent reward is incentive-based, and seeks effort from followers in exchange for specified rewards from the leader. An example is the understanding between manager and employee regarding salary or promotion actions for a certain level of performance. MBE is based on corrective criticism and negative feedback and reinforcement (Northouse, 2007). In the

project manager's context, transactional leaders are seen as good administrators operating as problem solvers (Pinto, Thoms, Trailer, Palmer, & Govekar, 1998). Turner and Muller (2006) subsequently found that a transactional style is preferable in simple, engineering projects (p.9).

The dyadic relationship between follower and leader is explicit in the leader-member exchange (LMX) theory (Dansereau, Graen, & Haga, 1975; Graen & Uhl-Bien, 1995). In many leadership situations, the same leader treats individual followers differently, which often results in varying dyadic relationships creating two groups of followers—an in-group and an out-group. While high-quality exchanges can develop, the basis for such high-exchange relationship can reflect the transactional environment itself, including rewards of pay increases and desirable assignments, among others. Because the project manager does not typically hold such transactional influence, this theory remains unexamined in this context. Other than sharing concern for followers, LMX theory has little in common with servant leadership theory.

Among contingency theories of leadership, the situational leadership approach (Hersey & Blanchard, 1993) supports the notion that the leader's best course of action depends upon awareness of the follower's competence, commitment, and level of development; the four general styles are delegating, supporting, coaching, and directing. This theory is not well supported in research (Yukl, 2006), with light examination in the project management context (Lee, 2010). Because it is highly prescriptive, that is, it tells the leader what to do and not do in specific situations, it is popular in organizational leadership development programs (Hersey & Blanchard, 1993). Situational leadership competencies may correlate with project success in specific circumstances, such as fixed-



price contracts or high complexity in projects (Muller & Turner, 2007, 2010). The least preferred coworker contingency model (Fiedler, 1967, 1971, 1972) is predictive in nature, with the most recent model (Fiedler, 1978) allowing the leader to self-evaluate, increase their self-awareness, and recognize whether they prefer close interpersonal relationships (high least preferred coworker (LPC) score) or are motivated by achieving task objectives (low LPC score). The path-goal theory of leadership (House, 1971) is based on an expectancy theory of motivation, namely, the likelihood of task accomplishment, likelihood of reward, and meaningfulness of the reward. Neither LPC nor path-goals theories have been explored in the project management context.

While servant leadership characteristics only modestly correlate with contingency theories of leadership, situational adaptability may resonate strongly for servant leaders, since they may possess greater self-awareness alongside the willingness humbly make room for and empower their followers.

The competency school of leadership is presented by some experts as a successor to theories incorporating transformational/charismatic and emotional intelligence frameworks (Turner and Muller, 2006). In this leadership model, competence includes personal traits and emotional intelligence, as well as intellectual knowledge, problem solving ability, and management skills. In developing the LDQ, Dulewicz and Higgs (2004, 2005) identified 15 leadership competencies: seven were emotional (EQ), three intellectual (IQ), and five managerial (MQ). The LDQ has been utilized in evaluating both public and private organizations (Geoghegan & Dulewicz, 2008), including an extensive study of leadership among project managers (Turner & Muller, 2006).

Dulewicz and Higgs (2005) have demonstrated that the LDQ is a reliable instrument,

citing Cronbach's reliability level of alpha greater than 0.7 for all factors. Among LDQ factors with a topical relation to servant leadership factors are self-awareness, empowering, developing, vision, strategic perspective, and interpersonal sensitivity (Van Dierendonck & Nuijten, 2011).

### **Servant Leadership**

Servant leadership is generally acknowledged to have developed from Robert Greenleaf's seminal essay, *The Servant as Leader* (1970), which focuses on developing employees' fullest potential in the areas of task effectiveness, community stewardship, self-motivation, and future leadership capabilities (Greenleaf, 1977).

Greenleaf (1977) gave contemporary voice to the concept of the servant leader, who was described in the following way (p.27):

The servant-leader *is* servant first... It begins with the natural feeling that one wants to serve, to serve *first*. Then conscious choice brings one to aspire to lead. That person is sharply different from one who is leader *first*, perhaps because of the need to assuage an unusual power drive or to acquire material possessions. (p. 27)

This servant-leader model originally appeared as part of Greenleaf's (1970) essay, written in response to the then-recent United States' campus turmoil of the late 1960s, and intended as a message of hope for both disgruntled students and pressured educational institutions. Greenleaf attributed the concept to his reading of Herman Hesse's Nobel-Prize-winning (1946) story, *Journey to the East* (2010), first published in the author's native German language in 1932.

Hesse's story describes the mythical journey of a troupe of men who hire a servant named Leo, who inspires them with his spirit and song. After Leo's departure, the men discover that they cannot function without him. Several years later, the narrator of the story seeks and finds Leo living a humble life in his home country. He is also surprised to discover that Leo was actually the leader of the Order that had sponsored the original journey. This story inspired Greenleaf to integrate the roles of servant and leader as one, leading to publication (1970) of his essay describing the servant-leader. Greenleaf had retired from industry in 1964 and founded the Center for Applied Ethics, which was renamed the Greenleaf Center for Servant Leadership after his full retirement in 1984. While the concept of servant leadership gathered adherents in varied professional settings, it was not until after Greenleaf's death in 1990 that the concept began developing the necessary constructs to be defined as a specific and separate theory of leadership.

While Greenleaf (1977) introduced the term "servant leader" and a conceptual model of servant leadership, its historical context can be traced to the teachings of Jesus Christ. In one reference, found in Mark 9:35 (New International Version), Jesus responded to His disciples' desire for precedence over one another, and to their discussion about which of them was greatest, by offering this command: "Anyone who wants to be first must be the very last, and the servant of all." Jesus illustrated His teaching by washing His disciples' feet (John 10). Nearly two millennia later, this seemingly counterintuitive concept of the servant as leader was reintroduced in a secular way by Greenleaf, providing leadership scholars with an inspirational model of spirituality, ethics, morality, and transformation.

Servant leadership is, first, about the needs of followers, not leaders, and not organizations -- although practicing servant leadership might benefit all. While other leadership models seek to benefit the organization first, servant leadership is focused on the followers' well-being, trusting that they will, in response, achieve goals in the best interest of the organization (Stone, Russell, & Patterson, 2004). Among the corporate advocates of servant leadership is John Bogle, founder and retired CEO of the Vanguard Group, one of the world's largest mutual fund companies. Bogle describes servant leadership, "as much as anything else, the Golden Rule. Do unto others as you would have them do unto you" (Phillips, 2004).

Greenleaf developed only the basic ideas of servant leadership, naming the capacity to go beyond self-interest as its core characteristic and did not provide a succinct definition or a fully outlined conceptual framework. The work of defining constructs and validating the conceptual framework, along with development of valid means of measurement, was left to Greenleaf's followers.

Servant leaders are humble. The servant leader is not afraid to recognize his/her own leadership failings, and in doing so, will also "create an environment conducive to growing and retaining productive and committed colleagues" (Allender, 2006, p.2), a further affirmation of the importance of the servant leader's characteristic of humility. Servant leaders exercise humility which often strongly contrasts with the excess of hubris exhibited by some in high organizational positions (Graham, 1991). This kind of prideful arrogance has caused myriad leadership failures, such as those described in the present study.

Other characteristics demonstrated by servant leaders include self-reflection, self-awareness, and a self-control which offers some moral safeguards against the damaging effects of leadership hubris. Graham (1991) was among the early scholars who expanded on Greenleaf's work, seeking to distinguish servant leadership from transformational and charismatic leadership, since all three styles value visionary capacity and concern for the followers' development. One of the primary differentiating characteristics is the servant leader's focus on being both inspirational *and* moral, elevating the aspirations of the follower above their own interests and goals. The underlying moral accountability encourages followers to keep their own moral counsel, to act and live in an empowered way, as compared with the charismatic leader who encourages sheep-like adherence to the vision, means, and ends of the leader, organization, or cause. Additionally, servant leaders are stewards for their organizations, sensitive to the needs of s both powerful and powerless stakeholders. Graham's (1991) qualitative exposition reintroduced servant leadership to scholarly attention in the emerging *Leadership Quarterly* journal, and prepared the way for the development of additional theoretical constructs.

Servant leaders are multidimensional in their values, beliefs, actions, and behaviors. While the concept of servant leadership has ancient roots in humanistic and religious teachings (Spears, 1996), developing its modern and secular construct required greater quantification and agreement. The essential elements of servant leadership continued to gain definitional traction through work of the Greenleaf Center for Servant Leadership. The intellectual advancement of servant leadership theory was moved forward by Larry Spears (1995, 1996), then-director of the Center who applied his extensive knowledge of Greenleaf's writings to extending the outline and articulating ten

characteristics of a servant leader (Van Dierendonck, 2010) – (1) listening, emphasizing communication and the will of followers; (2) empathy, including understanding and accepting others; (3) healing, and making followers whole; (4) awareness; (5) persuasion, based on argument and not positional power; (6) conceptualization, seeing beyond immediate needs into future possibilities; (7) foresight, seeing situational outcomes with intuition; (8) stewardship, being able to hold something in trust; (9) commitment to the growth of people, by nurturing the personal, professional, and spiritual growth of followers; (10) community-building and emphasis on the essential nature of local communities in followers' lives. This wide and varied set of dimensions underscored the importance of the leader-follower relationship by triggering the first of many definitional constructs for servant leadership as a whole, specific servant leader behaviors, and suggestions of how to measure it in order to advance its empirical study as a valid theory. Liden, Wayne, Zhao and Henderson (2008) later added to this view by proposing that servant leadership stresses personal integrity and serving others, including employees, customers, and communities (p.161).

Because Spears' concepts were never operationalized into an empirically-tested model, that challenge was left to others. Development of theoretical constructs and measurement scales commenced with Laub's (1999) doctoral dissertation. This study proposed six dimensions – values people, develops people, builds community, displays authenticity, provides leadership, and shares leadership – which were also developed into an instrument. Russell and Stone (2002) advanced servant leadership theory by proposing nine functional attributes (vision, honesty, integrity, trust, service, modeling, pioneering, appreciation of others, empowerment) and 11 accompanying attributes observed in leader

behaviors. This list was based on the repetitive presence of these characteristics in the literature published up to that time. This model was never operationalized, but some of its dimensions were subsequently integrated into other models (VanDierendonck & Nuijten, 2011).

Servant leaders are unselfishly concerned for the well-being of their followers, in simple contrast to leaders who give primacy to their interests or those of the organization. In a doctoral dissertation aimed at demonstrating the insufficiency of transformational leadership theory to explain this phenomenon, Patterson (2003) proposed a servant leadership theory construct, leading to the development of a related measure (Dennis, 2004). This model proposed servant leadership as a logical extension of transformational leadership theory and defined seven dimensions of a servant leadership model. In this model, the servant leader is guided by virtues and morals, and is one who: (1) leads and serves with *agapao* love (from the Greek word meaning love in a social or moral sense, and can also be related to the Golden Rule), (2) acts with humility, (3) is altruistic, (4) is visionary for the followers, (5) is trusting, (6) is serving, and (7) empowers followers. In Patterson's concept, servant leadership begins with the cornerstone of *agapao* love and finds full expression with unselfish service. The dimensions of humility and empowerment are directly congruent in vocabulary with the Van Dierendonck and Nuijten (2011) scale, which acknowledged Patterson's (2003) work as part of its lineage.

Servant leadership has global and broad potential for cultural adaptation, as evidenced in the application and evaluation of various servant leadership constructs (Laub, 1999; Patterson, 2003; Dennis, 2004) in diverse locales, cultures, and leadership contexts, including: Ghana (Hale & Fields, 2007), Rwanda (Irving, 2007), women in

Africa (Ngunjiri, 2010), and India (Mehta & Pillay, 2011), with additional studies applied to leadership structures often found in families, tribes, politics, and organizations employing traditional hierarchical and functional structures.

The development of post-Greenleaf constructs and scales for servant leadership does not force a normative or utilitarian view of servant leadership philosophy. Greenleaf's expression and description was highly idealistic and he was apparently not concerned with empirical construction of theory. Patterson (2008) contended that servant leaders must guide from a virtues perspective in the Aristotelian tradition, including focusing on what is good for followers rather than a profit-maximizing agenda. Van Dierendonck (2010), in expressing a vision for future research on servant leadership, welcomed the current trend of empirical descriptive research. The present study measures the utility of servant leadership behaviors of project managers as reflected in outcomes of project undertakings, and seeks to look beyond the theoretical and explore the consequential. In support of this utilitarian perspective, several studies have shown that servant leadership can be a significant predictor of follower outcomes such as organizational commitment and community citizenship behavior (Liden et al., 2008).

Servant leadership is not without critics, nor is it universally welcomed as a leadership approach. Liden et al. (2008) discovered during informal conversations with followers that some saw servant leadership as "micro-management," and others did *not* want their leader to get to know them, experiencing discomfort with those who tried to help and develop them. Johnson's (2001) academic text on ethical leadership classifies servant leadership as a normative theory, suggesting that it can be "unrealistic,



encouraging passivity, not working in every context, sometimes serving the wrong cause, and being associated with negative connotation of the term servant (or slave)” (p. 136).

Servant leadership as initially conceptualized by Greenleaf (1977) lacked measurable definition, with constructive theoretical models having emerged only in the past 20 years.

### **Servant Leadership Theoretical Constructs and Scales**

Robert Greenleaf, the conceptual father of servant leadership, passed away in 1990 before defining or working with researchers to create an empirically validated servant leadership model. In the two decades since, scholars and practitioners alike have proposed an expanding variety of definitions, instruments and scales. Efforts to measure servant leadership have included differing types of dimensions or factors, varied numbers of factors, a wide array of items or questions posed in order to quantify those factors, and inconsistent use of the Likert interval scales.

The evolution of servant leader instruments represents positive progress in the maturity of its theory and in its empirical differentiation from other leadership theories. There remain conceptual overlaps with related leadership theories such as transformational, ethical, and spiritual leadership (Reed, Vidaver-Cohen & Colwell, 2011). While there exists no universally-recognized scale with which to measure servant leadership, the healthy progression of scholarly work and dialogue has yielded a variety of instruments useful to researchers, teachers, and practitioners. This section of the literature review discusses servant leadership scale research and development organized according to year of publication.

Scholar-developed servant leadership scales began to emerge in the late 1990s, beginning with Laub's (1999) Organizational Leadership Assessment (OLA). Seeking to contribute to the evolution of the study of servant leadership, Laub's doctoral dissertation proposed the OLA as a servant leadership measurement instrument, since none had been published at that time. Collecting the initial list of characteristics from the literature, Laub then utilized a three-round Delphi process of 14 topical experts who had either written on or taught servant leadership at the university level. This resulted in six defined dimensions, while factor analysis showed two core foundational dimensions, organization and leadership. The OLA was designed to measure the characteristics of servant leadership within an organization (p.24), as opposed to measuring that of an individual leader. The strength of this scale lies in its extensive application, continued development and improvement, and ability to assess servant leadership at an organizational level. Its principal weaknesses are its high intercorrelation of factors, which undermines the ability to conduct factor-level comparative analysis, and its unsuitability as a measure of dyadic servant leader-follower relationships.

Acknowledging the multidimensionality of servant leadership and seeking to take servant leadership studies beyond the experiential into the empirical, Page and Wong (2000) developed the Servant Leadership Profile (SLP). By contrasting servant leadership from command leadership, the researchers highlighted the differences between servant leaders who serve with heart and those who are task- or process-oriented. Development of the SLP was based on a wide literature review which resulted in a scale of 99 items across 12 factors. An additional factor analysis conducted on this scale using a convenience sample of university-derived participants (Dennis & Winston, 2003) showed

that only three of the items could be measured. A revised scale (Wong & Davey, 2007) is based on five factors, with claims for its use in more than 100 organizational and university studies. Its strengths lie in its evolution and application in real-world studies. The principal weakness of the instrument for possible use in this study is its self-rater construct, in which leaders self-evaluate their behaviors as reflective of their servant leadership qualities. Page and Wong (2000) offered the argument that servant leadership is not a model of weakness, because the servant leader can be “just as tough-minded and resilient as other kinds of leaders” (p.2).

Complexity versus simplicity of the servant leadership construct remains an ongoing debate among scholars (Fields & Winston, 2012). This is evident in the work of Ehrhart (2004) which yielded a new single dimension servant leadership scale while investigating antecedents to organizational citizenship behavior. One distinction of this work was its nearly incidental outcome of having created a new servant leadership scale. The creation of a new servant leadership measure was not Ehrhart’s primary intention and, lacking a clear explanation for its development, no further improvement of this scale has been undertaken by scholars. This work identified seven categories of servant leadership behavior built around two key aspects of servant leadership: ethical behavior and prioritization of subordinates’ concerns. These were contained within a single dimensional scale, with each of the seven categories containing two items, yielding a total of 14 items in the scale. The scale was subjected to construct validity testing by comparing it to the multi-factor leadership questionnaire (MLQ) scale for transformational leadership and the LMX-7 scale for leader-member exchange. The

strength of this scale lies in its brevity which is offset by its weakness in having no further application studies to validate the simplicity of a uni-dimensional construct.

The working theory of servant leadership proposed by Patterson (2003) did not include instrumentation for measurement or validation. Filling this void, Dennis and Bocarnea (2005) published a scale based on the work of Dennis (2004), built around the seven dimensions of the Patterson (2003) model, and further explicated in Dennis, Kinzler-Norheim and Bocarnea (2010). Following the DeVellis (2003) process for scale development, the study included an extensive literature review to develop an initial iteration of 56 items, after which an expert panel was engaged to iteratively refine its constructs. Administering the resulting instrument to a development sample population, the researcher employed a stratified sample from a paid database provider, with a diverse profile set from the same source used by Dennis and Winston (2003). The results demonstrated an instrument that could measure most of Patterson's (2003) theory. A strength of this instrument is its continued use in dozens of studies (Dennis, Kinzler-Norheim, & Bocarnea, 2010), and its use of follower perspective to rate a leader. Its weaknesses included a lack of validation for two of Patterson's (2003) seven dimensions.

In an effort to clarify servant leadership constructs, and operationalize them to support empirical research, Barbuto and Wheeler (2006) proposed a theoretical model based on Spears' definition of servant leadership and its ten characteristics, and included the additional characteristic of calling. Each of these 11 characteristics featured from five to seven items, for a total of 56 total items. The working instrument called the Servant Leadership Questionnaire (SLQ) was administered to 80 elected leaders and 388 of their related followers in the midwestern United States. Factor analysis reduced this to five

principal dimensions comprising 23 total elements, which were found to be a stronger predictor of leader-member exchange (LMX) relationship quality than transformational leadership theory. This was an important finding because it validated the strong leader-follower relationship fostered by servant leaders, reaffirming the foundational tenet that servant leaders can develop deeper relationships than transformational leaders. The strength of this work was found in its research design and use of a coupled leader and related follower evaluation process, allowing the analysis to account for leader self-rater bias and enabling comparison of LMX to transformational theory. Its raters also provided input based on real relationships and perspectives rather than hypothetical situations. The principal weakness of the SLQ -- very high item intercorrelation -- was found in a South African study context which caused it to be classified as a one-dimensional construct (Dannhauser & Boshoff, 2007). This validation study triggered an alternating set of published responses and rejoinders (Barbuto, Story, & Gifford, 2008; Dannhauser & Boshoff, 2008).

Leveraging some of the work done by Page and Wong (2000), Ehrhart (2004), and Barbuto and Wheeler (2006), researchers Liden, Wayne, Zhao and Henderson (2008) conducted a thorough review, analysis, and iterative development to generate a nine-dimensional measure for servant leadership. Conducting a review of the literature with expert content validation yielded an initial seven-dimension, 85-item survey used for a pilot study of 298 students, from which 20% of the scale items were adopted and credited to the prior researchers identified above. After performing a factor analysis, the researchers selected the four highest-loading items in each dimension to arrive at a 28-item scale. Testing with a second sample of 164 employees and 25 supervisors of a U.S.

midwestern company, responses were analyzed using confirmatory factor analysis. Simultaneously, the researchers surveyed the second sample population with instruments measuring transformational leadership and (LMX), as well as outcome variables using organizational commitment (OC) and community citizenship behavior (CCB) scales. Results demonstrated evidence of scale construct validity, while correlation testing against the non-leadership scales explained a sufficient degree of the OB and CCB factors as attributable to servant leadership. One strength of this study was its design using two stages and two independent sample populations, as well as the establishment of the relationship between servant leadership and the OC and CCB outcome variables, which helped to demonstrate that servant leadership can have an effect on organizational outcomes. Limitations of the study include the use of a unique sample population, as well as a lack of confirmatory validation tests, which may, like many scales, evolve over time as researchers choose to use them in studies.

Discriminant and construct validity were seen as an issue when Sendjaya, Sarros, & Santora (2008) introduced the Servant Leadership Behavioural Scale (SLBS), a 35-item instrument representing six core dimensions (factors), based on both literature review and expert perspectives. The six factors developed included (1) voluntary subordination, (2) covenantal relationship, (3) authentic self, (4) responsible morality, (5) transcendental spirituality, and (6) transforming influence, all spread over a total of 35 individually measured items. Evaluation of this construct and scale revealed highly correlated factors, meaning that the scale was measuring the same dimension multiple times. This is undesirable for scale validity. Sendjaya and Cooper (2011) further scrutinized this work, continuing the dialogue about the multidimensional construct of

servant leadership. The 2011 study took the direction of testing a hierarchical model, instead of a traditional regression model. The effort included additional validation studies, using the SLBS in an additional field study alongside two comparative scales (character assessment rating, and the Machiavellian leadership orientation). Using structural equation modeling that strengthened the SLBS validation argument, the results also disproved any social desirability bias (even though the SLBS is an other-rater scale), while also revealing a strong negative correlation between the SLBS and the Machiavellian scale, which was hypothesized. Strengths associated with this scale include positive correlation to the character scale, and strong negative correlation to the Machiavellian scale. Weaknesses include the still-present high factor correlations, which the researchers admit could result in the scale not truly measuring servant leadership behaviors.

The Executive Servant Leadership Scale (ESLS) was introduced by Reed, Vidaver-Cohen, and Colwell (2011) to address servant leadership from within the context of ethical leadership. With a targeted emphasis on top executive leaders, the researchers leveraged the published works of four sets of servant leadership scale researchers to prepare a 55-item list that was reviewed by an expert jury, and then prepared into a survey using a four-point Likert scale. The instrument was applied to a sample population to rate their top organizational leader, with results analyzed using exploratory factor analysis, which sought to identify redundant or overly similar items. Additional confirmatory factor analysis revealed five first-order factors – interpersonal support, building community, altruism, egalitarianism, and moral integrity. One advantage of this scale is its precise application to top-echelon managers in organizations, reducing the

probability of misapplication of items that would not pertain or apply to supervisors or other lower-level organizational leaders. Its weakness also lies in its strength, inasmuch as it may be less applicable for use at lower organizational levels.

Van Dierendonck and Nuijten (2011), as part of an extensive development effort, put forth the servant leadership survey (SLS) as another construct and scale for servant leadership. This work sought to leverage more than a decade of scientific research by others by analyzing the results and shortcomings of more than ten previously published servant leadership scales, and seeking to build upon them and create an even more psychometrically valid instrument. Focusing primarily on the dyadic leader-follower relationship as perceived by the follower, the instrument first took form through the authors' reading of the literature and drafting of a preliminary model (Van Dierendonck & Heeren, 2006). This foundational model was then converged with qualitative data collected through interviews with managers who exhibited servant leadership characteristics, as referred by the European Greenleaf Center for Servant Leadership in Holland. From these, eight characteristics were defined and operationalized using a six-point Likert scale, which were used to begin three rounds of empirical testing. This iterative process of scale development utilized additional critical review, survey completion by several diverse sample populations, and exploratory factor analysis in order to identify variables which were alike, or had something in common, in order to consolidate or eliminate duplicative items. At the conclusion of the third stage of iterative testing, the SLS included eight factors comprising 30 items, which was then tested for cross-cultural validity in English and Dutch languages, the results of which supported the developed structure.



Next, seeking additional measures of validity to avoid some of the limitations of previously published measures, the researchers employed 1,571 persons to compare the SLS in both English and Dutch languages to two other servant leadership measures, as well as to scales measuring transformational leadership, ethical leadership, leader-member exchange theory, charismatic leadership, and transactional leadership. The results of this phase of testing reflected the anticipated overlap with some factors of the aforementioned scales, but also added some unique items while demonstrating construct validity of the SLS.

Finally, extending the comparisons with additional measures of follower well-being and outcomes, the researchers leveraged data collected during parts of the previous test phases to compare the SLS alongside reliable and valid measures of vitality, engagement, job satisfaction, organizational commitment, extra-role behavior, leadership clarity, and self-assessed performance. The results of these analytical tests provided evidence for criterion-related validity. Strengths of the SLS development included use of a peer-reviewed and accepted process, development by a renowned servant leadership researcher, robust empirical testing, and leverage of the benefit of hindsight offered by the published results of studies utilizing predecessor servant leadership scales.

Weaknesses include lack of post-publication validation studies using the scale to confirm and validate its dimensions and items.

The development and maturation of this wide variety of servant leadership constructs and scales since the late 1990s reflects continued academic inquiry regarding the constitution and measurement of servant leadership. The Van Dierendonck and

Nuijten (2011) SLS construct and scale leveraged and improved upon previous studies, and therefore was selected for use in this study.

### **Leadership in Project Management**

Project management is an applied discipline that has attracted research interest from a wide variety of academic disciplines, with one of its intellectual traditions rooted in the social sciences, including the study of leadership as one of the essential research questions among researchers in the field (Soderlund, 2004). Reflecting this increased scholarly interest, longitudinal literature reviews have shown an increasing trend in publication of the project management topic in mainstream management journals (Kwak & Anbari, 2009).

Project managers utilize project teams to accomplish the goals of the project (PMI, 2008). Project management is leader-intensive, and a successful project is the result of the willingness of individuals to engage in a collective effort to achieve a goal (Pinto, Thoms, Trailer, Palmer, & Govekar, 1998), and the importance of effective leadership for project undertakings has been regularly asserted in the literature (Hass, 2009; Gadeken, 2002). Notwithstanding progressive evolution in leadership theory, project management success was traditionally regarded as the application of tools and techniques, regardless of a project manager's leadership style (PMI, 2004). The literature shows that until recently, there remained substantial reliance among practitioners upon tools, techniques, and procedures (Besner & Hobbs, 2006) to promote project success rather than concern for the qualities and style of the project leader.

Recent project management research, however, has shown a positive relation between the project manager's competency and leadership style with the success of the

project (Krahn, 2006), while project management global research (Nieto-Rodriguez & Evrard, 2004, Fig.17) has shown that leadership can have a positive effect on project performance.

New research has demonstrated that the influence of leadership on project outcomes is clear and has identified the project manager's leadership style as a success factor (Turner & Muller, 2006; Dvir, Sadeh, & Malach-Pines, 2006). For example, in an early study of senior project managers by Zimmerer and Yasin (1998), when respondents were asked to allocate the contribution of leadership to project outcomes, positive leadership contributed nearly 76% to the success of a project, while conversely, poor leadership contributed 67% to the failure of projects.

Early project leadership research was often sponsored by the two largest professional societies. Beginning in the 1990s, the PMI and IPMA began to sponsor, fund, and often publish sponsored research addressing the role and function of leadership in projects; this was sometimes seen as a means of fostering the profession of project management (Hodgson & Cicmil, 2007). In a review of historical and contemporary project leadership research literature, Lindgren and Packendorff (2009) concluded that the literature dealing explicitly with theoretical aspects was a small volume of work (p.291), while recognizing that there existed a substantial body of work addressing practice, development and training, and competencies (Slevin & Pinto, 1998) supporting the Besner and Hobbs (2006) observation. Slevin and Pinto (1998) collected field data from practitioners who identified three essential skills categories – leadership, technical, and administrative. Their work also investigated how these skills were developed, for example, through training, conference, on-the-job training, and job rotations. A

substantial part of the early generation of research centered on the practitioner's views and needs (Whitten, 1996), including task-orientation, competence, and abilities, all of which were later researched and explicated in Turner and Muller (2005).

Federal agencies in the United States, such as the Defense Systems Management College (DSMC), now known as the Defense Acquisition University, recognized that the project manager's primary role is to provide leadership. In a study published in a volume entitled *The Frontiers of Project Management Research* (Slevin, Cleland, & Pinto, 2002), Gadeken (2002) described DSMC's intentional focus on personal project leadership competencies using a qualitative research process. Results revealed eight underlying themes that characterized the best project managers, including big-picture perspective, empowering the best people for their project teams, and thriving on relationships and influence, rather than power. Underscoring the differences between the roles of project managers and functional managers (those who manage groups of persons with specific skill sets and who are permanent organizational entities), additional validation surveys found significant differences in rankings between the two groups.

The leadership character of the project manager makes a difference in the view of followers. The PMI (2008) suggests some of the desirable characteristics of the project manager that extend beyond competency and knowledge. These include leadership when guiding the project team, as well as personal behavior, including "how the project manager behaves when performing the project" (p.13). In a study that sampled 100 senior project managers with at least ten years of experience, the 12 highest-rated leadership characteristics included demonstrated trust, demonstrated respect, developed employees, and empowered subordinates (Zimmerer & Yasin, 1998). It is precisely this importance

of empowering and developing project team members that distinguishes servant leadership as a valid model for project management practice.

The leadership behavior of the project manager has been shown to be crucial. How the project manager responds to challenges regarding the position's inherently limited authority over project team members has been the subject of two important and informative studies. In one of the earliest studies of leadership in project management, Thamhain and Gemmill (1974) recognized the authority gap experienced by project managers, and investigated the influence methods they employed compared with project performance. Findings showed that from among eight influence methods identified, the use of authority as an influence method had a negative effect on project performance. While this study was recognized as ground-breaking (Sotiriou & Wittmer, 2001), its use of a small sample size of 88 persons within a single electronics company limited its generalizability. In an undertaking that replicated and tested the findings of the earlier study, Sotiriou and Wittmer (2001) used a much larger sample (1,080 team members) from more than ten different industries, including aerospace (338 persons). Furthermore, some of the newer findings were deconstructed according to industry and sector. The research process surveyed the project team members at several public and in-house project management training seminars, asking the respondents to rank the same Thamhain and Gemmill (1974) influence methods in terms of relative importance and effectiveness, with some revision to the instrument to attain gender neutrality and improve clarity.

The 2001 study found that project manager knowledge and professional integrity were most highly correlated to management effectiveness, followed by the manner and

degree with which the project manager exercised project authority, then by the degree to which the project provided challenging work. Project authority, or the right to suggest what and when something needs to be done, was distinct from supervisory authority, being the right to render decisions that must be followed. This distinction further underscores the need for the project manager to rely upon influence to accomplish goals as opposed to coercion through power. In a smaller related study reported in the same publication (Sotiriou & Wittmer, 2001), the researchers asked 250 aerospace project team members to rate the importance of four additional techniques used to overcome the authority gap. Among these, personality and/or persuasive ability, which can be related to transformational or servant leadership styles, ranked highest with 76% reporting it as very important. Competence, which can be related to Muller and Turner's competency school of project leadership (2006), ranked not far behind at 63%. In contrast, negotiation and reciprocal favors, which might be related to transactional leadership behaviors, were rated lowest at 44% and 3% respectively. In conclusion, the study recognized that while project leaders can use many methods to fill the authority gap, project members' need to believe in their leaders relies on providing challenging work, having competence, and behaving with integrity and ethical character. Covey (2002), for instance, endorsed moral authority as the core of servant leadership.

Views on the practice and preference of leadership behaviors by the project manager may differ by gender. The variance of gender views on project manager leadership behavior was studied by Neuhauser (2007), who explored perspectives of female project managers. With a sample of 62 female project managers from eight industries, 94% of whom had less than 20 years of experience, a survey measured the

importance of 50 behaviors on a four-point Likert scale that represented transformational leadership, transaction leadership, and managerial skills. Each item was rated not only in terms of importance as viewed by the female project manager, but also rated for frequency of use by other female project managers. The results of respondents' perspectives on most important and least important project manager leadership behaviors did not vary greatly between transformational and transactional styles, but did identify a strong preference for meeting the emotional needs of team members. Results regarding leadership behavior frequency of use by other project managers was confounding vis-à-vis prior research that was gender neutral, as noted by the author, and showed less frequent use of transformational behaviors. An additional set of four questions regarding women's perceptions of male attitudes toward female project managers reinforced prior study conclusions regarding female competence, where the sample in this study actually believed they were weaker project managers than they believe men perceived them to be. This work by Neuhauser (2007) may have exposed some serious gender issues among project leaders. The present study collected gender data about the project manager (leader). While gender distinctions are not related to the research question, comparative gender analysis for servant leadership behaviors may be possible and insightful.

The leadership competency of the project manager has been affirmed as very important. A study of project manager competencies by Brill, Bishop, and Walker (2006) reflects academia's interest in education and training for project managers. In an effort to move beyond training for project management processes with greater focus on competencies, this study employed a two-round Delphi method to derive project manager skills and knowledge consensus from 598 respondents having relevant alumni affiliation

to the researchers' university. First round qualitative coding analysis was conducted on 147 responses from persons having 20 or more years of project management experience, which yielded 117 success factors in nine categorical classifications. A quantitative approach was used in the second round, which engaged multiple sampling techniques from the original 598 respondents to process responses from 79 persons with at least six years of project management experience in industry, education, and government. The results showed how this population highly valued some of the leadership competencies found in the servant leader. Among the 78 success factors examined, conducting business ethically was ranked third, listening effectively was ranked sixth, and willingness to share credit for successes, a leadership competency, was ranked seventh. No leadership competencies were found among the bottom 10 rankings. Among the nine competency categories, leadership expertise ranked first (68.7%), rated either very or extremely important.

Research into the effect of the project manager as a contributor to project success was thoroughly examined as part of an extensive research project sponsored by the PMI. Turner and Muller (2006) promoted the competency school of project leadership, which they defined as incorporating knowledge, skills, and personal characteristics. This effort considered two research questions, the first of which is most pertinent to the present study of project leadership and success: Does the project manager's competence, including his or her leadership style, influence project success? (p.xi). Among the three components of competence, the study focused on evaluating personal characteristics, particularly leadership style as represented by emotional intelligence, as contributory to project success. Using a mixed methods inquiry, this study measured the 15 factors of



leadership competence, which includes personal characteristics as well as knowledge and skills, using the LDQ (Dulewicz & Higgs, 2004, 2005) to provide independent variable data. The study next considered the dependent variable of project success, compromising on an adaptation of five items from a Dutch language scale while adding an additional five items of their own. Project type was proposed as a moderating variable to answer the second research question. The researchers validated and adjusted their research model, including instruments, after conducting 14 semi-structured interviews of managers of project managers from eight countries and several different industries. The quantitative process was next launched via a web-based survey of project managers that produced 400 valid responses to collect data for the dependent, independent, and moderating variables. The results supported the initial hypothesis that the project managers' competency, which included their leadership style, contributes to project success. Within the factor clusters of the LDQ, the study concluded that EQ was the most closely related to project success, while among the LDQ items, sensitivity had the greatest impact on success for high complexity projects, conscientiousness (equivalent to integrity and courage) and motivation had the greatest impact on success for engineering projects.

Max DePree (2002), son of the founder and former CEO of the Herman Miller Company, believed that a broadened definition of leadership competence is necessary for servant leadership. Others have extended the relationship of the leadership dimension with the addition of parameters and variables that measure project success (Crawford, 2002; Davis, 2008; Dyett, 2011; Geoghegan & Dulewicz, 2008; Jugdev & Muller, 2005; Krahn, 2006; Lloyd-Walker & Walker, 2011; Shi & Chen, 2006; Yang, Huang, & Wu, 2011).

Extending the essential project leadership-success inquiry into a multi-industry global study, Prabhakar (2005) posed the research question, “Which leadership approach leads to a higher level of project success?” (p.53) and conducted a two-phase empirical study of 153 project managers in 28 different countries. This study also sought answers to how leaders switch between different approaches to be successful. Utilizing a mixed methods approach to inquiry, the process engaged only project managers, using interviews, the most recent MLQ leadership scale to measure transformational leadership and idealized influence behaviors, an older Stogdill scale to evaluate task-relationship behaviors, and the Project Implementation Profile (PIP) (Pinto & Slevin, 1988, 1994) to measure project success. Among the diverse findings, Prabhakar noted that project managers who are relationship-oriented experience more successful projects, with a strong correlation found between relationship orientation and project success. Further evidence was seen that project managers switch or adapt their leadership styles, whether consciously or not, reflecting the notion that no one style is considered suitable for every project situation.

In a study which took into account the unique challenges of leading technical and scientific employees who tend to be highly specialized, such as those found in aerospace and defense projects, Thite (1999, 2000) sought to establish the relationship of transformational leadership behaviors and the success of technical projects. Sampling a population of 36 private and public organizations developing information systems projects in Australia, the study examined one more successful and one less successful project in each organization. For each project, a three-dimensional perspective was collected. Project sponsors, managers, and team members were queried about the

transformational and transactional leadership behaviors of the project managers using the MLQ Form 5X scale (Bass & Avolio, 1990) and additional technical elements not found in the MLQ. In addition to capturing leadership data, three contingency factors for project success were collected using the PIP (Pinto & Slevin, 1988, 1994). The study found that followers who rated their project managers higher for transformational leadership behaviors were those associated with more successful projects, with strong correlations to the factors for project success. Of import, the study also noted that there is no one leadership style suitable for all situations in technical projects and that project success is also contingent upon other factors such as senior management support, project mission clarity, and appropriate resources.

The value of the servant leader's qualities in project leadership is clearly aligned with what the project leadership literature has identified as significant needs. Whitten (2000) opined that a project manager must be sufficiently technical, with the leadership quality of willingness to call upon the experts in the project team, which might, by extension, be associated with the quality of humility as defined in the servant leadership construct (Van Dierendonck & Nuijten, 2011). Servant leadership can also be a project management style that enables intrinsic motivation, which is a key element for a successful project (Schmid & Adams, 2008).

Project management research has examined the relationship of project management and leadership styles such as transformational, transactional, traits, situational, and other self-titled leadership styles (Al-Husseini, 2006; DiMarco, Goodson, & Houser, 1998; Gehring, 2007; Pinto & Trailer, 1998; Turner & Muller, 2006).

However, in recent years project management research has not kept pace with, nor fully

incorporated, some of the current major leadership research, lacking extensive inquiry in the convergence of project studies and leadership research (Lindgren & Packendorff, 2009, p.290).

### **Project Success: Definitions, Factors, and Scales**

The role of project leadership and its relationship to project success (Muller, Geraldi, & Turner, 2011) is an active domain of research (Turner & Muller, 2005; Dvir, Sadeh, & Malach-Pines, 2006). The issue of what constitutes project success, the factors that determine the success or failure of a project, and how to measure them, are crucial questions for project management research (Cooke-Davies, 2002; Soderlund, 2004). Consideration for the contributions of the project manager or leader to the success of a project endeavor is heavily dependent on the nature and definition of success (Turner & Muller, 2005) and is highly diverse (Ika, 2009). There remains no singular agreement on the definition of project success, though many critical success factors (CSF) have been hypothesized and studied (Slevin & Pinto, 2006).

In an extensive literature review of leadership style as a success factor, when recounting the literature on project success and success factors, Turner and Muller (2005) cited the work of Pinto and Slevin (1988) as a “classic piece of work” that “is one of the most widely quoted lists” (p.56) and is also independent of the project manager. It is precisely for this reason that it serves as an excellent scale against which to compare different leadership styles. Ika (2009) further recognized the work of Pinto and Slevin (1986) as among the first project success proposals with a scientific basis.

The CSF study took root when Pinto and Slevin (1986, 1988, 1998, 1995) saw that project implementation success had many definitions with a large variety of criteria.

Having noted the ambiguity of definition and difficulty of measures for project success (Finch, 2003; Pinto & Slevin, 1988a), these two researchers undertook a lengthy series of efforts to develop a comprehensive measure and scale for project CSF. The simplest Pinto and Slevin (1995) definition of project success incorporated four basic elements: (1) completed on schedule [time criterion], (2) completed on budget [monetary criterion], (3) accomplished the agreed-upon goals [effectiveness criterion], and (4) accepted and used by clients or end users [client satisfaction criterion]. Given that definition of success, the next essential question was: How does a project manager arrive there, and how should it be measured? The identification of a ten-factor model began in the 1980s (Pinto & Slevin, 1986) when more than 50 managers with project involvement were asked to identify those things that could help a successful project implementation. The responses were sorted by the researchers into ten categories and tested iteratively. This initially produced a 100-item instrument which was refined to a 50-item instrument (five items per factor). The resulting PIP was field tested among more than 400 projects to conduct empirical verification. In combination, the ten CSFs were found to be able to explain more than 61% of the causes of project implementation success (Pinto & Slevin, 1995).

The PIP (Pinto & Slevin, 1994) was subsequently published as a standalone self-assessment instrument for use by project managers to make periodic assessments of their project during its active implementation (p.2), and thereby enable the project manager to make changes in his or her approach and methods. The ten CSFs are: Project mission, top management support, project schedule/plan, client consultation, personnel, technical tasks, client acceptance, monitoring and feedback, communication, and troubleshooting

(Pinto & Slevin, 1994). The full PIP survey (1994) is part of a handbook which consists of 62 questions, all of which use a seven-point Likert scale ranging from 1 as “strongly disagree”, 4 as “neutral” to 7 as “strongly agree” (Pinto & Slevin, 1994). Fifty of these questions represent the ten CSFs and are normative in nature; that is, they tend to represent those things that a project manager should do in order to achieve success. The PIP instructions advise the project manager to evaluate the progress of their project against the ten CSFs periodically during the life cycle of their project (Pinto & Slevin, 1994, 1995). To aid the project manager, the handbook additionally provides a comparison of the respondent’s results to a database of 409 prior projects as shown along a quintile scale, from 0 to 100% with increments of 10%. The final 12 questions are intended to capture the end result of the overall project performance. This eleventh factor – project performance – is not a critical success factor, but is utilitarian in nature, that is, it represents the results or outcome of the project. The present study utilizes only the eleventh factor – project performance – in evaluating the success of the projects to be sampled. The PIP was selected for this study based on its extensive use by hundreds of projects (Pinto & Slevin, 1995). Among recent studies, the PIP was used by Geogohan and Dulewicz (2008) and tested for reliability, with a resulting coefficient of reliability (Cronbach’s alpha) of 0.81, which reflects a very good score for strength of association.

### **Servant Leadership in Project Management**

Servant leadership is missing from contemporary project management leadership research literature. The literature exploring servant leadership in the project management context is very limited and has emerged only in very recent years, yet provides both anecdotal and scholarly support for the present study. While there is at present no

published peer-reviewed work addressing the application of servant leadership to the project management context, the material published indicates an emerging interest in the convergence of the two topics. The scarcity of literature on servant leadership by project managers is among the rationalizations for continuing studies of these topics (Creswell, 2009, p.105).

In a doctoral dissertation, Thompson (2010) initiated one of the first research efforts to empirically relate the qualities of servant leadership in project managers, and the effect on project outcomes. The following are the differences in research design from Thompson to the present study. Thompson's study utilized self-developed scales to measure servant leadership characteristics and project success that were each tested for reliability resulting in a satisfactory Cronbach's alpha; no validity tests were undertaken. The present study utilized two instruments, the SLS and the PIP, to measure similar variables as Thompson, which were instruments developed by scholars and published in peer-reviewed journals. The PIP (Pinto & Slevin, 1988, 1994) has been in continuous use for more than 20 years, while the SLS (Van Dierendonck & Nuijten, 2011) is new but incorporated lessons learned from other peer-reviewed instruments. Each instrument has satisfactory reliability scores, and was prepared using multistage testing to adjust for learned validity performance.

Thompson's sample population was drawn from self-selected participants contacted via the PMI research web site and then directed to an online survey. The survey population was comprised of any persons associated with projects in several possible capacities, including project manager, project team member, customer/user, and sponsor. The present study utilized web sites from LinkedIn® from which to solicit participants,

with a specific target audience of project team members who were able to specifically answer questions about a real project and the project manager. Thompson's survey was not directed at any particular industry, while the present study focused on the aerospace and defense industry. Thompson's survey asked respondents questions about their own project leadership experiences and opinions, and also collected data regarding the respondent's opinion about what contributes to good project leadership. Thompson's study did not solicit data regarding real or actual projects; rather, it posed hypothetical questions about what constitutes successful projects, good leadership, and successful project manager traits. The present study did not utilize any self-rater perspectives, only other-rater data about a project manager, but used the SLS scale to rate the servant leadership behaviors of specific, real-world project managers, and the PIP scale to rate the corresponding project success for specific, real-world projects.

Thompson's survey received 308 valid responses associated with more than half a dozen different industries. The Thompson study learned what the various categories of project contributors (managers, members, sponsors, etc.) thought would constitute good leadership characteristics, and related them to the servant leadership style. The present study collected data about what project members (followers) actually observed and experienced regarding their real project managers' behavior, and to compared it to their perspective(s) about the outcomes of that project. Thompson's analysis included descriptive statistics and correlation analysis in order to derive inferences. As part of the hypothetical nature of the inquiry, the study concluded that servant leadership could influence project managers' leadership and, as a result, could influence the project toward successful project outcomes. In contrast, the present study evaluated actual projects in



order to determine if and how servant leadership behaviors had a bearing on and relationship to the outcome of the project.

Servant leadership principles and practices in the project management context have been promoted in the popular practitioner press without any empirical study basis. Lichtenwalner (in Perry, 2009), translated the ten principles of servant leadership endorsed by Spears (2005) into brief fables intended to apply to project managers. In these stories, servant leadership was espoused as an alternative to the “hero-based” conventional leadership model of the Viking warrior or the come-from-behind quarterback. Project managers, who by definition lack positional power (Thamhain, 2008), are already reliant upon listening and persuasion to accomplish project goals, and are thus well suited to adopting the principles of servant leadership. Though not based on research, Lichtenwalner’s admonitions attempt to advance a message that servant leadership is a valid alternative to autocratic, bureaucratic, or task-oriented project leader tendencies.

Servant leadership principles were endorsed as the foundation for project leadership by Ferraro (2008), who defined the service-based project leader as an alternative an emerging global commoditization of project management skills by those who advocated the codification of practices promoted by international project management organizations, such as the PMI and IPMA. As part of a volume intended to motivate and guide project management practitioners in achieving personal and organizational transformation, Ferraro argued that the new role for project managers “is to serve the project organization, creating a meaningful experience for team members, customers, and critical stakeholders” that will not only lead to successful projects, but

enable the project manager to become the “spearhead of transformational change” (p.13). As a way for the practitioner to differentiate oneself from global trends that pose career and development risks for the certified project manager, the service-based project leader rides the trends of ethics and digitized community, finds meaning in creation and commitment, and uses self-guided means to build strengths as part of a leadership pyramid model. While not directly aligned to or derived from the Greenleaf, Spears, or related servant leadership models, the Ferraro message resonated with servant leadership theory elements of vision, trust, and creation of a “meaningful experience” for followers.

Some project management scholars have called for project management research to engage perspectives beyond the prevalent focus on project leadership skills and competencies (Lindgren & Packendorff, 2009). Peer-reviewed publications, while evaluating many leadership theories in the project context – including transformational, transactional, and situational (Turner & Muller, 2006) – have not yet evaluated servant leadership among its constructs. The present research contributes to filling this gap in both the project management and servant leadership literatures.

### **Rationale for servant leadership in project management**

Organizations that undertake technology-intensive projects (Kerzner & Belack, 2010), such as those found in aerospace and defense, have come to recognize and appreciate the importance and influence of project leadership (Geogohan & Dulewicz, 2008; Lindgren & Packendorff, 2009; Shi & Chen, 2006; Thamhain, 2004; Thamhain, 2008). Such projects are characterized by high speed, high change, and high uncertainty and risk (Pinto & Mantel, 1990; Zhang, Keil, Rai & Mann, 2003).

Expensive, technologically sophisticated and risky projects are often sponsored by large business enterprises with an eye on profitability, or by governments intent upon promoting the public welfare or national defense; examples include megaprojects (Cicmil, Hodgson, Lindgren & Packendorff, 2009) such as the English Channel tunnel (Chunnel), space exploration vehicles (from the U.S. National Aeronautics and Space Administration), military predator drones (from the United States Department of Defense), fuel efficient aircraft (from the Boeing Company's 787 Dreamliner), supercomputers (from several technology firms in several nations) and electric cars (entering the consumer marketplace from several global automobile manufacturers in the 2010s). Project managers for such undertakings must not only manage inside the project, but may also need to be externally-facing, for which the servant leadership quality of stewardship (Van Dierendonck & Nuijten, 2011) is particularly well-suited – that is, managing for the good of the whole, with societal responsibility, and having a long term vision. Project leaders operating in the external environment for these complex projects must often “negotiate diverse and emerging issues in dynamic and changing economic, social and environmental contexts” (International Centre for Complex Project Management, 2011). Coping with such diverse and challenging external environments may warrant the strong sense of self-awareness and authenticity of a servant leader (Van Dierendonck & Nuijten, 2011).

In addition to projects undertaken in the aerospace and defense industry, for-profit enterprises use project organizations to introduce new products and services to the consumer and business marketplaces; these also experience significant rates of failure (Cooper, 2001; Griffin, 1997). Successful product innovation can bring high-profile

media popularity, with examples such as Apple Computer's iPod and iPhone products (Burns, 2009). Successful projects may also become a source of corporate or national pride (Hodges & Quinn, 2011; Kopytoff, 2011), as in the 1960s when the United States accomplished President Kennedy's challenge goal of putting a man on the moon. While success can breed hubris, as exemplified in projects such as the *Columbia* disaster (Petroski, 2006), the courageous yet humble servant leader/project manager emphasizes the societal responsibility of the undertaking (Van Dierendonck & Nuijten, 2011).

When projects are successful, which can be loosely defined as fulfilling their intended use and achieving their functional goals within the original allocations of time and money (Anantatmula, 2010; Frese & Sauter, 2003; Kloppenborg, 2009), they are lauded (Rad & Anantatmula, 2010), and can provide real benefit to their sponsoring entities (Cooke-Davies, 2002) with substantial impact and benefit to overall organizational and business performance (Crawford, 2005). Yet when projects fall short of expectations, or "fail", the outcomes can be disastrous, such as the loss of life in the United States' space shuttle *Challenger* explosion in 1986. Some part of this tragedy was attributed to a failure of leaders to listen to their project team member; this led to groupthink and ultimately to the fatal decision to launch the space shuttle (National Aeronautics and Space Administration, 1986). Circumstances such as this might be avoidable if directed by a servant leader who practices humility and is willing to learn from others (Van Dierendonck & Nuijten, 2011).

Failures such as the *Challenger* disaster should drive project leaders to recognize a dependency upon willing followership. It behooves project managers to seek to understand followers' needs and interests, and to demonstrate care for them. Projects by

definition have finite duration (PMI, 2008), and project managers have only indirect authority over the project organization. In cases where project leadership is applied with cross-functional or cross-organizational environments (e.g., a matrix design or multi-organizational design), the project manager is compelled to be mindful of his/her authority-responsibility mismatch, which renders them more open and liable to failure if the project team members do not accept them or their leadership; this has been referred to as the “authority gap” (Sotiriou & Wittmer, 2001, p.16). Cleland (1995) suggested that project leaders assume responsibility for the needs and rights of those people who choose to follow them.

However, even though the project management profession has seen enormous growth in its formal process of professionalization (Lindgren & Packendorff, 2009), as reflected in the certified Project Management Professional credential awarded by the PMI (PMI, 2008), subtle aspects of leader-follower relations are largely left unexamined. By studying servant leadership as a technique for project management in the aerospace and defense industry, the present research contributes to the ability of project management organizations to evaluate, encourage, develop, and support project managers in the development of leadership characteristics that are instrumental for leading successful aerospace and defense projects.

Leadership development is also an important outcome for aerospace and defense technologists who become project managers. Projects are an important crucible for leadership development since they are often not formal managerial assignments (Lindgren & Packendorff, 2009). Preparation for leadership of an aerospace and defense project can have complicating factors, because leaders of technology projects commonly

originate from within the technical ranks. As a result, project leaders are not always prepared for the leadership role (Carbone & Gholston, 2004; Forsberg, Mooz, & Cotterman, 2005; Simmons & Korrapati, 2004), are frequently undertrained or - developed in the science and art of leadership (Farr & Brazil, 2009), and may be unaware of the styles and behaviors available to them. As a consequence for failures, project stakeholders may seek new technologists or new leaders for their projects, as in the replacement of the program manager as a result of Boeing's delays in delivering the Dreamliner 787 aircraft (Associated Press, 2007). Such project managers are often engineers or technologists themselves (Carbone & Gholston, 2004) whose roles are sponsored by stakeholders from within the political, business, or military bureaucracies (Government Accountability Office, 2010), and who are sometimes misplaced in such positions due to their technical excellence, regardless of their leadership qualifications (Farr & Brazil, 2009; Lewis, 2003).

Project managers may not be informed or trained in how to become leaders. Valuable insight on leadership development in an engineering department population was gained in the work of DiMarco, Goodson, and Houser (1998). In exploring the value of situational leadership training for project leaders in a matrix organizational structure, the method included the completion of evaluation instruments by the followers of the target leader, an approach applied in the present research, which concluded that the inputs and perspective of followers/subordinates was essential in measuring and determining the effectiveness of a situational leadership development program. Calls for leadership development of technology-based project management practitioners, especially engineers, highlight the need for deeper institutionalization of leadership development for

technologists (Farr & Brazil, 2009; Carbone & Gholston, 2004). This is further underscored in the assertion of Kouzes (1998) that "leadership isn't a position; it's a process. It's an observable, understandable, learnable set of skills and practices available to everyone anywhere in the organization." (p. 211).

By examining the relationship between project leadership behaviors and project outcomes, the present study can help organizations to consider if their leadership development paradigms have valid leader learning objectives, as well as gain insight into the project manager's current state of development as perceived by project followers.

### **Summary**

This exploratory review of the literature has outlined servant leadership in conceptual terms and explained its relationship to selected general leadership theories. It has summarized key leadership aspects of the project management literature, and delved more deeply into the literature of two parallel paths – servant leadership as a theory and practice for leadership, and project management leadership – followed by an assessment of the literature related to project success. Throughout, the parallel paths of servant leadership and project leadership have been integrated and synthesized to characterize the relationship of servant leadership to the success of projects.

The extensive literature on leadership, servant leadership, and project management leadership has little convergence, attributable to some extent to the ongoing evolutionary nature of servant leadership theory. From the project manager's perspective, there are no peer-reviewed and very few academic inquiries for the application and utility of servant leadership. Additionally, while project success has been studied and published extensively, its relationship to the servant leadership style has been limited to non-peer

reviewed studies. The present study contributes to these domains of literature by quantifying the relationship between servant leadership behaviors and project success in the aerospace and defense industry.

Because leadership has an effect upon the success or failure of projects, researchers have increased their study of leadership practices and styles in projects (Gehring, 2007; Keller, 2008; Krahn, 2006; Lindgren & Packendorff, 2009; Shi & Chen, 2006); however, not all leadership theories have been examined in the project management context. In order to consider whether the deficient positive leadership behaviors seen in failed projects might be avoided in the future, the present study examines the servant leadership concept for aerospace and defense project managers. This work contributes toward closing a gap in the literature for the convergence of servant leadership and project management, and demonstrates the existence and strength of a relationship between the servant leadership behaviors demonstrated by project managers and the success of their projects.



## CHAPTER 3

### RESEARCH METHODS

#### Purpose

The central research theme for this study – examining the relationship between servant leadership behaviors demonstrated by aerospace and defense project managers and the success of their project – was examined by evaluating aerospace and defense project managers and projects as seen through the eyes of their followers and measured using reliable and valid multidimensional scales.

Based on the experiential information presented in the literature review, servant leadership is shown as a model that could contribute to overcoming many of the leadership issues faced by aerospace and defense project managers. The current literature on the definition of servant leadership, as well as the need to operationalize its varied measures, demonstrates that conducting an empirical study in the previously unexamined industry context of aerospace and defense project management may yield value for the development of both theory and instrumentation.

#### Research Question

The following principal research question was investigated: What is the relationship between servant leadership behaviors demonstrated by aerospace and defense project managers and the success of their project? This study addressed the degree to which a project manager, in a leadership role on an aerospace and defense project, exhibited the behaviors of a servant leader, and how that related to the success of his/her project.

## Null Hypotheses

Based on the eight servant leadership factors derived from the SLS scale from VanDierendonck and Nuijten (2011), and the single project success factor derived from the PIP scale from Pinto and Slevin (1988, 1994), the following null hypotheses were used to test the research question. Since examination of the literature has shown no previous research examining these SLS variables as related to the PIP variable, the current null or default condition is taken to be negative, since no variable relationships have been proven.

$H_{a01}$ : There is no relationship between empowerment as demonstrated by aerospace and defense project managers as defined and measured by the factors of the Servant Leadership Survey and the success of their project as measured by the Project Implementation Profile.

$H_{01}$ : There is no relationship between standing back as demonstrated by aerospace and defense project managers as defined and measured by the factors of the Servant Leadership Survey and the success of their project as measured by the Project Implementation Profile as measured by the Project Implementation Profile.

$H_{03}$ : There is no relationship between accountability as demonstrated by aerospace and defense project managers as defined and measured by the factors of the Servant Leadership Survey and the success of their project as measured by the Project Implementation Profile.

$H_{04}$ : There is no relationship between forgiveness as demonstrated by aerospace and defense project managers as defined and measured by the factors of the Servant

Leadership Survey and the success of their project as measured by the Project Implementation Profile.

H<sub>05</sub>: There is no relationship between courage as demonstrated by aerospace and defense project managers as defined and measured by the factors of the Servant Leadership Survey and the success of their project as measured by the Project Implementation Profile.

H<sub>06</sub>: There is no relationship between authenticity as demonstrated by aerospace and defense project managers as defined and measured by the factors of the Servant Leadership Survey and the success of their project as measured by the Project Implementation Profile.

H<sub>07</sub>: There is no relationship between humility as demonstrated by aerospace and defense project managers as defined and measured by the factors of the Servant Leadership Survey and the success of their project as measured by the Project Implementation Profile.

H<sub>08</sub>: There is no relationship between stewardship as demonstrated by aerospace and defense project managers as defined and measured by the factors of the Servant Leadership Survey and the success of their project as measured by the Project Implementation Profile.

H<sub>09</sub>: There is no predictive relationship between the eight SLS factors as demonstrated by aerospace and defense project managers as defined and measured by the factors of the Servant Leadership Survey and the success of their project as measured by the Project Implementation Profile.

## Instrumentation

Within this framework of leadership and project management, two subordinate constructs were selected for this study of the intersection of servant leadership (Van Dierendonck & Nuijten, 2011) as applied to project management, and project success (Slevin & Pinto, 1988, 1994).

Servant leadership is a relatively new concept within the leadership literature and, as a result, its theoretical models and scales of measurement are still being developed. In contrast, project leadership has been an active topic of research by academicians and practitioners within the project management discipline with many studies sponsored by the Project Management Institute (PMI) and the International Project Management Association (IPMA). The related avenue of inquiry which seeks to define and measure project success has also frequently examined the contributions of project leaders. By leveraging existing scales for servant leadership and success in project management, a convergence of these components can be used to address the research question.

Most scholarly attempts at developing servant leadership measures followed some recognized scale development process (DeVellis, 2003) and seek to achieve a high standard of reliability and validity. Reliability reflects the accuracy of the measuring instrument and validity reflects that the test is measuring the right thing (Kerlinger & Lee, 2000). Central in many of the contrasting views expressed in peer-reviewed works is the issue of high correlation among the dimensions (factors) of the various proposed constructs, and whether or not, as a result, many scales purporting to measure three or more dimensions are actually measuring only one or two dimensions (VanDierendonck, 2011).

Two self-assessment survey instruments were utilized to collect quantitative data for the present study. The PIP (Slevin & Pinto, 1988, 1994) was used to measure the 12-item, single factor of project success as rated by project members from the sample population, and provided data for the dependent variable. The SLS (Van Dierendonck & Nuijten, 2011) was used to measure eight factors totaling 30 items of project manager servant leadership as rated by project members from the sample population, and provided data for the independent variable. Using identical seven-point Likert scales, the use of the PIP and SLS instruments yielded interval data about the variables under consideration. Detailed descriptions of these instruments are provided in Chapter 2.

#### Project Implementation Profile (PIP)

The dependent variable, which is the success of the project led by the respondent-identified project manager, was measured using the single factor PIP, the results of which have been presented with a set of descriptive statistics, including means, standard deviations, as well as inferential statistics. A copy of the survey instrument and its items is included in Appendix C. The PIP was developed by Slevin and Pinto (1988, 1994) and includes 11 factors, 10 of which are process-related and are used to predict or reflect the outcome (project performance). This study utilized the single eleventh factor (project performance) which is a 12-item outcome culmination of the other factors used in the instrument, and reflects the success of the project. Permission to use the PIP was obtained from D. P. Slevin and J. K. Pinto (personal communications, August 10, 2011) as shown in Appendix A. The PIP eleventh factor uses a seven-point Likert scale and measures project members' perceptions of the following 12 items of project success: schedule, budget, functional, audience, benefit, solved the problem, use, process, user acceptance,

user performance, positive impact, and improvement. The rationale for selection of the PIP is its validation resiliency in hundreds of studies, its strong reliability and validity performance demonstrated in recent studies (Geogohan & Dulewicz, 2008), and its use in recent studies undertaken to relate project leadership to project success (Morgan, 2012). While developing the PIP, Slevin and Pinto (1988) asked respondents to consider a successful project and then define those activities they believed led to increased project success. Using an iterative and repeated process, ten critical success factors were then derived as part of a 50-item instrument. These ten critical success factors were generalized for various project types as part of a study of more than 400 projects, which significantly validated the PIP (Slevin & Pinto, 1988). The eleventh factor was then developed for evaluators to provide an overall assessment of project performance (Slevin & Pinto, 2004, 2006), which is the principal dependent variable used in the present study.

Servant Leadership Survey (SLS)

The independent variables, which are the servant leadership behaviors of project managers, were measured using the SLS as rated by project members, the results of which were presented with a set of descriptive statistics, including means, standard deviations, as well as inferential statistics. An advantage of using the SLS to have followers rate their project managers is the avoidance of self-rated bias that might have occurred had the project managers rated themselves. A copy of the SLS and its factors and items organized in the order they were presented to the respondent is included in Appendix B. Permission to use the SLS was obtained from D. Van Dierendonck (personal communication, April 10, 2012) which is shown in Appendix A. The SLS instrument was administered to the sampled project members used the SLS embedded as

part of the survey to share their perception of the servant leadership qualities of their self-identified and affiliated project manager.

The SLS quantifies followers' observations of the following eight factors of servant leadership, listed here in alphabetical order, while in the survey, the questions (items) associated with each factor are listed in various non-clustered order:

accountability, authenticity, courage, empowerment, forgiveness, humility, standing back, and stewardship.

The SLS was selected for use in this study as a result of its (a) development using a peer-reviewed and accepted process, (b) development by a renowned servant leadership researcher, (c) robust empirical testing, and (d) leverage of the benefit of hindsight offered by the published results of studies utilizing predecessor servant leadership scales. Its principal weakness includes lack of post-publication validation studies using the scale to confirm and validate its dimensions and items, which this study will help to resolve.

### **Population and Sample**

This study examined the relationships between project members' (followers') perceptions of the servant leadership behaviors of their self-selected project manager (independent variable) and their rating of the success of the project managed by that project manager (dependent variable). The unit of measure is the project manager, each associated with a project. To obtain data about project managers and the project each led, this study solicited the perspectives of project members who have worked with a project manager, and who also provided their perceptions of the success of the project, thereby providing data for the two variables under study. These project members were asked to

self-identify a project manager and the associated project when completing the survey and providing the servant leadership and project success ratings.

Because the purpose of this study was derived from issues originating from aerospace and defense projects, which has also informed the experience and inquiry of the researcher, the targeted sample population were those project members currently active in, or having recent past participation in, an aerospace and defense project.

The global population of aerospace and defense project members are not readily identifiable, nor was the identification of an associated population of project managers. Therefore, a multistage sampling design was employed to identify the sample frame. Within the global aerospace and defense industry, the three largest non-government organizations, as measured by annual revenue, include Boeing, European Aeronautic and Space Company (EADS), and Lockheed Martin (PricewaterhouseCoopers International Limited, 2011), which respectively employ approximately 171,000, 133,000 and 123,000 persons worldwide. However, not all of these organizations' employees were involved in aerospace and defense work, nor was a head count available for those who hold the title of project manager. To further arrive at some estimate of the population of project members, another metric that may be indicative of the number of project members was the number of persons employed in the aerospace and defense industry. According to a recent study by Deloitte (2012), there were 1.05 million persons employed in the United States by aerospace and defense organizations, however, not all of these persons were members of project teams. In regard to global project manager population, one indicator is the membership count in the two dominant global project management organizations; the PMI, based in the U.S., claimed to have over 600,000 members and credential holders



(PMI, 2012), while the International Project Management Association (IPMA), headquartered in the Netherlands, is a federation organization representing some 55 non-profit member organizations, for which an aggregate membership count is not published. However, not all PMI or IPMA members work in the aerospace and defense industry. One convergent population of the two principal functional and industry elements – project management and aerospace and defense – is the PMI Aerospace and Defense Community of Practice, which is hosted as an online group on the PMI web site. Because as of June 2012 this member directory included only 195 members, it was not deemed sufficient to obtain the desired sample size for this study.

The sample size objective for this research was to obtain 110 valid responses. Because this study used non-probability sampling techniques, the degree of generalizability of results is limited. Determination of 110 for the minimum sample size was based on three determinants related to the dependent variable (project success): confidence level, allowable sampling error, and estimated population standard deviation, using a formula derived from Levine, Stephan, Krehbiel, and Berenson (2009, p. 271). This determination affects the inferential statistical analyses, and thus the generalizability of the results of the sample evaluated in this study.

Confidence level is calculated as  $(1-\alpha) \times 100\%$ , where alpha ( $\alpha$ ) is the probability of committing a Type I error, which occurs if the null hypothesis is rejected when it is true and should not be rejected. The most common risk level selected for social science studies is  $\alpha=0.05$ ; therefore, the confidence level for the present study is set at 95%.

Allowable sampling error, or what is sometimes referred to as margin of error, is subjective. A large number for the sampling error results in fewer samples required,

while achieving a smaller number requires more samples. This error reflects the differences given to chance based on the probability of including or not including particular persons in the sample, and provides a sense of precision. While there is no firm guidance for sampling error tolerance, something at or below the level of 5% corresponds to our predetermined level of confidence.

An estimated population standard deviation can be derived for the dependent variable based on data already available with the PIP (1994). Based on actual data from more than 400 projects, the expected PIP project performance factor scores will range from 21 to 84, with a mean of 64.9 and a standard deviation of 16.27.

Using the sample size determination for the mean formula in Levine, Stephan, Krehbiel, and Berenson (2009, p.271), with an aggressive 3% sampling error, and rounding down the standard deviation to 16.0, the calculation returns a sample size requirement of 110. Thus, by obtaining 110 samples, the study results can be 95% sure of obtaining results within +/- 3% of the true mean for the entire population. Accepting a sampling error of +/- 4% reduces the sample size requirement to 62, with +/- 5% reducing the sample size to 40.

### **Access to the sample population**

A common means for researchers to identify and gain access to desirable candidates and sample frames is to leverage voluntary memberships in a topically-related professional society or group such as a local professional society chapter, affiliation group, or alumni association; such groups exist both on-ground and online, and in diverse geographical locations. Researchers are no longer restricted to on-ground groups, however. With the emergence of professional social networking sites (SNS), affiliation

groups have formed as online professional and business communities of participation and have become an important part of employment participation (Baker, Briscout, Moon, Coughlan & Pater, 2013). These SNS groups form large and heterogeneous sample frames, offering an attractive array of potential respondents to allow the research effort access to a sample that is diversely represented in gender, age, experience, industry, and opinion. The LinkedIn® social networking site currently receives the tenth most web site visits in the United States as measured in volume of web traffic (Alexa, 2012) and offers access to a large population of 150 million worldwide members (LinkedIn, 2012). This SNS enables the researcher to attract voluntary participation, which allows for greater authenticity of responses (Redmond, 2010).

This study utilized a convenience sampling of the population to develop a sampling frame that provided focused data for the two variables under study. To identify project team members who were able to provide an evaluation of an aerospace and defense project manager, the LinkedIn® SNS was utilized to reach persons who are members of aerospace and defense employers and industry-affiliated LinkedIn® groups. Members of these LinkedIn® groups are current and past employees in the aerospace and defense industry, and are therefore likely have worked on aerospace and defense-related projects similar to some of those identified in this paper. A selection of aerospace and defense associated LinkedIn® groups was identified based on industry and employer affiliation on the LinkedIn® social networking web site, from which a sample population would be derived. The targeted respondents from this sample population were aerospace and defense project members, who may be employed by and work with a large number of employers in diverse organizations and locations. Selection of this sample population and

sample frame was based on the LinkedIn® group members' likely association with aerospace and defense-related projects and their ready accessibility to the researcher as a member of the selected LinkedIn® groups.

For the present study, ten aerospace and defense-related affiliation groups within the LinkedIn® social networking community were identified by the researcher as those who may possibly have some direct or indirect association with aerospace and defense projects. The ten LinkedIn® groups selected were associated with the aerospace and defense industry, or one of the major employers in that industry.

An internet-resident survey solicitation was posted on the discussion page of each of the LinkedIn® group pages. To create a snowball effect, e-mails were sent to the group owner and also to those group members who belong to the personal network of the researcher, each of whom was asked to forward the invitation to their own network contacts encouraging participation. No incentive was offered for participation. The survey would remain active on the site for at least 30 days, or until the minimum number of valid responses was obtained. Response rates from the LinkedIn® groups were anticipated to be moderate to poor (N. Azizian, personal communication, January 16, 2012; R. Baker, personal communication, April 17, 2012), however, the large sample frame and persistent communication of the solicitation was able offset a low response rate to obtain the minimum number of valid samples.

### **Procedure**

To reduce recollection error, the sample who were to provide data for analysis were intended to be persons who are or have been members of an aerospace and defense project group, and who were followers of an associated project manager within a one-

year time window. This population constituted the sample frame to provide data for the independent variables, which are the eight factors of servant leadership (Van Dierendonck & Nuijten, 2011), while also providing data for the dependent variable, which is project success (Slevin & Pinto, 1988, 1994).

The sample frame was comprised of project team members from ten aerospace and defense-related LinkedIn® groups on whose site the researcher posted an online survey. There was no incentive offered for participation. Nine of the groups were selected based on their stated LinkedIn® group profile that reflects their association with organizations, industries, or employers that are involved with aerospace and defense, and whose members may have been associated with the types of projects identified in the background of this study. The tenth group was derived from the researcher's personal LinkedIn® network, which included a substantial number of aerospace and defense industry project team members. This selectivity increased the likelihood that the group's members have been associated with an aerospace and defense project, which respondents in turn verified with one of the questions in the survey. The target population from which the sample would be drawn is shown in Figure 3.1.

An initial question of the survey was a screening question to ensure the respondent had in the past year or is currently working on an aerospace and defense project with a project leader; only those with an affirmative response to this question and who completed the remainder of the questions were considered a valid response. The additional screening question regarding project type was adopted to increase the credibility of the responses regarding the nature of the project and its applicability to aerospace and defense. The complete integrated survey is provided in Appendix E.

The ten LinkedIn® groups forming the target population are listed in Table 3.1.

Table 3.1

*LinkedIn® groups forming the target population*

<u>LinkedIn® Group</u>	<u>Population</u>
PMI Aerospace and Defense Community of Practice	3,043
Researcher Personal LinkedIn network	442
Lockheed Martin Employees	5,082
University of PA Technology Management	760
Aviation and Aerospace Professionals	60,319
Lockheed Martin Connections	9,257
Rutgers Engineering Society	933
NASA Project Management	635
Aerospace and Defense Industry Professionals	5,858
Lockheed Martin Employees Past and Present	312
TOTAL	86,641

The target population was approximately 86,000 persons, with an expected response of a minimum of 110 persons. In all cases, the principal researcher was a member of each group, which provided the requisite authority to post a survey participation request on the group web site. A posting on the LinkedIn® web site of each group was used to solicit participation (Appendix D) and direct the voluntary, self-selected participants to a researcher-controlled Survey Monkey web site. Here, prospective participants were informed of their confidentiality and anonymity (Appendix F), and where a “yes” response to a consent question directed them to the online questionnaire.

The questionnaire included three sections. Section 1 included demographic questions about the respondents and, without soliciting identification of details, a project they have worked on, and the project manager leading that project. Section 2 included 30 questions about the servant leadership behaviors of a project leader they will self-identify. Section 3 included 12 questions about the success of the project that was or is being led by project manager leading the subject project.

The sample was comprised of persons who are members of convenience sampled LinkedIn® member groups. The groups selected were commonly comprised of aerospace and defense project members, who for this study are persons who are currently or have worked on an aerospace and defense-related project. Each member of this population was asked to mentally identify for themselves (not to be provided in the response) a project and its associated project manager. Using the questions from the SLS instrument, their responses provided a servant leadership assessment of the project manager (leader) which served as the data for the independent variable (the measure of servant leadership). No project leaders themselves were surveyed, since this inquiry sought the views of the followers regarding the servant leadership behaviors of the project manager (the independent variable). The total population was reduced since only respondents who have worked with a project manager in the past year were considered valid respondents.

### **Data collection**

Following approval from the Eastern University Institutional Review Board (IRB), the survey questions shown in Appendix E were posted into an online survey using Survey Monkey web service, the costs for which were borne by the researcher. Following this, the solicitation shown in Appendix E was posted on the “Discussions” pages of each of the identified LinkedIn® groups, and was also posted to selected aerospace and defense industry contacts on the researcher’s own personal LinkedIn® network. The solicitation posting contained a hyperlink that directed voluntary participants to the Survey Monkey web page that served as the informed consent page (Appendix F). To promote visibility of the solicitation by the group members, the link was re-posted to the LinkedIn® site and forwarded to LinkedIn® contacts multiple times

during the course of the data collection in order to ensure collection of at least the minimum number of responses. Participation in the study was voluntarily. If the participant agreed to be a part of the study, the online survey would take them to the next question. If they did not agree, the survey took the respondent to an end page thank you message. The SLS and PIP surveys were provided only to those study participants who agreed to the study via the informed consent.

Upon self-selecting, the respondent was presented with several questions to provide some individual demographic information, and to identify themselves with a project manager so that SLS and PIP associations could be established. The subsequent sets of questions were derived from the two respective instruments: (a) the 30-item SLS to address the servant leader behavior of their identified project manager/leader, and (b) the 12-question PIP to address the project success factors of the associated project.

Two qualifier questions were included. The first qualifier question was: “In the most recent one year period, have you worked as part of an aerospace and defense project?” to ensure that the respondent had worked on an aerospace and defense project. The second qualifier question was: “For this project, have you worked with a project manager who was not your direct supervisor?” to ensure that the respondent had worked for a project manager who was not their direct line supervisor, thus ensuring a project manager-follower relationship that removed traditional employee incentives such as compensation, promotion, or future work assignments (Thamhain & Gemmill, 1974). Only surveys including a “yes” answer to these questions were considered valid, and invalid responses were eliminated from the data analysis.



## **CHAPTER 4**

### **ANALYSIS**

The purpose of the study was to collect quantitative data and apply statistical analysis techniques to determine the degree to which the servant leadership of behaviors of project managers in the aerospace and defense industry relates to the success of their project. The study was guided by the following research question: What is the relationship between servant leadership behaviors demonstrated by aerospace and defense project managers and the resulting success of their projects? Understanding the specific factors of the servant leadership style that may contribute to project success offers organizations the opportunity to improve project manager selection approaches and increase the probability of successful project outcomes. The findings and quantitative data and analysis provided herein answer the research question.

#### **Survey Respondents**

A total of 231 survey responses were collected on the Survey Monkey web site during the period June 23, 2012 to July 23, 2012. Responses to the survey came from ten different LinkedIn groups, with frequency and percentage of responses as reflected in Table 4.1.

Table 4.1  
*LinkedIn® Source of Responses*

	Frequency	Percentage
PMI Aerospace and Defense Community of Practice	137	59.3
Researcher Personal LinkedIn network	62	26.8
Lockheed Martin Employees	11	4.8
University of PA Technology Management	9	3.9
Aviation and Aerospace Professionals	2	0.9
Lockheed Martin Connections	2	0.9
Rutgers Engineering	1	0.4
NASA Project Management	1	0.4
Aerospace and Defense Industry Professionals	1	0.4
Lockheed Martin Employees Past and Present	1	0.4
TOTAL	231	100

The response data was downloaded into an Excel file and sorted to determine the validity of each response. Table 4.2 depicts the distribution of response validity. For the 231 responses, 115 (49.8%) were determined to be valid, meaning the respondent answered the two qualifier questions affirmatively and also provided responses for the SLS and PIP questions. This quantity of valid responses met the research requirement of at least 110 valid responses, so the survey was closed after the minimum thirty day open period.

Table 4.2  
*Distribution of Response Validity*

	Frequency	Percentage
Fully valid response	115	49.8
Not all questions answered	20	8.6
Direct supervisor project manager	23	10.0
Project more than one year ago	14	6.0
Did not answer any questions	54	23.4
Did not provide consent	5	2.2
Total	231	100

One hundred and sixteen of the 231 responses (51.2%) were determined to be invalid for several reasons. Twenty of the responses (8.7%) were determined to be invalid because not all PIP and SLS questions were answered. Twenty-three of the responses (10%) were determined to be invalid due because the respondent indicated they reported

about an A&D project manager who may have been their direct supervisor, this violating the project manager-follower relationship principle inherent in this study. Fourteen of the responses (6.1%) were determined to be invalid due because the respondent indicated they had not worked on an A&D project within the past year, thus creating concerns about recollection error. Fifty-four of the responses (23.4%) were determined to be invalid because the respondent did not answer most or even all of the questions after acknowledging the consent form. Five of the responses (2.2%) were determined to be invalid because the respondent did not accept the terms of the research as explained in the consent form.

### **Data analysis**

The data collected from the survey which incorporated screening, demographic, SLS, and PIP instruments were downloaded into Microsoft Excel and the Statistical Package for Social Sciences (SPSS) software in order to perform descriptive and inferential statistical analysis.

The survey included demographic questions to capture personal characteristics including gender, years of professional experience, education type and level, type of project, and duration of time worked with the subject project manager being evaluated. A screening question was asked to ensure that the respondent had worked on an aerospace and defense project, and to reduce recollection error, had done so within the past year. Nominal and ordinal variables collected from the demographics questions in the survey were analyzed using descriptive statistical techniques.

Interval data was collected based on the SLS responses, which determined the eight factors of servant leadership characteristics of the project managers as viewed by

their followers (the survey respondents). The eight factors of the SLS constitute the independent variables, and each was developed through multiple questions based on the number of items for that variable (see Table 4.3), with a possible values ranging from 1 to 7. A total of 30 items form the SLS scale. Interval data was collected from the PIP responses, which determined the success of the project as viewed by the followers, and formed the dependent variable, with a possible value ranging from 1 to 7. A total of ten items form the PIP scale. The intervals between each of the 7 point range of the SLS and PIP rank-ordered scales were assumed to be approximately equal for the purpose of correlation and regression analysis. Where required, data for the SLS and PIP variables were normalized in order to conduct statistical analyses.

Table 4.3  
*Independent Variables from the SLS*

Factor	Measurement Level	Items	Range / item
Empowerment	Interval	7	1 to 7
Standing Back	Interval	3	1 to 7
Accountability	Interval	3	1 to 7
Forgiveness	Interval	3	1 to 7
Courage	Interval	2	1 to 7
Authenticity	Interval	4	1 to 7
Humility	Interval	5	1 to 7
Stewardship	Interval	3	1 to 7
TOTAL number of items =		30	

To test the nature and strength of any relationship between the eight factors of the servant leadership scale and the single factor of the project success scale, two methods of determining correlation were employed. To test the relationship between the variables, Pearson's coefficient of correlation was developed, which is appropriate to test for a relationship between two continuous interval variables as a measure of linear association. Correlations between the eight factors of servant leadership and the single factor of project success were analyzed. Correlation determines "the association between two

variables and for expressing the dependence of one variable on the other” (Moore & McCabe, 1989, p. 206). A correlation matrix (Table 4.16) was prepared that included each of the eight factors of servant leadership and the single factor of project success. The significance of the correlation were measured in values ranging from -1 (inverse relationship) to 1 (direct relationship), with larger absolute values being indicative of strong relationships between variables.

Multiple linear regression (MLR) models using ordinary least squares methods were developed to test the eight null hypotheses. The linear relationships for the eight factors and 30 items of servant leadership, as they explain the single factor of project success, were analyzed. These tests identified the nature and strength of the relationship between each factor of servant leadership behavior and project success. MLR techniques are appropriate to “investigate the simultaneously the effects of several independent variables on a dependent variable” (Zikmund, Babin, Carr & Griffin, 2012, p.594), where there is a single dependent variable and two or more independent variables using interval data. From the MLR findings, an explanatory graphical correlation model among the eight factors and 30 total items of the servant leadership scale and the one factor of 12 items of the project success scale were developed, providing indication of direction and strength of the relationships.

All inferential statistical tests were conducted using a 0.05 level of significance at a confidence level of 95%.

### **Descriptive statistics of the sample demographics**

Demographic questions were posed to the respondents in order to understand and characterize the demographics of the sample, and to collect information that might be

useful for future studies using this data set. The results of these data were not incorporated as part of the primary research question, nor were they used to draw conclusions related to the research question and hypotheses. However, these data yield some interesting and possibly useful insights for the development of future research. A summary of the results for each demographic question is provided herein, along with some analysis and findings that are not intended to infer statistically significant associations or conclusions.

The respondents were asked to provide some demographic descriptors about themselves, which yielded the following from among the valid respondents, as provided in Table 4.4. Among valid respondents, the reported organizational level was 11 executive (9.5%), 59 senior (51.3%), 34 mid-level (29.6%), and 3 retired (2.6%). Among reporting and non-retired respondents, those at higher organizational levels reported higher project success scores, with executives reporting 10% higher on average than mid-level respondents. For selected servant leadership variables, this same group reported five of the eight SLS variables, including empowerment, humility, authenticity, courage, and stewardship as increasing, on average, as the organizational level escalated. In each case, executives reported from 1% to 10% higher scores than both senior and mid-level respondents.

Table 4.4  
*Organizational level reported by valid respondents*

	Frequency	Percentage
Executive	11	9.5
Senior	59	51.3
Mid-level	34	29.6
Retired	3	2.6
Not reported	8	7.0
Total	115	100

Among valid respondents, the reported highest post-secondary degree attained was 28 bachelor's degree (24.3%), 68 master's degree (59.1%), 5 doctorate (4.3%), and 8 no college degree (6.9%), as listed in Table 4.5. Among respondents and the servant leadership variables reported, only one variable (standing back) resulted in a discernible pattern, with increasing degree levels corresponding to decreasing scores; doctoral respondents rated their project managers' standing back qualities an average of 13.1% lower than those with no college degree.

Table 4.5  
*Highest academic degree reported by valid respondents*

	Frequency	Percentage
Bachelor	28	24.3
Masters	69	60.0
Doctorate	5	4.4
No college degree	8	6.9
Not reported	5	4.4
Total	115	100

Among valid respondents, the reported degree types reported (multiple selections allowed), included 76 with business degrees, 102 with engineering degrees, 12 with arts and sciences degrees, and 11 with computer science degrees, as shown in Table 4.6. Respondents with engineering or both engineering and business degrees reported, on average, 6.4% higher project success scores than those with either only business or arts and science degrees. For respondents with only engineering degrees, the servant leadership variables of empowerment, accountability, and courage of the project managers were reported higher than those with other degree types. For respondents with only business degrees, the servant leadership variables of standing back, humility, and forgiveness were reported higher than those with other degree types. Respondents with arts and sciences degrees reported the lowest average scores for project success and seven

of the eight servant leadership variables, with standing back as the lone exception which was only 0.5% lower than the next lowest group.

Table 4.6

*Type of college degree reported by valid respondents (multiple responses allowed)*

Type of degree	Frequency
Engineering	102
Business	76
Arts and Sciences	12
Computer Science	11
Classified	26

Among valid respondents, the reported , years of professional experience reported included 1 person with 0-5 years (0.08%), 6 persons with 5-10 years (5.2%), 27 persons with 10-15 years (23.5%), 11 persons with 15-20 (9.6%), 12 persons with 20-25 years (10.4%), 43 persons with 25-30 years (37.4%), and 22 persons with more than 30 years of professional experience (19.1%), as shown in Table 4.7. Respondents with 20-25 years and 30 or more years of experience consistently reported the highest average scores for project success and seven of the eight servant leadership variables (courage being the lone exception), in each case with averages at least 10% higher than all other experience groups. The 25-30 year experience bracket between these two groups was adequately represented in the sample, but was not similarly consistent in reported levels, thereby preventing the conclusion that increasing years of experience tended to correlate to increased scores for project success and project manager servant leadership behaviors. Future studies may seek to consider years of experience, and its natural association with age, as a variable in how servant leadership qualities are viewed by followers.



Table 4.7

*Years of professional experience reported by valid respondents*

	Frequency	Percentage
0 – 5 years	1	0.08
5 – 10 years	6	5.2
10 – 15 years	26	23.5
15 – 20 years	11	9.6
20 – 25 years	18	10.4
25 – 30 years	25	37.4
30 or more years	21	19.1
Not reported	7	

The respondents were asked to identify the type of aerospace and defense project for which they provided ratings about the project manager and the project success. Pre-defined categories were provided in the survey, and write in options were permitted. Multiple selections were allowed, because projects may have included multiple category types, therefore there were more project types identified than the number of respondents. From among valid respondents (n=115), the types of projects for which respondents provided success ratings (PIP) included software (60), hardware (61), space (15), classified (26), electronics (30), aviation (35), information technology (1), shipbuilding (16), engineering models (1), military vehicles (1), flight simulators (1), environmental cleanup (1), systems engineering (1), and none of the above (3) (see Table 4.8). Few patterns emerged in ratings according to project type, with mostly tight clustering for the reported variable values. Among the outliers were space projects reporting more than 15% higher than the mean for the accountability servant leadership variable, and shipbuilding reporting more than 10% higher than the mean for the courage servant leadership variable. Future studies directed toward the aerospace and defense industry might consider this variable of project type, and associated complexity, as a variable in how servant leadership qualities are viewed by followers, and how these relate to the success of the related project.

Table 4.8

*Types of projects reported by valid respondents (multiple responses allowed)*

	Frequency
Hardware	61
Software	59
Integrated systems	46
Aviation	34
Electronics	30
Classified	26
Shipbuilding	16
Space	15
None of the above	3
Information Technology	1
Military Vehicles	1
Flight simulators	1
Environmental cleanup	1
Systems Engineering	1
Engineering models	1

The respondents were asked to identify how long, in years, they had/have worked with the project manager for whom they provided servant leadership ratings using the SLS. From among valid respondents, the time that the follower (respondent) reported as having worked with the leader (project manager) ranged from 0 to 1 years (26, 22.6%), 1 to 2 years (30, 26.1%), 2 to 3 years (18, 15.7%), and 3 or more years (41, 35.7%). The respondent ratings for project success and five of the eight project manager servant leadership qualities reflected the highest average scores by 2-10% margins for those respondents who had worked the lengthiest period of time (three or more years) with the evaluated project manager; these included the servant leadership qualities of empowerment, humility, authenticity, courage, and stewardship. Future studies may seek to consider this variable of time having worked with the project manager as leader as a variable in how servant leadership qualities are viewed by followers, or even conduct a longitudinal study to see how those views may change over time.

Table 4.9

*Period of time having worked with evaluated project manager*

	Frequency	Percentage
0 – 1 years	26	22.6
1 – 2 years	30	26.1
2 – 3 years	18	15.7
3 or more years	41	35.7

The respondents were asked to identify the gender of the project manager for whom they worked, and for whom they provided servant leadership ratings using the SLS. From among valid respondents, their project managers evaluated were 105 male (91.3%) and 10 female (8.7%). Respondents were not asked to identify their own gender. While the sample size of female project managers being rated was significantly fewer than males, the respondent ratings for females were higher for all nine variables (one for project success and eight for servant leadership). These higher ratings ranged from 7.3% project success, with servant leadership qualities ranging from 7.8% to 23.3% higher for female project managers than male project managers, with three variables – empowerment, standing back, and courage – having more than 20%+ higher ratings. These distinctions may be worthy of future study to determine if female project managers are more likely to demonstrate servant leadership behaviors (and which ones, if so), and if as a result female project managers are more likely to achieve higher project success ratings.

#### **Descriptive statistics for the PIP**

The PIP includes 12 questions that, when summed, represent the respondents' views of the success of their reported project. Each question response is on a 1 to 7 point Likert scale, and is equally weighted. The minimum summed PIP score is 12, and the maximum summed PIP score is 84. According to Slevin and Pinto (1994), summed

scores can be ranked against a baseline data set of 409 projects, and converted to a percentile score as compared to the baseline data, and assigned to a category that depicts the general health of the project. A PIP summary score of 12 to 70 translates to a project in critical condition, a score of 71 to 75 translates to a project in fair condition, and a score of 76 to 84 translates to a project in good condition (Table 4.10). The 115 respondents in the present study reported 15 projects in good condition, 18 projects in fair condition, and 82 projects in critical condition. On a summary basis, the mean project score for all 115 projects was 61.3, which translates to critical, with a standard deviation of 13.2, which reflects a relatively small variation in this sample (Table 4.11). The study did not incorporate the PIP health category into the analysis, instead relying upon the relative values of summed response. When transformed into a common 1-to-7 scale, the mean PIP score was 5.11, with a standard deviation of 1.1. The ratios between the transformed scores are equivalent.

Table 4.10

*Descriptive statistics for PIP scores from valid respondents (all projects, frequency distribution)*

	Frequency	Percentage
Good condition	15	13.0
Fair condition	18	15.7
Critical condition	82	71.3

Table 4.11

*Descriptive statistics for summary PIP scores from valid respondents (all projects, summary basis)*

	Max Score	Min Score	Mean	Std dev
All projects	84	12	61.3	13.2

### **Descriptive statistics for the SLS**

The SLS includes 30 questions that are organized into eight factors (listed in Table 4.12). Each factor, when calculated, represents the respondents' views about

certain servant leadership behaviors (e.g. empowerment, courage, etc) exhibited by the project manager for whom they reported. Each question response was on a 1 to 7 point Likert scale, and the number of dimensions for each factor varied from two to seven, therefore the minimum and maximum factor scores varied according to how many dimensions correspond to each factor.

Descriptive SLS results from the 115 valid respondents are provided in Table 4.12. By themselves, the mean scores are not highly meaningful, except on an individual basis for each evaluated project manager, who might use the scoring to identify servant leadership style strengths and weaknesses. With the exception of the forgiveness factor, whose scale is inversed from the other 27 questions, SLS questions are positively phrased, meaning that high scores indicate high opinion. For the forgiveness factor, which is negatively worded, scores were reversed from the 1 to 7 scale so that all factors would be compared on the same basis. The maximum, minimum, and mean scores for each factor are shown in Table 4.12. However, since the maximum scores vary, a better comparison requires transforming these results into a common scale. After converting the scores for each factor into a normalized zero-to-100 point linear percentile scale, the results show a distinct and differentiated tendency for respondents to have noted high measures of accountability among the project managers (92.4% rating), with the remaining seven factors not well differentiated and tightly clustered around the 66<sup>th</sup> to 72<sup>nd</sup> percentile range.

Table 4.12

*Descriptive statistics for SLS scores from valid respondents (n=115) (by factor, normalized high to low, summary for all valid respondents)*

Factor	Max Score	Min Score	Mean Score	Normalized
Accountability	21	3	16.64	92.4
Stewardship	21	3	13.03	72.4
Empowerment	49	7	30.24	72.0
Courage	14	2	8.57	71.4
Authenticity	28	4	16.49	68.7
Humility	35	5	20.37	67.9
Standing back	21	3	12.17	67.6
Forgiveness	21	3	11.96	66.4

### Testing of Hypotheses

The nine null hypotheses presented in the present study were evaluated to test the relationship of each of the eight factors of servant leadership defined by Van Dierendonck and Nuijten (2011) in the SLS and their relationship to project success as defined by Slevin and Pinto (1994) in the PIP. In testing the first eight null hypotheses, correlation statistical techniques were applied to investigate the strength and direction (positive or negative) of the relationship between the SLS factors (independent variable) and the PIP scores (dependent variable). In testing for the ninth null hypotheses, multiple linear regression (MLR) techniques were applied. The data for the eight SLS factors and the summed PIP scores were normalized to a 1 to 7 scale, and consistency of ratios was validated in order to ensure accurate scale comparison. Using SPSS, the Pearson's product moment correlation statistic (the "r" value) was obtained, along with a level of statistical significance. It is important to note that correlation does not explain causality, which would require future research. Table 4.13 shows the calculated correlation coefficients between and among the eight factors of servant leadership behavior and the single factor of project success. All correlations were determined to be statistically significant (seven variables at the 0.01 level, the eighth variable – courage - at the 0.05

level). The strength of the relationship between the two variables was characterized into one of three brackets, based on the guidelines from Cohen (1988, pp. 79-81), where small describes  $r$  values from 0.10 to 0.29, medium describes  $r$  values from 0.30 to 0.49, and large describes  $r$  values from 0.5 to 1.0.

### **Relationship between Empowerment and Project Success**

The relationship between empowerment (independent variable as measured by the SLS) and project success (dependent variable as measured by the PIP) was investigated using SPSS to calculate the Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The Pearson product-moment correlation coefficient was calculated (see Table 4.13), which showed a large, positive correlation between the two variables ( $r = 0.572$ ),  $n = 115$ ,  $p < .01$ , with high levels of empowerment strongly associated with high levels of project success.

In terms of goodness of fit of the regression line, the coefficient of determination ( $r^2$ ) is calculated to be 0.327 (see Table 4.14), which means that empowerment explains 32.7% of the variance in project success, which is a very respectable amount of explained variance.

The null hypothesis  $H_{01}$  was rejected for empowerment relative to project success based on the analysis demonstrating a positive and strong correlation between these two variables.

### **Relationship between Standing Back and Project Success**

The relationship between standing back (independent variable as measured by the SLS) and project success (dependent variable as measured by the PIP) was investigated

using SPSS to calculate the Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions or normality, linearity, and homoscedasticity. The Pearson product-moment correlation coefficient was calculated (see Table 4.13), which showed a medium, positive correlation between the two variables ( $r = 0.381$ ),  $n = 115$ ,  $p < .01$ , with higher levels of standing back moderately associated with high levels of project success.

In terms of goodness of fit of the regression line, the coefficient of determination ( $r^2$ ) is calculated to be 0.107 (see Table 4.14), which means that standing back explains 10.7% of the variance in project success, which is a moderate amount of explained variance.

The null hypothesis  $H_{02}$  was rejected for standing back relative to project success based on the analysis demonstrating a positive and medium correlation between these two variables.

### **Relationship between Accountability and Project Success**

The relationship between accountability (independent variable as measured by the SLS) and project success (dependent variable as measured by the PIP) was investigated using SPSS to calculate the Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions or normality, linearity, and homoscedasticity. The Pearson product-moment correlation coefficient was calculated (see Table 4.13), which showed a medium, positive correlation between the two variables ( $r = 0.352$ ),  $n = 115$ ,  $p < .01$ , with higher levels of accountability moderately associated with high levels of project success.



In terms of goodness of fit of the regression line, the coefficient of determination ( $r^2$ ) is calculated to be 0.124 (see Table 4.14), which means that accountability explains 12.4% of the variance in project success, which is a moderate amount of explained variance.

The null hypothesis  $H_{03}$  was rejected for accountability relative to project success based on the analysis demonstrating a positive and medium correlation between these two variables.

### **Relationship between Forgiveness and Project Success**

The relationship between forgiveness (independent variable as measured by the SLS) and project success (dependent variable as measured by the PIP) was investigated using SPSS to calculate the Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions or normality, linearity, and homoscedasticity. The Pearson product-moment correlation coefficient was calculated (see Table 4.13), which showed a small, positive correlation between the two variables ( $r = 0.263$ ),  $n = 115$ ,  $p < .01$ , with higher levels of forgiveness only modestly associated with high levels of project success.

In terms of goodness of fit of the regression line, the coefficient of determination ( $r^2$ ) is calculated to be 0.069 (see Table 4.14), which means that forgiveness explains 6.9% of the variance in project success, which is a modest amount of explained variance.

The null hypothesis  $H_{04}$  was rejected for forgiveness relative to project success based on the analysis demonstrating a positive and small correlation between these two variables.

### **Relationship between Courage and Project Success**

The relationship between courage (independent variable as measured by the SLS) and project success (dependent variable as measured by the PIP) was investigated using SPSS to calculate the Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions or normality, linearity, and homoscedasticity. The Pearson product-moment correlation coefficient was calculated (see Table 4.13), which showed a small, positive correlation between the two variables ( $r = 0.206$ ),  $n = 115$ ,  $p < 0.05$ , with higher levels of courage weakly associated with high levels of project success.

In terms of goodness of fit of the regression line, the coefficient of determination ( $r^2$ ) is calculated to be 0.042 (see Table 4.14), which means that courage explains 4.2% of the variance in project success, which is a very limited amount of explained variance.

The null hypothesis  $H_{05}$  was rejected for courage relative to project success based on the analysis demonstrating a positive and small correlation between these two variables.

### **Relationship between Authenticity and Project Success**

The relationship between authenticity (independent variable as measured by the SLS) and project success (dependent variable as measured by the PIP) was investigated using SPSS to calculate the Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions or normality, linearity, and homoscedasticity. The Pearson product-moment correlation coefficient was calculated (see Table 4.13), which showed a large, positive correlation between the two

variables ( $r = 0.499$ ),  $n = 115$ ,  $p < .01$ , with higher levels of authenticity strongly associated with high levels of project success.

In terms of goodness of fit of the regression line, the coefficient of determination ( $r^2$ ) is calculated to be 0.249 (see Table 4.14), which means that courage explains 24.9% of the variance in project success, which is a very respectable amount of explained variance.

The null hypothesis  $H_{06}$  was rejected for authenticity relative to project success based on the analysis demonstrating a positive and large correlation between these two variables.

### **Relationship between Humility and Project Success**

The relationship between humility (independent variable as measured by the SLS) and project success (dependent variable as measured by the PIP) was investigated using SPSS to calculate the Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The Pearson product-moment correlation coefficient was calculated (see Table 4.13), which showed a medium-to-large, positive correlation between the two variables ( $r = 0.485$ ),  $n = 115$ ,  $p < .01$ , with higher levels of humility moderately-to-strongly associated with high levels of project success.

In terms of goodness of fit of the regression line, the coefficient of determination ( $r^2$ ) is calculated to be 0.235 (see Table 4.14), which means that humility explains 23.5% of the variance in project success, which is a very respectable amount of explained variance.

The null hypothesis  $H_{07}$  was rejected for humility relative to project success based on the analysis demonstrating a positive and medium correlation between these two variables.

### **Relationship between Stewardship and Project Success**

The relationship between stewardship (independent variable as measured by the SLS) and project success (dependent variable as measured by the PIP) was investigated using SPSS to calculate the Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The Pearson product-moment correlation coefficient was calculated (see Table 4.13), which showed a medium, positive correlation between the two variables ( $r = 0.429$ ),  $n = 115$ ,  $p < .01$ , with higher levels of stewardship moderately associated with high levels of project success.

In terms of goodness of fit of the regression line, the coefficient of determination ( $r^2$ ) is calculated to be 0.184 (see Table 4.14), which means that stewardship explains 18.4% of the variance in project success, which is a respectable amount of explained variance.

The null hypothesis  $H_{08}$  was rejected for stewardship relative to project success based on the analysis demonstrating a positive and medium correlation between these two variables.

Table 4.13

*Pearson product-moment correlations between the eight factors of servant leadership behavior and project success*

Factor	1	2	3	4	5	6	7	8	9
1. Project Success	1.000	.572**	.352**	.381**	.485**	.499**	.206*	.263**	.429**
2. Empowerment		1.000	.415**	.698**	.783**	.705**	.390**	.473**	.784**
3. Accountability			1.000	.225**	.255**	.375**	.341**	-.239**	.436**
4. Standing Back				1.000	.718**	.580**	.150**	.554**	.642**
5. Humility					1.000	.649**	.249**	.620**	.704**
6. Authenticity						1.000	.406**	.285**	.727**
7. Courage							1.000	.313**	.392**
8. Forgiveness								1.000	.357**
9. Stewardship									1.000

\*\*p < .01 (2-tailed), \*p < .05 (2-tailed)

Table 4.14

*Coefficient of determination results for the eight factors of servant leadership behavior in explaining variance in project success (rank order, high to low)*

SLS Factor	Coefficient of determination
Empowerment	.327
Authenticity	.249
Humility	.235
Stewardship	.184
Accountability	.124
Standing Back	.107
Forgiveness	.069
Courage	.042

### Multiple Linear Regression

To further explain the nature of the SLS-PIP relationship and test for null hypothesis nine, MLR techniques using ordinary least squares were applied. The results indicate how well the MLR model predicts project success, and explain how much of the variance in PIP scores can be explained by each of the eight SLS factors. MLR can be used to assess the predictive power of the SLS factors and assess the relative contribution of each individual factor. For the present study, MLR addressed two questions: (1) how well do the eight factors of servant leadership predict project success, and (2) which of the eight factors of servant leadership is the best predictor of project success?

MLR includes many assumptions that must be checked to ensure the validity of the utilized model. Using standard MLR techniques in the SPSS package, all of the eight independent variables (SLS factors) were entered into the model at once, with assumption verification results as follows.

Correlations between the dependent variable and the independent variables in the model ranged in all positive values from a low of 0.206 to a high of 0.499 (see Table 4.1), and were all statistically significant. The existence of good correlations with all being statistically significant is a sound result for MLR assumptions. Correlations between the eight independent variables ranged in absolute values from a low of 0.030, which is desirably low, to a high of 0.784, which is moderately high and less desirable. However, any possible concerns about undesirable multicollinearity were assuaged with the collinearity diagnostics. Tolerance is an indicator of how much variability of the given independent variable is not explained by the other independent variables. If this value is very small (less than 0.10), this indicates that multiple correlation with the other variables is high, indicating the possibility of multicollinearity. Likewise, the variance inflation factor (VIF) is the inverse of the tolerance statistic, and any value higher than 10 would be a cause for multicollinearity concern. For this study, the VIF and tolerance statistics (see Table 4.15) showed tolerance values ranging from 0.239 to 0.737, and VIF values ranging from 1.41 to 4.18. This is therefore a sound result for MLR assumptions, and all of the variables were therefore retained for the MLR model.

Table 4.15

*Variance inflation factor (VIF) and tolerance values for independent variables (rank order, high to low VIF)*

Independent Variable	tolerance	VIF
Empowerment	.239	4.179
Humility	.260	3.852
Stewardship	.294	3.396
Standing Back	.383	2.612
Authenticity	.385	2.596
Forgiveness	.522	1.914
Accountability	.711	1.406
Courage	.737	1.357

Additional assumptions included the existence and effect of outliers, and the normality, homoscedasticity, linearity and independence of residuals for each independent variable. These were evaluated using the normal probability plot of the regression standardized residual (Figure 4.1), and the associated scatterplot (Figure 4.2). The Figure 4.1 normal probability plot shows all data points in a reasonably straight diagonal line from lower left to upper right, thus indicating no major deviations from normality. The Figure 4.2 scatterplot shows the residuals in a roughly rectangular distribution, with greatest concentration in the center where the zero axes cross. Because there is no other systematic pattern (e.g. curvilinear, concentration in one quadrant or another), MLR assumptions have been maintained.

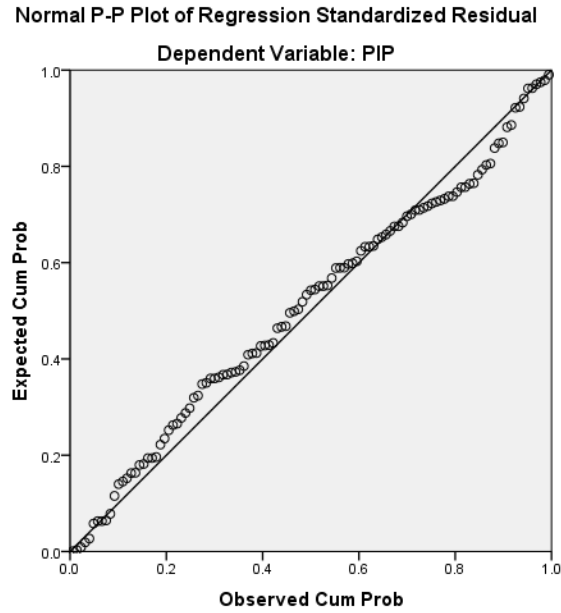


Figure 4.1. Normal probability plot of the regression standardized residual

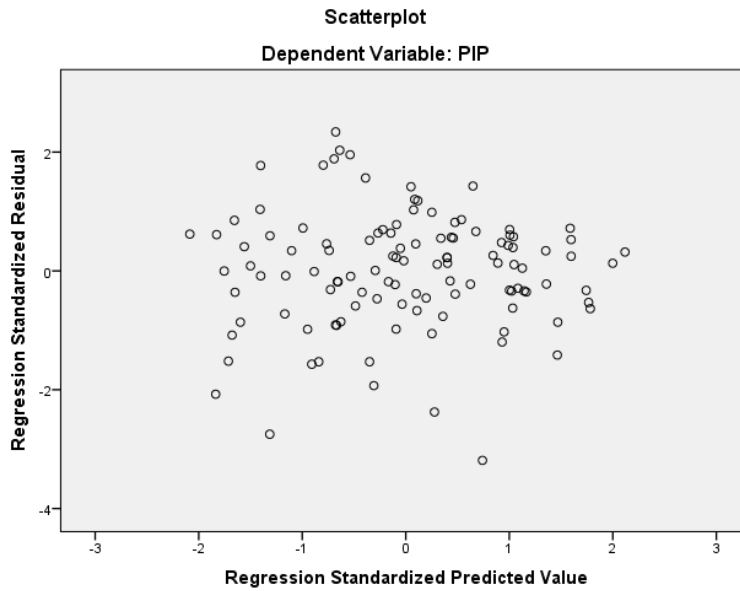


Figure 4.2. Scatterplot of the regression standardized residual

After verifying the requisite MLR assumptions, which did not require any adjustments to the model, results were evaluated. The R value measures the correlation



between the predicted and observed values of the independent variables, for which SPSS returned a value of 0.617, which is needed to develop the more meaningful R squared value of 0.381. This indicates how much of the variance in PIP (the dependent variable) is explained by the model, which includes all eight of the SLS independent variables as predictors. Expressed as a percentage, this value means that this model explains 38.1% of the variance in project success (PIP score). This degree of explained variance indicates that this MLR model demonstrates good strength of association between PIP and SLS. SPSS also tests the statistical significance of the model, with a returned significance value of 0.000, translated in practical terms to  $p < 0.0005$ , which means this model reached statistical significance. In addressing the MLR question, how well do the eight factors of servant leadership predict project success, this model provides an affirmative answer – the eight SLS factors do acceptably predict project success.

Addressing an additional MLR question, which of the eight factors of servant leadership is the best predictor of project success, requires an evaluation of the eight independent variables. Answering this question requires comparison of the contribution of each independent variable to the regression model. SPSS reports this as the beta standardized coefficient value, which are listed in Table 4.16. In this case, empowerment clearly makes the strongest unique contribution to explaining project success, when controlling for the variance explained by the other variables.

Reviewing the significance values in Table 4.16 indicates whether or not the variable makes a statistically significant unique contribution to the MLR model, and reflects the degree of overlap among the independent variables. If this value is less than 0.05, then the variable contributes a significant unique contribution to the prediction of

project success. If this value is greater than 0.05, the variable does not make a significant unique contribution to the prediction of project success. Using this criterion, only empowerment and authenticity make unique, statistically significant contributions to this model's prediction of project success, though accountability is very near to the generalized threshold.

Table 4.16

*Standardized coefficient beta values and significance for SPS variables (absolute beta value rank order, high to low)*

Independent Variable	beta value	significance
Empowerment	.466	.004
Authenticity	.247	.048
Stewardship	-.201	.157
Accountability	.169	.065
Humility	.125	.406
Standing Back	-.092	.460
Courage	-.074	.406
Forgiveness	.029	.786

### Summary of findings

The purpose of the study was to collect quantitative data and apply statistical analysis techniques to determine the degree to which the servant leadership of behaviors of project managers in the aerospace and defense industry relates to the success of their project. The principal research question was investigated: What is the relationship between servant leadership behaviors demonstrated by aerospace and defense project managers and the success of their project? This study addressed the degree to which a project manager, in a leadership role on an aerospace and defense project, exhibited the behaviors of a servant leader, and how that related to the success of his/her project.

This chapter presented the data analysis and findings of the study and addressed the research question and null hypotheses, with the following results.

Null hypothesis 1 was rejected, and the results showed that empowerment has a large and positive correlation to project success.

Null hypothesis 2 was rejected, and the results showed that standing back has a medium and positive correlation to project success.

Null hypothesis was rejected, and the results showed that accountability has a medium and positive correlation to project success.

Null hypothesis was rejected, and the results showed that forgiveness has a small and positive correlation to project success.

Null hypothesis 5 was rejected, and the results showed that courage has small and positive correlation to project success.

Null hypothesis 6 was rejected, and the results showed that authenticity has a large and positive correlation to project success.

Null hypothesis 7 was rejected, and the results showed that humility has a medium and positive correlation to project success.

Null hypothesis 8 was rejected, and the results showed that stewardship has a medium and positive correlation to project success.

Null hypothesis 9 was rejected, and the MLR results confirmed the correlation findings and showed that for the collected data set of 115 cases, a regression model based on the SLS could be created that explains a very acceptable portion of the variance in project success (38.1%). In addition, the SLS factors of empowerment and authenticity were demonstrated to be unique and statistically significant predictors of project success.

Chapter 5 discusses the research findings and their implications, limitations, as well as recommendations for future research.

## CHAPTER 5

### DISCUSSION

Recent research has shown that leadership is an important component of project management (Anantatmula, 2010; Geoghegan & Dulewicz, 2008; Keller, 2008; Muller & Turner, 2010; Nixon, Harrington, & Parker, 2012; Project Management Institute, 2008; Standish Group International, 2001; Turner & Muller, 2005). The present study described an evaluation of servant leadership behaviors of a limited number of anonymous project managers in the aerospace and defense industry, and explored the relationship of those behaviors to the success of a project led by that project manager. Seeking to extend the literature and body of knowledge for servant leadership into the under-explored application of project managers as leaders (Muller, Geraldi & Turner, 2011), this study also sought to understand if the servant leadership style could be a successful project management model in the aerospace and defense industry, where leadership and organization structures are commonly hierarchical and rigid (Brown, Potoski & VanSlyke, 2008; Thamhain, 2008) and where significant and costly failures were often attributable in part to breakdowns in leadership (Brown, Potoski, & VanSlyke, 2008; Columbia Accident Investigation Board, 2003; Sauser, Reilly, & Shenhar, 2009; Standish Group International, 1995; U.S. Department of Homeland Security, 2007). The theoretical framework and scales to measure these variables in the study were both durable and proven for the project success construct as the dependent variable (Pinto & Slevin, 1988, 1994) and a relatively new and emergent model for servant leadership with eight independent variables (Van Dierendonck & Nuijten, 2011).

The study collected quantitative survey data from a sample of 115 project team members from the aerospace and defense industry that completed a 30-item evaluation of the servant leadership behaviors of project managers with whom they had worked within the past year; these comprised the eight servant leadership independent variables. The same respondents also provided a 12-point quantitative evaluation of the success of the project led by that same project manager, which comprised the project success dependent variable. The survey included additional demographic questions.

The study was guided by the principal research question: What is the relationship between servant leadership behaviors demonstrated by aerospace and defense project managers and the resulting success of their projects? The research question studied if a project manager, in leadership role on an aerospace and defense project, exhibited the behaviors of a servant leader, and then determined if that behavior related positively, negatively, or not at all upon the success of the associated project. The research also sought to identify how well the eight factors of servant leadership (Van Dierendonck & Nuijten, 2011) predicted project success (Pinto & Slevin, 1988, 1994), and which of the eight factors of servant leadership were the best predictors of project success. Nine hypotheses were established to address the research question and objectives. The results and findings were considered and interpreted against the servant leadership literature.

### **Results and Findings**

The results for this study of 115 cases from the aerospace and defense industry were clear and conclusive; higher levels of servant leadership behaviors were shown to be associated with higher levels of project success, and lower levels of servant leadership behaviors were shown to be associated with lower levels of project success. Such

associations to servant leadership behaviors, however, do not fully explain causality for project success; additional research would be required to incorporate other confounding variables that might explain project success, such as sufficient budget, schedule, talented personnel, and other resources.

While the strength of the association with project success varied among the eight servant leadership variables in the development of Pearson product moment correlations, all eight factors of servant leadership as defined by the SLS scale – empowerment, standing back, accountability, forgiveness, courage, authenticity, humility and stewardship – were shown to have positive and statistically significant correlations to the corresponding success of the project as measured by the PIP scale. These results support prior studies that technical and managerial competencies of the project manager as leader are insufficient by themselves to predict project success (Amason, et al., 2007; Hartman & Ashrafi, 2002; Hauschildt, Gesche, & Medcof, 2000; Standish Group International, 2001; Thoms & Pinto, 1999; Turner & Muller, 2005) and that leadership matters in the success or failure of projects. The study also extended the PMI's research into the effect of the project manager as a contributor to project success (Turner & Muller, 2006) which included consideration of the personal characteristics of the project leader, by demonstrating that SLS elements such as authenticity, humility, and courage as personal characteristics are positively related to project success.

The multiple linear regression model developed in the study demonstrated that the eight SLS factors acceptably predict project success, providing explanation for 38.1% of the variance in project success (PIP score). This degree of explained variance indicates that this MLR model demonstrates good strength of association between PIP and SLS,

and the model also reached statistical significance. In addressing the question of how well the eight factors of servant leadership predicted project success, this model provided an affirmative answer – the eight SLS factors do acceptably predict project success.

A significant and important theoretical contribution of the study showed that two of the eight servant leadership factors (empowerment and authenticity) were statistically significant predictors of project success, as reflected in the developed multiple linear regression model. These servant leadership concepts of empowerment as commitment to the growth of people and authenticity as part of moral authority were presented in the literature review (Graham, 1991; Greenleaf, 1977; Spears, 1995, 1996). Because respondents reported these factors of empowerment and authenticity as being significant predictors of success for their projects, servant leadership is therefore shown as a model that could contribute to overcoming some of the leadership issues faced by aerospace and defense projects, which in the case of several high-visibility failures, lacked principled, people-centered leadership, failures to encourage, care, or listen to followers, and clear leader-follower accountability (Sausser, Reilly, & Shenhar, 2009; United States Government Accountability Office, 2010). These two factors are next examined in detail.

Because leadership bears upon the success or failure of projects, research in recent years has escalated in the study of leadership practices and styles in projects (Gehring, 2007; Keller, 2008; Krahn, 2006; Lindgren & Packendorff, 2009; Shi & Chen, 2006). However, servant leadership theory has not yet been fully examined in the project management context, and the present study therefore begins to close this gap in the literature, and demonstrates the existence of varied degrees of positive statistical

relationships between the servant leadership behaviors demonstrated by project managers and the success of their projects.

### **Servant Leadership Meaning and Implications**

The study advanced the servant leadership body of knowledge by using different approaches to examine and analyze the relationship between servant leadership and project management, previously researched by Thompson (2010). The study contributed to the development of servant leadership theory through the use of the SLS (Van Dierendonck & Nuijten, 2011) by introducing additional data to develop the SLS reliability and validity. By extending the sampling and application of the SLS instrument to a new industry (aerospace and defense) and a new leadership function (project management), the study results have demonstrated the potential application of servant leadership as a valid leadership approach for improving outcomes of projects. The resulting implications for servant leadership measurement and theory are considered as follows.

All eight dimensions of servant leadership as measured by the SLS (Van Dierendonck & Nuijten, 2011) were shown to have positive and statistically significant correlations to project success. The findings for each dimension are examined here, with integration to the existing literature for the detailed, specific items of the empowerment and authenticity factors that were shown in the MLR model to be significant predictors of project success.

#### **Empowerment**

The SLS includes seven items or questions to measure empowerment (Appendix B, Appendix E survey, questions 7,8,9,10,18, 26 and 33). The empowerment factor as



comprised of these seven items stood out from the other factors by having the largest correlation to project success (0.572 versus the next largest at 0.499), and by having the highest beta coefficient that explains the variation in the project success rating (0.466 versus the next highest at 0.247). Empowerment had the largest correlation to project success (0.572) as developed in the Pearson product-moment correlation calculation, meaning that higher empowerment ratings of the project manager were strongly associated with higher ratings for project success. Using MLR techniques to compare the unique contribution of each independent variable to the regression model (the beta standardized coefficient value, see Table 4.16), empowerment made the strongest significant unique contribution (0.466) to explaining project success, when controlling for the variance explained by the other variables. The results of the study clearly demonstrate that the 115 valid respondents experienced empowerment as demonstrated by the project manager as an important factor toward achieving project success. Because of the strength of these statistical results, the seven empowerment items in the SLS construct are explicated and considered vis-à-vis the servant leadership literature.

The seven items of the empowerment SLS construct ask if, (1) the manager (leader) gives the member the information they need to do their work well (Appendix E survey, question 7); (2) the manager (leader) encourages the member to use their talents (Appendix E survey, question 8), (3) the manager (leader) helps the member to develop themselves (Appendix E survey, question 9), (4) the manager (leader) encourages his or her staff to come up with new ideas (Appendix E survey, question 10), (5) the manager (leader) gives the member the authority to take decisions which make their work easier (Appendix E survey, question 18), (6) the manager (leader) enables the member to solve

problems by themselves instead of just telling them what to do (Appendix E survey, question 26), and (7) the manager (leader) offers the member abundant opportunities to learn new skills (Appendix E survey, question 33).

The findings from the study that result in high ratings for empowerment clearly support the literature, since development of followers is an essential component of the Greenleaf (1977) servant leadership model subsequently endorsed by other servant leadership researchers (Laub, 1999; Spears, 1995, 1996). It supports Greenleaf's notion (Spears, 1995) of commitment to the growth of people, by nurturing the personal, professional, and spiritual growth of followers.

### **Authenticity**

The SLS includes four items or questions to measure authenticity (Appendix B, Appendix E survey, questions 15, 23, 30 and 34). Authenticity had the second largest correlation to project success (0.499) as developed in the Pearson product-moment correlation calculation, meaning that higher authenticity ratings of the project manager were strongly associated with higher ratings for project success. Using MLR techniques to compare the unique contribution of each independent variable to the regression model (the beta standardized coefficient value, see Table 4.16), authenticity made the second most significant unique contribution (0.247) to explaining project success, when controlling for the variance explained by the other variables. Because of the strength of these statistical results, the four authenticity items in the SLS construct are explicated and considered vis-à-vis the servant leadership literature.

The four items of the authenticity construct ask if, (1) the manager (leader) is open about his or her limitations and weaknesses (Appendix E survey, question 15), (2)

the manager (leader) is often touched by the things he or she sees happening around them (Appendix E survey, question 23), (3) the manager (leader) is prepared to express his or her feelings even if this may have undesirable consequences (Appendix E survey, question 30) and (4) the manager (leader) shows his or her true feelings to his or her staff (Appendix E survey, question 34). These items as definitional elements of the SLS authenticity variable support and enable the building of moral authority that is foundational to servant leadership (Covey, 2002; Graham, 1991; Greenleaf, 1977; Sendjaya & Sarros, 2002; Stone, Russell, & Patterson, 2004). This moral foundation can be essential when inevitable project issues and challenges arise, because project members are by definition followers whose assignment is temporary (Thamhain & Gemmill, 1974), and thus they may have less allegiance to the project manager because there are no traditional employee incentives such as compensation, promotion, or future work assignments. Morality is a strong and recurring theme in servant leadership theory, can be found in nearly all constructs beginning with the progenitor of servant leadership (Greenleaf, 1977) and continuing to most contemporary servant leadership researchers (Graham, 1991; Patterson, 2003; Reed, Vidaver-Cohen & Colwell, 2011; Sendjaya & Sarros, 2002; Stone, Russell, & Patterson, 2004).

### **Humility**

The SLS includes five items or questions to measure humility (Appendix B, Appendix E survey, questions 16, 24, 31, 35 and 36). Forgiveness had a medium-to-large correlation to project success (0.485) as developed in the Pearson product-moment correlation calculation, meaning that higher humility ratings of the project manager were moderately-to-strongly associated with higher ratings for project success. Using MLR

techniques to compare the unique contribution of each independent variable to the regression model (the beta standardized coefficient value, see Table 4.16), humility did not make a significant and unique contribution to explaining project success.

### **Stewardship**

The SLS includes three items or questions to measure stewardship (Appendix B, Appendix E survey, questions 17, 25 and 32). Stewardship had a medium correlation to project success (0.429) as developed in the Pearson product-moment correlation calculation, meaning that higher stewardship ratings of the project manager were moderately associated with higher ratings for project success. Using MLR techniques to compare the unique contribution of each independent variable to the regression model (the beta standardized coefficient value, see Table 4.16), stewardship did not make a significant and unique contribution to explaining project success.

### **Accountability**

The SLS includes three items or questions to measure accountability (Appendix B, Appendix E survey, questions 12, 20 and 28). Accountability had a medium correlation to project success (0.352) as developed in the Pearson product-moment correlation calculation, meaning that higher accountability ratings of the project manager were moderately associated with higher ratings for project success. Using MLR techniques to compare the unique contribution of each independent variable to the regression model (the beta standardized coefficient value, see Table 4.16), accountability did not make a significant and unique contribution to explaining project success.

## **Forgiveness**

The SLS includes three items or questions to measure forgiveness (Appendix B, Appendix E survey, questions 13, 21 and 29). Forgiveness had a small correlation to project success (0.263) as developed in the Pearson product-moment correlation calculation, meaning that higher accountability ratings of the project manager were weakly associated with higher ratings for project success. Using MLR techniques to compare the unique contribution of each independent variable to the regression model (the beta standardized coefficient value, see Table 4.16), forgiveness did not make a significant and unique contribution to explaining project success.

## **Courage**

The SLS includes two items or questions to measure courage (Appendix B, Appendix E survey, questions 14 and 22). Courage had a small correlation to project success (0.206) as developed in the Pearson product-moment correlation calculation, meaning that higher courage ratings of the project manager were only weakly associated with higher ratings for project success. Using MLR techniques to compare the unique contribution of each independent variable to the regression model (the beta standardized coefficient value, see Table 4.16), courage did not make a significant and unique contribution to explaining project success.

## **Standing back**

The SLS includes three items or questions to measure standing back (Appendix B, Appendix E survey, questions 11, 19 and 27). Standing back had a medium correlation to project success (0.263) as developed in the Pearson product-moment correlation calculation, meaning that higher standing back ratings of the project manager were

modestly associated with higher ratings for project success. Using MLR techniques to compare the unique contribution of each independent variable to the regression model (the beta standardized coefficient value, see Table 4.16), standing back did not make a significant and unique contribution to explaining project success.

### **Additional considerations**

#### **Gender influences**

The results of the study showed that the ratings for servant leadership and corresponding project success ratings were higher for women (n=10) than for men (n=115). The rating differentials for women over men ranged from 7.3% higher on average for project success, with servant leadership factors ranging from 7.8% to 23.3% higher. In particular, three of the servant leadership variables – empowerment, standing back, and courage – showed that women project managers were rated, on average, more than 20% higher than men. This small sample result may be representative of perceived servant leadership characteristics such as empathy and healing promoted by Spears (Van Dierendonck, 2010). Even though gender analysis was not related to the primary research question, this data extends the findings of Neuhauser (2007), who evaluated women leaders and other leadership theories, and may also be worthy of specific further research to explore the influences and relationship of gender in servant leadership situations.

#### **Leadership development**

Despite advances in project manager certifications and professional development (PMI, 2002), aerospace and defense industry failures attributable to failures in leadership have continued (Sausser, Reilly, & Shenhar, 2009; United States Government Accountability Office, 2010). The present study's conclusions present a new opportunity

for meeting the call from project management scholars for project management research to engage perspectives beyond the prevalent focus on project leadership skills and competencies (Lindgren & Packendorff, 2009), and introduce servant leadership into development curriculums and designs. In addition, the aforementioned gap in the literature for the intersection of servant leadership and project management has denied project managers in all industries and related researchers the opportunity to examine servant leadership as an effective leadership style to address ongoing project leadership challenges (Anantatmula, 2010; Geoghegan & Dulewicz, 2008; Keller, 2008; Muller & Turner, 2010; Nixon, Harrington, & Parker, 2012; PMI, 2008; Standish Group International, 2001; Turner & Muller, 2005). By addressing this gap, this study may contribute to further expansion of project leadership competencies sought by organizations such as the Defense Acquisition University (Gadeken, 2002) and their subsequent training and development approaches.

### **Project leadership and success**

The study also contributed to the project management literature and the study of project success (Pinto & Slevin, 1988, 1994) by identifying servant leadership as a valid theoretical construct for consideration in project management and leadership studies. This study furthered the application maturity of the PIP scale through the examination of its relationship to a servant leadership model, and through the collection of additional data from the aerospace and defense industry. By demonstrating the confirmed relationship between project success and servant leadership behaviors, the study opened possibilities for new study of project leadership and its relationship to project success (Muller,

Geraldi, & Turner, 2011) as an active domain of research (Turner & Muller, 2005; Dvir, Sadeh, & Malach-Pines, 2006).

### **Limitations**

While finding strong associations between two of the servant leadership variables (empowerment and authenticity) and project success, the study did not identify that such behaviors uniquely can necessarily lead to project success. To do so would require incorporation of a much wider set of project management variables, such as scope, cost, risk, and schedule management. The results of the study demonstrate only that some aspects of servant leadership are associated with project success.

Because this study used convenience sampling, a non-probability sampling technique, the degree of generalizability of results is limited. The sample size of 115 cases may is not sufficient to draw broad applicability conclusions with a high degree of confidence. The results are applicable primarily to the aerospace and defense industry, and only for projects where the team member had contributed within the past year, and where the project manager was not the team members' direct supervisor. For each project case reported, only one person is known to have reported about that project, thus limiting the cross-section of perspectives that might have been collected, since there are usually many persons that contribute to a given project. Responses from the target population were collected on a self-selected basis, which may have introduced a variety of issues such as self-selection bias, acquiescence bias, and non-respondent error.

### **Recommendations for Action**

The findings from this study may be useful to organizations that support or endorse servant leadership principles, and especially those who employ or contract with



project managers. This study may help such organizations understand that their projects may viably adopt and train for selected servant leadership practices – in particular, empowerment and authenticity - to contribute to a greater possibility of project success. The results of this study may inspire other researchers to explore the intersection of servant leadership and project management, and for practicing organizations to sponsor additional studies.

### **Recommendations for Further Research**

There are ample needs and opportunities for the continued study of the relationship between servant leadership behaviors and the success of projects. Because the present study was limited by convenience sampling of projects and project team members across multiple projects in the aerospace and defense industry, an increase in sample size and variation in composition are two immediate recommendations for further research. While the present study included a broad heterogeneous set of organizations and their projects, because it obtained input from only a single project member for each entire project, the views of that single person cannot reliably be taken as fully representative for the evaluated project. To achieve improved reliability, future research should examine a single project in depth, which could be extended to evaluate all of the projects in a single organization's portfolio. When compared to the results seen herein, such studies may contribute to better generalizability and predictability using similar multiple linear regression analysis. Additional studies should also be done using a larger sample, as well as in other industries and global locations that utilize project managers, to determine if similar results would be seen on a larger scale and in a different industry or

geographic context, and to isolate the correlation factors and regression model seen in this study.

The present study avoided self-rater bias by having project team members as followers rate the project managers (leader). However, an improvement for future research might include multi-level data collection, wherein responses for the project success variable is also provided by project customers or sponsors, who may be in a better position than project team members to evaluate the success (or lack thereof) for a project.

The demographic results of the present study indicated that the women project managers were rated higher, for all studied variables, than male project managers, in some cases significantly higher (twenty percent or more). Future studies should be undertaken to determine if and why female project managers are more likely to demonstrate servant leadership behaviors (and which ones, if so), and if as a result female project managers are more likely to achieve higher project success ratings. Using the data collected in this study, supplemented by additional information on female project managers, another analysis could examine the differences of gender among female-male project managers as related to project performance (PIP) and evaluate one or more of the SLS factors as a dependent variable.

Future research could also evaluate some of the demographic categorical variables collected in this study, which could be used as dependent or independent variables in separate analyses evaluating a different research question. Future studies may seek to consider years of experience, and its natural association with age, as a variable in how servant leadership qualities are viewed by followers. Future studies directed toward the

aerospace and defense industry might consider project type (e.g. software, hardware, aviation, shipbuilding) as an independent variable, and incorporate a new variable of associated complexity, to determine how servant leadership qualities are viewed by followers, and how these relate to the success of the related project. Similar alternative dependent variable analyses could be evaluated among project types. Future studies may seek to consider the variable of time having worked with the project manager as leader as an independent variable in how servant leadership qualities are viewed by followers, or even conduct a longitudinal study to see how those views may change over time. Each of these research designs could be oriented toward practical value for organizations by providing insight to leadership characteristics and behaviors that can contribute to successful project outcomes.

## References

- Alexa (2012). Alexa the web information company. Retrieved April 3, 2012 from <http://www.alexacom/siteinfo/linkedin.com#>.
- Allender, D. B. (2006). *Leading with a limp*. Colorado Springs, CO: WaterBook Press.
- Amason, A.C., Aronson, Z., Dominick, P., Holahan, P., Lechler, T., Mooney, A., Reilly, R. & Shenhar, A. (2007). *The human side of project leadership*. Newtown, PA: Project Management Institute.
- Ammeter, A. P. & Dukerich, J. M. (2002). Leadership, team building, and team member characteristics in high performance project teams. *Engineering Management Journal*, 14(4), 3-10.
- Anantatmula, V. S. (2010). Project management leadership role in improving project performance. *Engineering Management Journal*, 22(1), 13-22.
- Associated Press (2007, October 17). *New York Times*. 787 program chief replaced at Boeing. Retrieved from [http://www.nytimes.com/2007/10/17/business/17boeing.html?\\_r=1&oref=sloginm](http://www.nytimes.com/2007/10/17/business/17boeing.html?_r=1&oref=sloginm)
- Avolio, B. J., Walumbwa, F. O. & Weber, T. J. (2009). Leadership: Current Theories, Research, and Future Directions. *Annual Review of Psychology*, 60, 421-449
- Azizian, N. (2012). Personal communications regarding the use of LinkedIn® for dissertation survey. January 14, 2012.
- Baker, P. M., Briscout, J. C., Moon, N. W., Coughlan, P. & Pater, J. (2013). Communities of participation: A comparison of disability and aging identified groups on Facebook and LinkedIn®. *Telematics and Informatics*, 30(1), 22-34.

- Barbuto, J. E., Story, J. S. & Gifford, G. T. (2008). Comments on Dannhauser and Boshoff's "Structural Equivalence of the Barbuto and Wheeler Servant Leadership Questionnaire on North American and South African Samples". *International Journal of Leadership Studies*, 4(1), 101-103.
- Barbuto, J. E. & Wheeler, D. W. (2006). Scale development and construct clarification of servant leadership. *Group & Organization Management*, 31, 200-326.
- Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York, NY: The Free Press.
- Bass, B. M., & Avolio, B. J. (1994). *Improving organizational effectiveness through transformational leadership*. St. Louis, MO: Sage Publications.
- Bennis, W. (1989). *On becoming a leader*. New York, NY: Addison Wesley.
- Besner, C. & Hobbs, B. (2006). The perceived value and potential contribution of project management practices to project success. *Project Management Journal*, 37(3), 37-48.
- Blake, R. R. & Mouton, S. J. (1978). *The new managerial grid*. Houston, TX: Gulf.
- Brill, J. M., Bishop, M. J., & Walker, A. E. (2006). The competencies and characteristics required of an effective project manager: A web-based Delphi study. *Educational Technology, Research and Development*, 54(2), 115-140.
- Brown, K. A. (2000). Developing project management skills: A service learning approach. *Project Management Journal*, 31(4), 53-58.
- Brown, T., Potoski, M. & VanSlyke, D. (2008). *Accountability challenges in public sector contracting for complex products*. Kettering Symposium on Public Accountability, Dayton, OH, May 22-24, 2008

- Brown, M. E., Treviño, L. K., & Harrison, D. (2005). Ethical leadership: A social learning perspective for construct development and testing. *Organizational Behavior and Human Decision Processes*, 97, 117-134.
- Brown, M. E., & Treviño, L. K. (2006). Ethical leadership: A review and future directions. *The Leadership Quarterly* 17(6), 595-616.
- Burns, J. M. (1978). *Leadership*. New York, NY: Harper & Row.
- Burns, M. (2009, January 22). Apple's secret sauce: A simple product line. *Tech Crunch*. Retrieved from <http://techcrunch.com/2009/01/22/apples-success-solution-a-simple-product-line>.
- Carbone, T. A. & Gholston, S. (2004). Project manager skill development: A survey of programs and practitioners. *Engineering Management Journal*, 16(3), 10-16.
- Crevani, L., Lindgren, M., & Packendorff, J. (2010). Leadership, not leaders: On the study of leadership as practices and interactions. *Scandinavian Journal of Management*, 26(1), 77-86.
- Cicmil, S., Hodgson, D., Lindgren, M. & Packendorff, J. (2009). Project management behind the façade. *Ephemera*, 9(2), 78-92.
- Ciulla, J. B. (1998). *Ethics, the heart of leadership*. Westport, CT: Greenwood Publishing.
- Ciulla, J. B. (2003). *The ethics of leadership*. Belmont, CA: Wadsworth/Thomson Learning.
- Cleland, D. I. (1995). Leadership and the project management body of knowledge. *International Journal of Project Management*, 13(2), 83-88.

- Cleland, D. I. (2004). The evolution of project management. *IEEE Transactions on Engineering Management*, 51(4), 396-397.
- Cobb, A. T. (2006). *Leading project teams: An introduction to the basics of project management and project team leadership*. Thousand Oaks, CA: Sage.
- Cohen, J. W. (1988). *Statistical power analysis for the behavioral sciences* (2<sup>nd</sup> ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Columbia Accident Investigation Board (2003). *Report of Columbia Accident Investigation, Volume I, Chapter 6*. Retrieved from [http://anon.nasa-global.speedera.net/anon.nasa-global/CAIB/CAIB\\_lowres\\_chapter6.pdf](http://anon.nasa-global.speedera.net/anon.nasa-global/CAIB/CAIB_lowres_chapter6.pdf)
- Cooke-Davies, T. (2002). The “real” success factors on projects. *International Journal of Project Management*, 20, 185-190.
- Cooper, R. G. (2000). *Product leadership: Creating and launching superior new products*. Cambridge, MA: Perseus Publishing.
- Cooper, R. G. (2001). *Winning at new products*. Cambridge, MA: Perseus Publishing.
- Crawford, L. (2005). Profiling the competent project manager. In D. P. Slevin, D. I. Cleland, & J. K. Pinto (Eds.), *The frontiers of project management research* (pp.151-176). Newtown Square, PA: Project Management Institute.
- Crawford, L. (2005). Senior management perceptions of project management competence. *International Journal of Project Management*, 23(1), 7-16.
- Dannhauser, Z. & Boshoff, A. B. (2007). Structural equivalence of the Barbuto and Wheeler (2006) servant leadership questionnaire on North American and South African samples. *International Journal of Leadership Studies*, 2(2), 148-168.

- Dannhauser, Z. & Boshoff, A. B. (2008). Rejoinder: Comments on Barbuto, Story, and Gifford's "Response". *International Journal of Leadership Studies*, 4(1), 104-106.
- Dansereau, F., Graen, G. B., & Haga, W. (1975). A vertical dyad linkage approach to leadership in formal organizations. *Organizational Behavior and Human Performance*, 13, 46-78.
- Davis, A. S. (2008). Leadership styles in project management: An analysis based on the multifactor leadership questionnaire. (Doctoral dissertation). Retrieved August 11, 2011, from Dissertations & Theses: The Humanities and Social Sciences Collection (Publication No. AAT 3329824).
- Deloitte (2012). *The aerospace and defense industry in the U.S.: A financial and economic impact study*. March 2012. Retrieved from [http://www.aia-aerospace.org/assets/deloitte\\_study\\_2012.pdf](http://www.aia-aerospace.org/assets/deloitte_study_2012.pdf)
- Dennis, R. S. (2004). *Servant leadership theory: Development of the servant leadership assessment instrument* (Doctoral dissertation). Retrieved August 01, 2011, from Dissertations & Theses: The Humanities and Social Sciences Collection (Publication No. AAT 3133544).
- Dennis, R. S., Kinzler-Norheim, L. & Bocarnea, M. (2010). Servant leadership theory: Development of the servant leadership assessment instrument. In D. Van Dierendonck & K. Patterson (Eds.), *Servant leadership: Developments in theory and practice* (pp.169-179). New York: Palgrave Macmillan.
- Dennis, R., & Winston, B. E. (2003). A factor analysis of Page and Wong's servant leadership instrument. *Leadership & Organization Development Journal*, 24(8), 455-459



- DePree, M. (2002). Servant-leadership: Three things necessary. In L. & L. Spears, M. (Ed.), *Focus on leadership: Servant leadership for the 21st century* (89-100). New York: John Wiley
- DeVellis, R. (2003). *Scale development: Theory and applications*. London, UK: Sage.
- DiMarco, N., Goodson, J. R. & Houser, H. F. (1998). Situational leadership in a project/matrix environment. In J. K. Pinto & J. W. Trailer (Eds.), *Leadership skills for project managers* (pp.71-82). Newtown Square, PA: Project Management Institute.
- Dulewicz, S.V. & Higgs, M.J. (2004). A new instrument to assess leadership dimensions and styles. *Selection and Development Review*, 20(2), 7-12.
- Dulewicz, S.V. and Higgs, M.J. (2005) *Leadership dimensions questionnaire: organisation context, leader performance and follower commitment*. Henley, UK: Henley Business School, University of Reading, Henley Working Paper Series (2005 01).
- Dvir, D., Sadeh, A. & Malach-Pines, A. (2006). Projects and project managers: The relationship between project manager's personality, project, project types, and project success. *Project Management Journal*, 37(5), 36-48.
- Ehrhart, M. G. (2004). Leadership and justice climate as antecedents of unit-level organizational citizenship behavior. *Personnel Psychology*, 57, 61-94.
- Farr, J. V. & Brazil, D. M. (2009). Leadership skills development for engineers. *Engineering Management Journal*, 21(1), 3-8.
- Ferraro, J. (2008). *The strategic project leader: Mastering service-based project leadership*. Boca Raton, FL: Auerbach Publications.

- Fiedler, F. E. (1967). *A theory of leadership effectiveness*. New York, NY: McGraw-Hill.
- Fiedler, F. (1971). Validation and extension of the contingency model of leadership effectiveness: A review of empirical findings. *Psychological Bulletin*, 76(2), 128-148.
- Fiedler, F. (1972). The effects of leadership training and experience: A contingency model interpretation. *Administrative Science Quarterly*, 17(4), 453-470.
- Fiedler, F.E. (1978). Contingency model of leadership effectiveness, in L. Berkowitz, (Ed.), *Advances in Experimental Social Psychology* (pp. 60-112). New York, NY: Academic Press.
- Fiedler, F. E. & House, R. J. (1988). Leadership theory and research: A report of progress. In C. I. Cooper & I. Robertson (Eds.), *International Review of Industrial and Organizational Psychology*. New York, NY: Wiley.
- Fields, D. & Winston, B. E. (2012). *Development and evaluation of a new parsimonious measure of servant leadership*. Unpublished manuscript.
- Finch, P. (2003). Applying the Pinto-Slevin project implementation profile to an information systems project. *Project Management Journal*, 34(3), 32-39.
- Fincham, R. (2002). Narratives of success and failure in systems development. *British Journal of Management*, 13(1), 1-14.
- Forsberg, K., Mooz, H. & Cotterman, H. (2005). *Visualizing project management* (3rd ed.). New York, NY: John Wiley & Sons.
- Frese, R. & Sauter, V. (2003). Project success and failure: What is success, what is failure, and how can you improve your odds for success? Retrieved from [http://www.umsl1.edu/~sauterv/analysis/6840\\_f03\\_papers/frese](http://www.umsl1.edu/~sauterv/analysis/6840_f03_papers/frese)

- Gaddis, P. O. (1959). The project manager. *Harvard Business Review* 37(3), pp. 89-97.
- Gadeken, O.C. (2005). What the United States Defense Systems Management College has learned from ten years of project leadership research. In D. P. Slevin, D. I. Cleland, & J. K. Pinto (Eds.), *The frontiers of project management research* (pp. 97-113). Newtown Square, PA: Project Management Institute.
- Gardner, W. L., Avolio, B. J., Luthans, F., May, D. R., & Walumbwa, F. O. (2005). Can you see the real me? A self-based model of authentic leader and follower development. *The Leadership Quarterly*, 16(3), 343-372.
- Gehring, D. R. (2007). Applying traits theory of leadership to project management. *Project Management Journal*, 38(1), 44-54.
- Geoghegan, L. & Dulewicz, V. (2008). Do project management managers' leadership competencies contribute to project success? *Project Management Journal*, 39(4), 58-67.
- Government Accountability Office (2010). *Strong leadership is key to planning and executing stable weapons programs*, GAO-10-522. Retrieved from [www.gao.gov/assets/310/304106.pdf](http://www.gao.gov/assets/310/304106.pdf)
- Graen, G. B. & Uhl-Bien, M. (1995). Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level, multi-domain perspective. *Leadership Quarterly*, 6(2), 219-247.
- Graham, J. W. (1991). Servant-leadership in organizations: Inspirational and moral. *Leadership Quarterly*, 2(2), 105-119.
- Greenleaf, R. K. (1970). *The servant as a leader*. Indianapolis, IN: Greenleaf Center.

- Greenleaf, R. K. (1977). *Servant leadership*. New York, NY: Paulist Press.
- Griffin, A. (1997). PDMA research on new product development practices: Updating trends and benchmarking best practices. *Journal of Product Innovation and Management*, 14(6), 429-458.
- Guillen, M. F. (2010). Classical sociological approaches to the study of leadership. In N. Nohira & R. Khurana (Eds.), *Handbook of leadership theory and practice: A Harvard Business School centennial colloquium*. Boston, MA: Harvard Business School Publishing.
- Hartman, K. & Ashrafi, R. (2002). Project management in the information systems and technologies industries. *Project Management Journal*, 33(3), 5-15.
- Hass, K. (2009). *Managing complex projects: A new model*. Vienna, VA: Management Concepts.
- Hass, K. (2011). Managing complex projects: Part 1. *Project Times*. Retrieved from <http://www.projecttimes.com/articles/managing-complex-projects-part-1.html>
- Hauschildt, J., Gesche, K. & Medcof, J. W. (2000). Realistic criteria for project manager selection and development. *Project Management Journal*, 31(3), 23-32
- Heifetz, R. A. (1994). *Leadership without easy answers*. Cambridge, MA: Harvard University Press.
- Hersey, P. & Blanchard, K. H. (1993). *Management of organizational behavior: Utilizing human resources* (6<sup>th</sup> ed.). Englewood Cliffs, NJ: Prentice Hall.
- Hesse, H. (2010). *Journey to the East*. London, UK: Aziloth Books.
- Hodges, J. & Quinn, K. (2011, September 1). U.S. Navy chief talks up drones. *C4ISR Journal*. Retrieved from <http://www.c4isrjournal.com/story.php?F=7625145>

- Hodgson, D. & Cicmil, S. (2007). The politics of standards in modern management: Making 'the project' a reality. *Journal of Management Studies*, 44(3), 431-450.
- House, R. J. (1971). A path-goal theory of leader effectiveness. *Administrative Science Quarterly*, 16(3), 321-339.
- House, R. J. (1976). A 1976 theory of charismatic leadership. In J.G. Hunt & L.L.Larson (Eds.), *Leadership: The cutting edge* (pp.189-207). Carbondale, IL: Southern Illinois University Press.
- Igason, H. T. & Jonasson, H. I. (2009). Contemporary knowledge and skill requirements in project management. *Project Management Journal*, 40(2), 59-69.
- Ika, L. A. (2009). Project success as a topic in project management journals. *Project Management Journal*, 40(4), 6-20.
- Ilies, R., Morgeson, F. P., & Nahrgang, J. D. (2005). Authentic leadership and eudaemonic well-being: Understanding leader-follower outcomes. *The Leadership Quarterly*, 16(3), 373-394.
- International Centre for Complex Project Management (2011). *Research and innovation strategy*. Retrieved from [http://www.iccpm.com/index.php?option=com\\_content&view=article&id=121:research-and-innovation-strategy&catid=41&Itemid=167](http://www.iccpm.com/index.php?option=com_content&view=article&id=121:research-and-innovation-strategy&catid=41&Itemid=167)
- Irving, J. (2010). Cross-cultural perspectives on servant leadership. In D. Van Dierendonck & K. Patterson (Eds.), *Servant leadership: Developments in theory and practice* (pp.118-129). New York, NY: Palgrave Macmillan.
- Johnson, C. (2001). *Meeting the ethical challenges of leadership*. Thousand Oaks, CA: Sage.

- Jugdev, K. & Muller, R. (2005). A retrospective look at our evolving understanding of project success. *Project Management Journal*, 36(4), 19-31.
- Juli, T. (2010). *Leadership principles for project success*. Boca Raton, FL: CRC Press.
- Kanungo, R. N., & Mendonca, M. (1996). *Ethical dimensions of leadership*. Thousand Oaks, CA: Sage.
- Keegan, A. E., & Den Hartog, D. N. (2004). Transformational leadership in a project based environment: A comparative study. *International Journal of Project Management*, 22, 609-617
- Keller, R. T. (2008). Transformational leadership and the performance of research and development project groups. *IEEE Engineering Management Review*, 26(2), 82-91.
- Kerlinger, F. N. & Lee, H. B. (2000). *Foundations of behavioral research* (4<sup>th</sup> ed.). Fort Worth, TX: Harcourt.
- Kerzner, H. & Belack, C. (2010). *Managing complex projects*. Hoboken, NJ: John Wiley & Sons.
- Kloppenborg, T. J. (2009). *Contemporary project management*. Mason, OH: Cengage Learning.
- Kloppenborg, T. J., Shriberg, A. & Venkatraman, J. (2003). *Project leadership*. Vienna, VA: Management Concepts.
- Krahn, J. (2006). *Effective project leadership: A combination of project manager skills and competencies in context*. PMI Research Conference Proceedings (July 2006).

- Kopytoff, V. G. (2011, June 19). Japanese “K” computer is ranked most powerful. *The New York Times*. Retrieved from <http://www.nytimes.com/2011/06/20/technology/20computer.html>
- Kouzes, J. M. (1998). Finding Your Voice. In L. Spears (Ed.), *Insights on leadership: Service, stewardship, spirit, and servant-leadership*. New York, NY: John Wiley.
- Kouzes, J. M. & Posner, B. Z. (1998). *Encouraging the heart*. San Francisco, CA: Jossey-Bass.
- Kouzes, J. M. & Posner, B. Z. (2007). *The leadership challenge* (4<sup>th</sup> ed.). San Francisco, CA: Jossey-Bass.
- Kwak, Y. H. & Anbari, F. T. (2009). Analyzing project management research: Perspectives from top management journals. *International Journal of Project Management*, 27(5), 435-446.
- Laub, J. A. (1999). Assessing the servant organization: Development of the organizational leadership assessment (OLA) instrument. (Unpublished doctoral dissertation). Florida Atlantic University, Boca Raton, FL.
- Lee, M. R. (2010). E-leadership for project managers: A study of situational leadership and virtual project success. (Doctoral Dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 717581516)
- Levine, D. M., Stephan, D. F., Krehbiel, T. C., & Berenson, M. L. (2009). *Statistics for managers using Microsoft® Excel* (6<sup>th</sup> ed.). Upper Saddle River, NJ: Prentice Hall.
- Lewis, J. P. (2003). *Project leadership*. New York, NY: McGraw Hill.
- Lichtenwalner, B. S. (2009). Project management leadership: Servant-leader versus subject matter expert. In M. P. Perry (Ed.), *Business driven PMO setup: Practical*

- insights, techniques, and case examples for ensuring success* (pp.269-285). Fort Lauderdale, FL: J. Ross Publishing.
- Liden, R. C., Wayne, S. J., Zhao, H., & Henderson, D. (2008). Servant leadership: Development of a multidimensional measure and multi-level assessment. *The Leadership Quarterly*, 19(2), 161-177.
- Lindgren, M. & Packendorff, J. (2009). Project leadership revisited: Towards distributed leadership perspectives in project research. *International Journal of Project Organization and Management*, 1(3), 285-308.
- LinkedIn (2012). Press center. Retrieved April 3, 2012 from <http://press.linkedin.com/about>
- Lloyd-Walker, B., & Walker, D. (2011). Authentic leadership for 21st century project delivery. *International Journal of Project Management*, 29(4), 383-395.
- Luthans, F., & Avolio, B. J. (2003). Authentic leadership development. In K. S. Cameron, J. E. Dutton, & R. E. Quinn (Eds.), *Positive organizational scholarship: Foundations of a new discipline* (pp. 241-258). San Francisco, CA: Berrett-Koehler.
- Mehta, S. & Pillay, R. (2011). Revisiting servant leadership: An empirical study in Indian context. *The Journal of Contemporary Management Research*, 5(2), 24-41.
- Milosevic, D. & Patanakul, P. (2005). Standardized project management may increase development projects success. *International Journal of Project Management*, 23(3), 181-192.
- Moore, D. S., & McCabe, G. P. (1989). *Introduction to the practice of statistics*. New York, NY: Freeman.



- Morgan, T. L. (2012). *An examination of project managers' leadership contributions to project success using critical success factors*. (Doctoral Dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 928140184)
- Muller, R., & Turner, J.R. (2007). The influence of project managers on project success criteria and project success by type of project. *European Management Journal*, 25(4), 289-309.
- Muller, R. & Turner, J.R. (2010). Leadership competency profiles of successful project managers. *International Journal of Project Management*, 28(5), 437-448.
- Muller, R., Geraldi, J. & Turner, J.R. (2010). Relationships between leadership and success in different types of project complexities. *IEEE Transactions on Engineering Management*, 57(4), 1-14.
- National Aeronautics and Space Administration. (1986). Rogers Commission: Report of the Presidential Commission on the Space Shuttle Challenger accident. Volume 1, Chapter V. Retrieved from <http://history.nasa.gov/rogersrep/v1ch5.htm>
- Neuhauser, C. (2007). Project manager leadership behaviors and frequency of use by female project managers. *Project Management Journal*, 38(1), 21-31.
- Ngunjiri, F. W. (2010). *Women's spiritual leadership in Africa: Tempered radicals and critical servant leaders*. Albany, NY: State University of New York Press.
- Nieto-Rodriguez, A. & Evrard, D. (2004). *PricewaterhouseCoopers: Boosting business performance through programme and project management*. Retrieved from <http://www.pwc.com/us/en/operations-management/assets/pwc-global-project-management-survey-first-survey-2004.pdf>

- Nixon, P., Harrington, M., & Parker, D. (2012). Leadership performance is significant to project success or failure: A critical analysis. *International Journal of Productivity and Performance Management*, 61(2), 204-216.
- Northouse, P. G. (2007). *Leadership: Theory and practice* (4<sup>th</sup> ed.). Thousand Oaks, CA: Sage.
- Packendorff, J. (1995). Inquiring into the temporary organization: New directions for project management research. *Scandinavian Journal of Management*, 11(4), 319-333.
- Page, D., & Wong, T. P. (2000). A conceptual framework for measuring servant leadership. In S. Abjibolosoo (Ed.), *The human factor in shaping the course of history and development*. Lanham, MD: University of Maryland.
- Parolini, J., Patterson, K. & Winston, B. (2009). Distinguishing between transformational and servant leadership. *Leadership and Organization Development Journal*, 30(3), 274-291.
- Patterson, K. A. (2003). *Servant leadership: A theoretical model* (Doctoral dissertation). Retrieved from Dissertations & Theses: The Humanities and Social Sciences Collection (Publication No. AAT 3082719)
- Patterson, K. (2008). Servant leadership: A timeless leadership style. *Engstrom Institute*. Retrieved from <http://www.engstrominstitute.com/executiveleadership/2007/servantleadership.html?start=5>
- Perry, M. P (2009). *Business driven PMO setup: Practical insights, techniques, and case examples for ensuring success*. Fort Lauderdale, FL: J. Ross Publishing.

- Petroski, H. (2006). *Success through failure: The paradox of design*. Princeton, NJ: Princeton University Press.
- Phillips, S. (2004). Can humility, faith be good for business? In D. Corvo (Senior Executive Producer), *Dateline: NBC*. New York, NY: National Broadcasting Company.
- Pinto, J.K. & Mantel, S.J. (1990). The causes of project failure. *IEEE Transactions on Engineering Management*, 37(4), 269–276.
- Pinto, J. K. & Slevin, D. P. (1986). The project implementation profile: New tools for project managers. *Project Management Journal*, 17(4), pp.57-70.
- Pinto, J. K. & Slevin, D. P. (1988). Project success: Definition and measurement techniques. *Project Management Journal*, 19(1), pp.67-71.
- Pinto, J. K. & Slevin, D. P. (1994). Project implementation profile (2<sup>nd</sup> printing). Pittsburgh, PA: Innodyne.
- Pinto, J. K. & Slevin, D. P. (1995). Critical success factors in effective project implementation. In D. I. Cleland & W. R. King (Eds.), *Project management handbook*, (2<sup>nd</sup> ed.), pp.167-190. New York, NY: Van Nostrand Reinhold.
- Pinto, J. K., Thoms, P., Trailer, J., Palmer, T., & Govekar, M. (1998). *Project leadership: From theory to practice*. Newtown Square, PA: Project Management Institute.
- Pinto, J. K. & Trailer, J. W. (1998). *Leadership skills for project managers*. Newtown Square, PA: Project Management Institute.
- Prabhakar, P. B. (2005). Switch leadership in projects: An empirical study reflecting the importance of transformational leadership on projects success across twenty-eight nations. *Project Management Journal*, 36(4), pp.53-60.

- Price, T. (2005). *Understanding ethical failures in leadership*. Cambridge, MA: Cambridge University Press.
- PricewaterhouseCoopers International Limited (2011). Aerospace & defence 2010 annual review and 2011 forecast: PwC. Retrieved from <http://www.pwc.com/gx/en/aerospace-defence/aerospace-and-defence-2010-annual-review-and-2011-forecast.jhtml>
- Project Management Institute (2002). *Project manager competency development framework*. Newtown Square, PA: Project Management Institute.
- Project Management Institute (2008). A guide to the project management body of knowledge (PMBOK Guide), (4<sup>th</sup> ed). Newtown Square, PA: Project Management Institute.
- Project Management Institute (2012). *About us*. Retrieved from <http://www.pmi.org/About-Us.aspx>
- Rad, P. F. & Anantatmula, V. S. (2010). *Successful project management practices*. Bingley, UK: Emerald Group.
- Rea, L. M., & Parker, R. A. (1997). *Designing and conducting survey research: A comprehensive guide* (2nd ed.). San Francisco, CA: Jossey-Bass.
- Redmond, F. (2010, November). *Social networking sites: Evaluating and investigating their use in academic research*. Paper presented at the 2010 International Conference of Education, Research, and Innovation, Madrid, Spain.
- Reed, L. L., Vidaver-Cohen, D. & Colwell, S. R. (2011). A new scale to measure executive servant leadership: Development, analysis, and implications for research. *Journal of Business Ethics*, 101, 415-434.

- Rost, J. C. (1991). *Leadership for the twenty-first century*. Westport, CT: Praeger.
- Russell, R. F. & Stone, A. G. (2002). A review of servant leadership attributes: Developing a practical model. *Leadership & Organization Development Journal*, 23(3), 145-157.
- Sauser, B. J., Reilly, R. R., & Shenhar, A. J. (2009). Why projects fail? How contingency theory can provide new insights – A comparative analysis of NASA's Mars Climate Orbiter loss. *International Journal of Project Management*, 27(7), 665-679.
- Sendjaya, S. & Sarros, J.C. (2002). Servant leadership: Its origin, development, and application in organizations, *Journal of Leadership & Organizational Studies*, 9(2): 57-64.
- Sendjaya, S. & Cooper, B. (2011). Servant leadership behavior scale: A hierarchical model and test of construct validity. *European Journal of Work and Organizational Psychology*, 20(3), 416-436.
- Shenhar, A. J. & Dvir, D. (2007). *Reinventing project management: The diamond approach to successful growth and innovation*. Boston, MA: Harvard Business School Publishing.
- Shenhar, A., Levy, O. & Dvir, D. (1997). Mapping the dimensions of project success. *Project Management Journal*, 29(2), 5-13.
- Shenhar, A.J., Tishler, A., Dvir, D., Lipovestsky, S. & Lechler, T. (2002). Refining the search for project success factors: A multivariate typological approach. *R&D Management*, 32(2), 111-126.

- Shi, Q. & Chen, J. (2006). *The human side of project management: Leadership skills*. Newtown Square, PA: Project Management Institute.
- Simmons, K. O. & Korrapati, R. (2004). A study to examine factors that contribute to software project success. *Proceedings of the Academy of Information and Management Sciences*, 8(2), 47-50.
- Sipe, J. W. & Frick, D. M. (2009). *Seven pillars of servant leadership*. New York, NY: Paulist Press.
- Slevin, D. P., Cleland, D. I., & Pinto, J. K. (2002). *The frontiers of project management research*. Newtown Square, PA: Project Management Institute.
- Slevin, D. P. & Pinto, J. K. (1998). Project leadership: Understanding and consciously choosing your style. In J. K. Pinto & J. W. Trailer (Eds.), *Leadership skills for project managers* (pp.29-43). Newtown Square, PA: Project Management Institute.
- Slevin, D. P. & Pinto, J. K. (2006). Project critical success factors: The project implementation profile. In D. I. Cleland and R. Gareis (Eds.), *Global project management handbook: Planning, organizing, and controlling international projects*, 2<sup>nd</sup> Ed. (pp.235-251) New York, NY: McGraw-Hill.
- Smyrk, J. (2008). Leadership in Action. Tasmanian Office of eGovernment. Retrieved from [http://www.egovernment.tas.gov.au/\\_\\_data/assets/pdf\\_file/0006/77856/A\\_Leadership\\_in\\_Action\\_Session\\_Presentation\\_-\\_John\\_Smyrk.pdf](http://www.egovernment.tas.gov.au/__data/assets/pdf_file/0006/77856/A_Leadership_in_Action_Session_Presentation_-_John_Smyrk.pdf)
- Soderlund, J. (2004). Building theories of project management: Past research, questions for the future, *International Journal of Project Management*, 22(3), 183-191.

- Sotiriou, D., & Wittmer, D. (2001). Influence methods of project managers: Perceptions of team members and project managers. *Project Management Journal*, 32(3), 12-20.
- Spears, L. C. (1995). *Reflections on leadership: How Robert K. Greenleaf's theory of servant leadership influenced today's top management thinkers*. New York, NY: John Wiley.
- Spears, L. C. (1996). Reflections on Robert K. Greenleaf and servant-leadership. *Leadership & Organization Development Journal*, 17(7), 33-35.
- Spears, L. C. (2010). Servant leadership and Robert K. Greenleaf's legacy. In D. Van Dierendonck . & K. Patterson (Eds.), *Servant leadership: Developments in theory and practice* (pp.11-23). New York, NY: Palgrave Macmillan.
- Standish Group (1995). *The Standish group report: Chaos*. The Standish Group.  
Retrieved from [http://www.spinroot.com/spin/Doc/course/Standish\\_Survey.htm](http://www.spinroot.com/spin/Doc/course/Standish_Survey.htm)
- Standish Group International (1999). *CHAOS: A recipe for success*. Retrieved from <http://www.velocitystorm.com/wp-content/uploads/2011/03/chaos.pdf>
- Standish Group International (2001). *Extreme chaos*. Retrieved from <http://www.scribd.com/doc/10167963/Chaos-Report-2001>.
- Standish Group International (2009). *CHAOS summary 2009*. Retrieved from <http://www.scribd.com/doc/36877347/CHAOS-Summary-2009>
- Stogdill, R. M. (1948). Personal factors associated with leadership: A survey of the literature. *Journal of Psychology*, 25, 35-71.
- Stogdill, R. M. (1974). *Handbook of leadership: A survey of theory and research*. New York, NY: Free Press.

- Stone, A. G., Russell, R. F. & Patterson, K. (2003, August). *Transformational versus servant leadership: A difference in leader focus*. Paper presented at the Regent University, Servant Leadership Research Roundtable, Virginia Beach, VA, USA.
- Thamhain, H. J. (2002). Criteria for effective leadership in technology-oriented project teams. In D. P. Slevin, D. I. Cleland, & J. K. Pinto (Eds.), *The frontiers of project management research* (pp.259-269). Newtown Square, PA: Project Management Institute.
- Thamhain, H. J. (2004). Leading technology-based project teams. *Engineering Management Journal*, 16(2), 35-42.
- Thamhain, H. J. (2008). Team leadership effectiveness in technology-based project environments. *IEEE Engineering Management Review*, 36(1), 165-180.
- Thamhain, H. J. & Gemmill, G. R. (1974). Influence styles of project managers: Some project performance correlates. *Academy of Management Journal*, 17(2), 216-224.
- Thite, M. (1999). Identifying key characteristics of technical project leadership. *Leadership & Organization Development Journal*, 20(5), 253-261.
- Thite, M. (2000). Leadership styles in information technology projects. *International Journal of Project Management*, 18(4), 235-241.
- Thompson, K. N. (2010). *Servant-leadership: An effective model for project management* (Doctoral dissertation). Retrieved from Dissertations & Theses: The Humanities and Social Sciences Collection (Publication No. AAT 3423176).
- Turner, J. R. (2010). Evolution of project management research as evidenced by papers published in the International Journal of Project Management. *International Journal of Project Management*, 28(1), 1-6.



- Turner, J. R. & Muller, R. (2003). On the nature of the project as a temporary organization. *International Journal of Project Management*, 21(1), 1-8.
- Turner, J. R. & Muller, R. (2005). The project manager's leadership style as a success factor on projects: A literature review. *Project Management Journal*, 36(2), 49-61.
- Turner, J. R. & Muller, R. (2006). *Choosing appropriate project managers: Matching their leadership style to the type of project*. Newtown Square, PA: Project Management Institute.
- U.S. Bureau of Ocean Energy Management, Regulation and Enforcement/U.S. Coast Guard Joint Investigation Team (2011). *Report of investigation into the circumstances surrounding the explosion, fire, sinking and loss of eleven crew members aboard the mobile offshore drilling unit Deepwater Horizon in the Gulf of Mexico, April 20 – 22, 2010*; Volume I MISLE Activity Number: 3721503. Retrieved from <http://www.boemre.gov/ooc/press/2011/press0914.htm>
- U.S. Department of Homeland Security (2007). *110'/123' maritime patrol boat modernization project*. Office of Inspector General, OIG-07-27.
- Van Dierendonck . D. (2011). Servant leadership: A review and synthesis. *Journal of Management*, 37(4), 1228-1261.
- Van Dierendonck , D. & Heeren, I. (2006). Toward a research model of servant-leadership. *The International Journal of Servant-Leadership*, 2, 147-169.
- Van Dierendonck , D. & Nuijten, I. (2011). The servant leadership survey: Development and validation of a multidimensional measure. *Journal of Business and Psychology*, 26(3), 249-267.

- Van Dierendonck , D. & Patterson, K. (2010). *Servant leadership: Developments in theory and practice*. New York, NY: Palgrave Macmillan.
- Walumbwa, F. O., Avolio, B. J., Gardner, W. L., Wernsing, T. S., & Peterson, S. J. (2008). Authentic leadership: Development and validation of a theory-based measure. *Journal of Management*, 34(1), 89-126.
- Wang, E., Chou H-W., & Jiang, J. (2005). The impacts of charismatic leadership style on team cohesiveness and overall performance during ERP implementation. *International Journal of Project Management*, 23, 173-180.
- White, B. S. (2004). *Can a project manager be a servant leader? A reflective critique*. Retrieved from [http://www.maxwideman.com/guests/servant/servant\\_leader.htm](http://www.maxwideman.com/guests/servant/servant_leader.htm)
- Whitten, N. (1996). Attributes of the successful project leader, in *People in projects* (2001). Newtown Square, PA: Project Management Institute.
- Whitten, N. (2000, March). *How technical must a project manager be?* PM Network, Project Management Institute. Retrieved from <http://nealwhittengroup.com/2000/03/how-technical-must-a-project-manager-be/>
- Wren, J. T. (2006). A quest for a grand theory of leadership. In G. R. Goethals & G. L. J. Sorenson (Eds.), *The quest for a general theory of leadership* (pp.1-38). Cheltenham, UK: Edward Elgar Publishing.
- Yang, L., Huang, C., & Wu, K. (2011). The association among project manager's leadership style, teamwork and project success. *International Journal of Project Management*, 29(3), 258-267.
- Yukl, G. (2006). *Leadership in organizations*. Upper Saddle River, NJ: Pearson Prentice-Hall.

- Zaccaro, S. J. (2007). Trait-based perspectives of leadership. *American Psychologist*, 62(1), 6-16.
- Zhang, J. & Faerman, S. R. (2007). Distributed leadership in the development of a knowledge sharing system. *European Journal of Information Systems*, 16, 479-493.
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2012). *Business research methods* (9<sup>th</sup> ed.). Mason, OH: South-Western.
- Zimmerer, T. W., & Yasin, M. M. (1998). A leadership profile of American project managers. *Project Management Journal*, 29(1), 31-38.

## Appendices

### APPENDIX A: Permission to use Survey Instruments

Project Implementation Profile (PIP) use for doctoral dissertation research  
From: Michael Dominik

8/10/11

To: dpslevin

Dear Dr. Slevin,

My name is Michael Dominik, and I am a PhD student (Organizational Leadership) at Eastern University in St Davids PA near Philadelphia. My CV is attached. My professional work has been as an engineer and project manager, and my academic interest is in servant leadership. My dissertation research intends to examine the the quantitative relationship between servant leadership behaviors demonstrated by engineering project managers and the success of their technology-related projects. With your authorization, I would like to consider using the PIP as an instrument to measure project success as the dependent variable in my study.

I therefore respectfully request your approval, expectations, and terms and conditions for this work, as well as a copy of the most current version of the PIP. Thank you for your consideration,

Michael T. Dominik

Dr. Jeffrey Pinto [jkp4@psu.edu](mailto:jkp4@psu.edu) 8/10/11

to me, [dpslevin-katz](mailto:dpslevin-katz).

Dear Mr. Dominik,

Dr. Slevin passed along your note to me. We are happy to grant rights to using the PIP for your research. Please note that this permission extends only to its use for research purposes and not training and development work. Best of luck with your research!

Jeff Pinto

Andrew Morrow and Elizabeth Lee Black Chair in the Management of Technology  
Black School of Business  
Penn State - Erie, the Behrend College  
REDC Building, Jordan Road  
Erie, PA 16563  
(814) 898-6430  
[jkp4@psu.edu](mailto:jkp4@psu.edu)

.....  
RE: Request to use SLS for doctoral research  
FROM: Dierendonck, H.G.H. van  
TO: 'Michael Dominik'  
Tuesday, April 10, 2012 4:03 AM

Dear Michael,

You can indeed use the measure. There are no changes to the measure at the moment.

I would be interested to learn about your research and thesis in due time.

Kind regards,

Dirk

**Van:** Michael Dominik [mailto:mdominik@eastern.edu]  
**Verzonden:** zondag 8 april 2012 20:59  
**Aan:** Dierendonck, H.G.H. van  
**Onderwerp:** Request to use SLS for doctoral research

Dear Dr. Van Dierendonck,

This request may not be required, but in the interest of full ethical conduct, I will ask nonetheless.

I am a PhD candidate at Eastern University in St. Davids PA, USA, whose dissertation will study the relationship between servant leadership behaviors and other outcome variables among technology project managers. I respectfully request your permission to use the Servant Leadership Survey (SLS) developed by yourself and I. Nuijten, as published in the Sept 2011 issue of the Journal of Business & Psychology, 26(3). If there have been any further changes to the measure, I would be grateful to know.

Thank you for your consideration,

Michael T. Dominik

-----disclaimer-----  
De informatie verzonden in dit e-mail bericht inclusief de bijlage(n) is vertrouwelijk en is uitsluitend bestemd voor de geadresseerde van dit bericht. Lees verder.  
The information in this e-mail message is confidential and may be legally privileged. Read more.-----

## APPENDIX B: Servant Leadership Survey (SLS)

### Empowerment

1. My manager gives me the information I need to do my work well.
2. My manager encourages me to use my talents.
3. My manager helps me to further develop myself.
4. My manager encourages his/her staff to come up with new ideas.
12. My manager gives me the authority to take decisions which make work easier for me.
20. My manager enables me to solve problems myself instead of just telling me what to do.
27. My manager offers me abundant opportunities to learn new skills.

### Standing back

5. My manager keeps himself/herself in the background and gives credits to others.
13. My manager is not chasing recognition or rewards for the things he/she does for others.
21. My manager appears to enjoy his/her colleagues' success more than his/her own.

### Accountability

6. My manager holds me responsible for the work I carry out.
14. I am held accountable for my performance by my manager.
22. My manager holds me and my colleagues responsible for the way we handle a job.

### Forgiveness

7. My manager keeps criticizing people for the mistakes they have made in their work (r).
15. My manager maintains a hard attitude towards people who have offended him/her at work (r).
23. My manager finds it difficult to forget things that went wrong in the past (r).

### Courage

8. My manager takes risks even when he/she is not certain of the support from his/her own manager.
16. My manager takes risks and does what needs to be done in his/her view.

### Authenticity

9. My manager is open about his/her limitations and weaknesses.
17. My manager is often touched by the things he/she sees happening around him/her.
24. My manager is prepared to express his/her feelings even if this might have undesirable consequences.
28. My manager shows his/her true feelings to his/her staff.

### Humility

10. My manager learns from criticism.
18. My manager tries to learn from the criticism he/she gets from his/her superior.
25. My manager admits his/her mistakes to his/her superior.
29. My manager learns from the different views and opinions of others.
30. If people express criticism, my manager tries to learn from it.

### Stewardship

11. My manager emphasizes the importance of focusing on the good of the whole.
19. My manager has a long-term vision.
26. My manager emphasizes the societal responsibility of our work.

## APPENDIX C: Project Implementation Profile (PIP)

### Factor 11: Project Performance

**PROJECT PERFORMANCE:**  
In addition to the previous 10 factors, please give your assessment of overall project performance by responding to the following 12 items. Total your overall score for all 12 items at the bottom of the following page.

	STRONGLY DISAGREE		NEUTRAL		STRONGLY AGREE		
1. This project has/will come in on schedule.	1	2	3	4	5	6 7	<input type="checkbox"/>
2. This project has/will come in on budget.	1	2	3	4	5	6 7	<input type="checkbox"/>
3. The project that has been developed works (or, if still being developed, looks as if it will work).	1	2	3	4	5	6 7	<input type="checkbox"/>
4. The project will be/is used by its intended clients.	1	2	3	4	5	6 7	<input type="checkbox"/>
5. This project has directly benefited/will directly benefit the intended users through either increasing efficiency or employee effectiveness.	1	2	3	4	5	6 7	<input type="checkbox"/>
6. Given the problem for which it was developed, this project seems to do the best job of solving that problem—i.e., it was the best choice among the set of alternatives.	1	2	3	4	5	6 7	<input type="checkbox"/>

	STRONGLY DISAGREE		NEUTRAL		STRONGLY AGREE		
7. Important clients, directly affected by this project, will make use of it.	1	2	3	4	5	6 7	<input type="checkbox"/>
8. I am/was satisfied with the process by which this project is being/was completed.	1	2	3	4	5	6 7	<input type="checkbox"/>
9. We are confident that nontechnical start-up problems will be minimal, because the project will be readily accepted by its intended users.	1	2	3	4	5	6 7	<input type="checkbox"/>
10. Use of this project has led/will lead directly to improved or more effective decision making or performance for the clients.	1	2	3	4	5	6 7	<input type="checkbox"/>
11. This project will have a positive impact on those who make use of it.	1	2	3	4	5	6 7	<input type="checkbox"/>
12. The results of this project represent a definite improvement in performance over the way clients used to perform these activities.	1	2	3	4	5	6 7	<input type="checkbox"/>

**PROJECT PERFORMANCE**  
**TOTAL\***   
\*SUM OF ITEMS 1-12 ABOVE

## APPENDIX D: Survey Solicitation

### **Doctoral Survey on Leadership Behaviors of Project Managers – participants needed!**

Have you have worked as a project team member on an aerospace & defense project (or program)? If yes, I would appreciate your participation in this study to rate the behaviors of project managers and the outcome of the project. It will take about 10-15 minutes to complete the survey.

My name is Mike Dominik, and I am a PhD candidate at Eastern University in St. Davids PA, USA. I am conducting a dissertation research study called “Servant Leadership Behaviors of Aerospace and Defense Project Managers and their Relation to Project Success”

I am researching if there is a relationship between how project members perceive the leadership behaviors of their project managers and the outcome of their associated project.

If you are a project team member who has or is currently working on an aerospace & defense project, and believe you are able to provide an honest assessment about the behavior of your project manager and the outcome (actual or expected) of that project, then your response to this survey will contribute to the study of project leadership.

I have prepared a survey to collect data for this study. The survey will ask questions about you, the team member, your project manager, and the outcomes of the project. There are a total of 54 questions in the survey.

Thank you in advance for your willingness to participate.

To begin the survey please click on the link provided below.

<link>



## APPENDIX E: Survey

### **Part 1: Your project and project manager**

Q2. In the most recent one year period, have you worked as part of an aerospace and defense project? This can be an active or completed project. (yes or no) If you answer no to this question, you do not need to respond to the remainder of the questions.

Q3. For this project, have you worked closely with a project manager who was not your direct supervisor? (yes or no) If you answer no to this question, you do not need to respond to the remainder of the questions.

Q4. Please tell us how long, in years or fractional years, that you worked with the subject project manager. (0-1, 1-2, 2-3, 3 or more).

Q5. Please tell us about the type of technology developed in the subject project; multiple selections allowed. (software, hardware, architecture/engineering/construction, space, classified, electronics, aviation, shipbuilding, none of the above, other [enter]).

Q6. Please tell us the gender of the subject project manager. (male or female)

**Part 2: Project Manager Behaviors** (responses given on a seven-point Likert scale, where 1 = strongly disagree, 4 = neutral, and 7 = strongly agree). Your replies should be answered based on the subject project manager.

- 1 = strongly disagree
- 2
- 3
- 4 = neutral
- 5
- 6
- 7 = strongly agree

Q7. My project manager gives me the information I need to do my work well.

Q8. My project manager encourages me to use my talents.

- Q9. My project manager helps me to further develop myself.
- Q10. My project manager encourages the project team members to come up with new ideas.
- Q11. My project manager keeps himself/herself in the background and gives credit to others.
- Q12. My project manager holds me responsible for the work I carry out.
- Q13. My project manager keeps criticizing people for the mistakes they have made in their work.
- Q14. My project manager takes risks even when he/she is not certain of the support from his/her own manager.
- Q15. My project manager is open about his/her limitations and weaknesses.
- Q16. My project manager learns from criticism.
- Q17. My project manager emphasizes the importance of focusing on the good of the whole.
- Q18. My project manager gives me the authority to take decisions which make work easier for me.
- Q19. My project manager is not chasing recognition or rewards for the things he/she does for others.
- Q20. I am held accountable for my performance by my project manager.
- Q21. My project manager maintains a hard attitude towards people who have offended him/her at work.
- Q22. My project manager takes risks and does what needs to be done in his/her view.

Q23. My project manager is often touched by the things he/she sees happening around him/her.

Q24. My project manager tries to learn from the criticism he/she gets from his/her superior.

Q25. My project manager has a long-term vision.

Q26. My project manager enables me to solve problems myself instead of just telling me what to do.

Q27. My project manager appears to enjoy his/her colleagues' success more than his/her own.

Q28. My project manager holds me and my colleagues responsible for the way we handle a job.

Q29. My project manager finds it difficult to forget things that went wrong in the past.

Q30. My project manager is prepared to express his/her feelings even if this might have undesirable consequences.

Q31. My project manager admits his/her mistakes to his/her superior.

Q32. My project manager emphasizes the societal responsibility of our work.

Q33. My project manager offers me abundant opportunities to learn.

Q34. My project manager shows his/her true feelings to his/her project team.

Q35. My project manager learns from the different views and opinions of others.

Q36. If people express criticism, my project manager tries to learn from it.

**Part 3: Project Outcomes** (responses given on a seven-point Likert scale, where 1 = strongly disagree, 4 = neutral, and 7 = strongly agree). Your replies should be answered based on the subject project.

Q37. The project has/will come in on schedule.

Q38. The project has/will come in on budget.

Q39. The project that has been developed works (or, if still being developed, looks as if it will work).

Q40. The project will be/is used by its intended clients.

Q41. This project has directly benefited/will directly benefit the intended users through either increasing efficiency or effectiveness.

Q42. Given the problem for which it was developed, this project seems to do the best job of solving that problem – i.e., it was the best choice among the set of alternatives.

Q43. Important clients, directly affected by this project, will make use of it.

Q44. I am/was satisfied with the process by which this project is being/was completed.

Q45. We are confident that nontechnical start-up problems will be minimal, because the project will be readily accepted by its intended users.

Q46. Use of this project has led/will lead directly to improved or more effective decision making or performance for the clients.

Q47. This project will have a positive impact on those who make use of it.

Q48. The results of this project represent a definite improvement in performance over the way clients used to perform these activities.

#### **Part 4: About yourself**

Q49. Please tell us your years of professional experience. (0-5, 5-10, 10-15, 15-20, 20-25, 35-30, 30 or more)

Q50. Please tell us your current organizational level. (entry level, mid-level, senior, executive, n/a e.g. retired)

Q51. Please tell us your HIGHEST post-secondary degree attained. (bachelor, masters, doctoral, none)

Q52. Please tell us about your college level academic degree(s), multiple selections allowed. (arts & sciences, business, computer science, engineering, none, other [please specify])

## APPENDIX F: Informed Consent

### INFORMED CONSENT FORM

Study Title: Servant Leadership Behaviors of Aerospace and Defense Project Managers and their Relation to Project Success

Researcher: Michael T. Dominik

Email Address: mdominik@eastern.edu

Research Supervisor: Dr. Tony Blair

Email Address: ablair@eastern.edu

The researcher is a PhD candidate at Eastern University in St. Davids, PA and wants to know if you would like to be part of a research study. This form describes the study to help you decide if you want to participate. Do not sign this form (clicking YES below) unless you want to be part of this study.

### WHAT IS THIS STUDY ABOUT?

The researcher wants to study the relationships between project member perceptions of the servant leadership behaviors of project managers and their rating of the success of the project.

### WHY AM I BEING ASKED TO BE IN THE STUDY?

You are invited because you may be a project team member who has or is currently working on an aerospace & defense project, and believe you can provide an honest assessment about the behavior of your project manager and the success (actual or expected) of that project.

### WHO IS PAYING FOR THIS STUDY?

All expenses are borne by the researcher.

### HOW LONG WILL I BE IN THE STUDY?

Answering the questions in the survey will require between 10 to 15 minutes of your

time.

#### WHAT WILL HAPPEN DURING THIS STUDY?

The researcher will ask you questions about yourself, such as years of work experience, education level, etc, and then ask you questions about an aerospace and defense project that you have worked on and questions about the project manager from that project.

#### WILL BEING IN THIS STUDY HELP ME?

Being in this study will not help you, but it might help researchers help others in the future.

#### ARE THERE RISKS TO ME IF I AM IN THIS STUDY?

No study is completely risk-free. However, it is unlikely that you will be harmed during this study. You may stop being in the study at any time if you are uncomfortable. You should be aware, however, that there is a small possibility that responses could be viewed by unauthorized parties (e.g. computer hackers).

#### WILL I BE PAID TO BE PART OF THIS STUDY?

There is no compensation real or implied for being in this study.

#### DO I HAVE TO BE IN THIS STUDY?

Your participation in this study is voluntary. You can decide not to be in the study and you can change your mind about being in the study at any time up to the point where the survey responses are submitted on the last page. If you want to stop being in the study, simply stop taking the survey and don't submit the survey on the last page.

#### CAN I BE IDENTIFIED AS A RESULT OF THIS STUDY?

You will remain anonymous, and no personally identifiable information is captured by the survey.

#### WHO WILL USE AND SHARE INFORMATION FROM THIS STUDY?

The researcher will keep the information you provide in a password protected computer in Sewell, NJ. Only the researcher and dissertation committee members can see the data.

#### WHO CAN I TALK TO ABOUT THIS STUDY?

The Eastern University Institutional Review Board (IRB) has been established to protect the rights and welfare of human research participants. Please contact them via telephone at U.S. (610) 225-5686 or [irb@eastern.edu](mailto:irb@eastern.edu), regarding: your rights as a research participant; problems or concerns; suggestions to improve the participant experience; you do not feel comfortable talking with the researcher.

You may contact the Eastern University IRB anonymously. The IRB may need to reveal information you provide in order to follow up if you report a problem or concern.

#### DO YOU WANT TO BE IN THIS STUDY?

By clicking YES below you agree to the following statement:

I have read this form, and have been able to ask questions about this study. The researcher has answered all my questions. I voluntarily agree to be in this study. I agree to allow the use and sharing of my responses as described above. I have not given up any of my legal rights as a research participant.

YES

NO