

Air Force Institute of Technology AFIT Scholar

Theses and Dissertations

Student Graduate Works

3-10-2010

The Development of a Leadership Self-Efficacy Measure

Seth D. Platt

Follow this and additional works at: <https://scholar.afit.edu/etd>

 Part of the [Leadership Studies Commons](#)

Recommended Citation

Platt, Seth D., "The Development of a Leadership Self-Efficacy Measure" (2010). *Theses and Dissertations*. 2118.
<https://scholar.afit.edu/etd/2118>

This Thesis is brought to you for free and open access by the Student Graduate Works at AFIT Scholar. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of AFIT Scholar. For more information, please contact richard.mansfield@afit.edu.



**THE DEVELOPMENT OF A LEADERSHIP
SELF-EFFICACY MEASURE**
THESIS

Seth David Platt, Captain, USAF
AFIT/GEM/ENV/10-M07

**DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY**

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States Government.

AFIT/GEM/ENV/10-M07

THE DEVELOPMENT OF A LEADERSHIP SELF-EFFICACY MEASURE

THESIS

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Engineering Management

Seth D. Platt, BS

Captain, USAF

March 2010

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

THE DEVELOPMENT OF A LEADERSHIP SELF-EFFICACY MEASURE

Seth D. Platt, B.S.
Captain, USAF

Approved:

- SIGNED -

24 Feb 10

Alexander J. Barelka, Lt Col, USAF (Chairman)

Date

- SIGNED -

24 Feb 10

Daniel T. Holt, Lt Col, USAF (Member)

Date

- SIGNED -

24 Feb 10

John J. Elshaw, Lt Col, USAF, (Member)

Date

Abstract

The construct of self-efficacy has been used extensively to analyze and predict what motivates human behavior, to include leadership behaviors. The connection between self-efficacy and leader effectiveness may be critical to finding new ways of selecting and developing leadership in organizations. The efficacy of individuals at the general and specific levels was studied with data collected from officer training school graduates and their post-training supervisors. With this data a new leadership self-efficacy (LSE) framework was created and validated, and this framework was used to compare the predictability of the previously validated general self-efficacy (GSE) measure to distal performance measures. GSE was found to be a poor predictor of future behaviors while an individual's self-efficacy for interpersonal skills was found to be a significant contributing factor to future leadership behaviors.

Acknowledgments

I would like to thank my classmates who helped me get keep my sense of humor, and my thesis committee who helped keep me on the right path, and most especially my family, who give me purpose and a reason to strive for my goals, and without whom this thesis would not have been possible.

Seth Platt

Table of Contents

	Page
<i>Abstract</i>	<i>iv</i>
<i>Acknowledgments</i>	<i>v</i>
<i>Table of Contents</i>	<i>vi</i>
<i>List of Figures</i>	<i>viii</i>
<i>List of Tables</i>	<i>ix</i>
<i>I. Introduction</i>	<i>1</i>
Research Objectives	<i>4</i>
<i>II. Literature Review</i>	<i>6</i>
The origins of self-efficacy	<i>6</i>
Self-Efficacy as a predictor of job-performance	<i>8</i>
General self-efficacy vs. Task-specific Self-efficacy	<i>8</i>
Self-Efficacy and Leadership	<i>9</i>
LSE Frameworks.....	<i>9</i>
Proposed LSE framework	<i>11</i>
Leadership Performance Measures	<i>14</i>
Hypotheses	<i>14</i>
<i>III. Methods</i>	<i>17</i>
Sample.....	<i>17</i>
Procedure.....	<i>17</i>
Measures.....	<i>17</i>
<i>IV. Analysis and Results</i>	<i>20</i>
Factorial Analysis for the LSE measure.....	<i>20</i>
Supervisor Ratings Measures.....	<i>22</i>
Correlations	<i>24</i>
Multiple Regression Models	<i>25</i>
Hypothesis test results.....	<i>29</i>
<i>V. Discussion and Conclusions</i>	<i>31</i>
Discussion	<i>31</i>

	page
Implications	32
Limitations	33
Future Research.....	33
<i>Appendix A. Retained General Self-Efficacy Questions</i>	<i>35</i>
<i>Appendix B. Scree plot of LSE data</i>	<i>35</i>
<i>Appendix C, Rotated Component Matrix of LSE data</i>	<i>36</i>
<i>Appendix D, Confirmatory Factor Analysis Model of LSE data</i>	<i>37</i>
<i>Appendix E, Retained LSE questions from factor analysis.....</i>	<i>38</i>
<i>Appendix F. Scree plot of performance data</i>	<i>39</i>
<i>Appendix G, Rotated Component Matrix of performance data</i>	<i>40</i>
<i>Appendix H. Retained Supervisor Questions from factor analysis.....</i>	<i>41</i>
<i>Appendix I. Confirmatory Factor Analysis Model of performance data</i>	<i>42</i>
<i>Bibliography</i>	<i>43</i>
<i>SF 298</i>	<i>49</i>

List of Figures

	Page
Figure 1, Component Aggregation for the new LSE model.....	12

List of Tables

	Page
Table 1, Pearson Correlations for LSE, GSE, and performance measure items	25
Table 2, Multiple regression of LSE factors with leadership performance measures	26
Table 3, Multiple regression of LSE factors with task performance measures	27
Table 4, Multiple regression of leadership performance with GSE and LSE	28
Table 5, Multiple regression of task performance measures with GSE and LSE.....	28

THE DEVELOPMENT OF A LEADERSHIP SELF-EFFICACY MEASURE

I. Introduction

Understanding why some people are more effective leaders than others has been a topic of thousands of research studies over the past half-century (Yukl, 1989, Gordon & Yukl, 2004). These studies have attempted to find an enhanced way to determine the factors, or predictors, that make an effective leader. Many such predictors have been explored over the years, including in-born traits (e.g. Ng et al., 2008), situational contexts (e.g. Gayle & Jan, 2002; Vecchio & Bullis, 2006), past experiences (e.g. Connelly et al. 2000; McCall, 2004), and internal motivations (e.g. Chan & Drasgow, 2001). Of these factors, some exist at the individual level and therefore cannot be manipulated or changed in order to improve leadership effectiveness, and others are path-dependant. These first three factors, while able to predict leadership effectiveness, are much less useful in leadership development. Therefore the fourth factor of internal motivation seems to hold the greatest potential to be manipulated and therefore improved in leaders. It is for this reason that internal motivations are of such great interest in leadership studies and why it will be explored in this thesis.

Although there are many factors that influence an individual's internal motivations (e.g. personality traits, social observations), few have been so thoroughly studied as self-efficacy (Bandura, 1986), and for good reason; self-efficacy has, in hundreds of studies, been positively linked to successful outcomes (e.g. Multon et al., 1991; Stajkovic & Luthans, 1998; Prussia et al., 1998; Hoyt et al., 2003). Self-efficacy has been defined as "beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (Wood & Bandura, 1989: 408). It has not only been positively tied to an individual's motivation to

pursue actions, but also to their contribution of greater effort towards those actions, and their perseverance in the face of obstacles (Bandura, 1997, Gist & Mitchell, 1992).

In the leadership literature, the self-efficacy of the leader has been given many names, including leader efficacy (e.g. Leithwood & Doris, 2008), leadership efficacy (e.g. Chemers et al., 2000), leader self-efficacy (e.g. Hannah et al., 2008: 670), and leadership self efficacy, (e.g. McCormick, 2001), all of which have been measuring the same concept of an efficacy that is associated with leadership-specific tasks. This paper will not make the distinction between these different naming conventions but will use the more common term Leadership Self-efficacy (LSE), which has been defined as “A person’s judgment that he or she can successfully exert leadership by setting a direction for the work group, building relationships with followers in order to gain commitment to change goals, and working with them to overcome obstacles to change” (Paglis & Green, 2002 pg 217).

It is important to note that researchers have investigated efficacy beliefs at differing levels of specificity (e.g. Eden, 1996). While efficacy theory originated for task-specific or state-like constructs, termed specific self-efficacy (SSE), some researchers have more recently developed a general or trait-like construct that is able to predict behaviors across various situations and has been termed general self-efficacy (GSE) (e.g., Eden, 1988, 1996; Gardner & Pierce, 1998; Judge et al., 1998). GSE has been defined as an “individuals’ perception of their ability to perform across a variety of different situations” (Judge, et al., 1998: 170) and is said to have the same antecedents as SSE, such as life experiences, verbal persuasion, and psychological states (Bandura, 1997), with the most influential being previous experiences (Shelton, 1990; Sherer et al., 1982). It has also been suggested that GSE is more resistant to short-term influences and

is thus more consistent over time than is SSE (Eden, 1988), although this thesis will challenge that assumption. It has also been suggested that there is a positive relationship between GSE and SSE (Shelton, 1990, Sherer et al., 1982), which will be another assumption challenged in this thesis.

Even though self-efficacy at various levels of specificity has been correlated to task success in many studies, some findings have also shown its predictability to be moderated by the specificity of the tasks performed (Stajkovic & Luthans, 1998), specifically with GSE measures (Pajares, 2009). To bolster these findings, theory suggests that GSE measures will have greater problems of predictive relevance than SSE (Bandura, 1997). Further, in order to have the greatest prediction of behavioral outcomes, a reasonably precise measurement of capability matched to a specific outcome must be used (Bandura, 1986).

It is clear from previous studies and theoretical works that both GSE and SSE measures have strengths and weaknesses in regards to predictability (Chen et al., 2001), but what is still unclear is to what degree and under what situational context each is an effective predictor of performance. In the field of leadership study there is a question as to whether GSE or SSE measures should be used to predict leadership abilities. While there are a great number of studies on both leadership and efficacy, “very little research is available that has assessed general and self (specific) forms of leader efficacy in the same study” (Hannah et al., 2008: 675). It is difficult to state with any confidence that one measure is better than the other if they have not been compared in the same study. To provide some answers to these questions, this thesis compared general and specific measures of efficacy to leadership performance.

Research Objectives

The connection between self-efficacy and leader effectiveness may be critical to finding new ways of selecting and developing leadership in organizations (Murphy, 2002). Moreover, it may be useful to predict leadership effectiveness and ultimately increase the effectiveness of individual leadership training programs. For these reasons, LSE has been the focus of many recent leadership studies (e.g. Anderson et al, 2008; Hannah et al, 2008; Paglis and Green, 2002). Hannah et al. (2008) proposed that greater levels of LSE lead to greater levels of leadership performance, but still felt this proposition had not been sufficiently validated. Despite the potential for a comprehensive LSE framework¹ to aid in the understanding a prediction of effective leadership in organization, Anderson et al. (2008) thought the literature has still failed to specify any useful, empirically derived taxonomic structure.

In order to address these issues, this research will meet the following objectives: (1) create and validate a comprehensive framework for LSE, (2) compare the predictability of the previously validated GSE measure and the newly developed LSE measure to distal, work-related leadership performance measures, and (3) explore the relationship between GSE, LSE, and leadership effectiveness.

This study will be different from previous studies because most have been performed at universities (e.g., Hoyt et al., 2003, Prussia et al., 1998) or in other non-work related environments (e.g., Chemers et al., 2000). The scarcity of work-related empirical studies has detracted from the ability to generalize the construct of efficacy to individual work performance (Harrison et al., 1997, Anderson et al. 2008). This study will improve upon previous efficacy studies by taking work-related measures of

¹ A “framework” is defined here as a theoretically or empirically-based grouping of aspects which can be used to better study a given concept

performance. A second difference in this study from previous research is that most previous studies take measures of efficacy proximal to performance ratings (e.g. Anderson et al., 2008). It has been theorized that temporal differences between self-efficacy measurements and the actions measured may detract from the long-term predictability of such constructs (Bandura, 1986). This may not be the case for GSE and LSE, as this study will show by collecting performance ratings between one and two years after the efficacy measures are collected.

II. Literature Review

The origins of self-efficacy

“The capacity to exercise control over the nature and quality of one’s life is the essence of humanness” (Bandura, 2001: 1). The ways in which we are able to exercise such controls is at the heart of Albert Bandura’s Social Cognitive Theory (SCT), which in turn has been the basis for many recent studies exploring individual motivations.

According to these studies, we are not simply beholden to our environment or slaves to our own genetic makeup, as earlier behavioristic theory would suggest (Edwards, 1972). Rather, we play a much more active role in shaping our own thoughts, which in turn shape our actions (Locke, 1991). Therefore, in order to be successful in a complex world people must make sound judgments concerning their own capabilities, anticipate potential problems, understand others motivations, and use this information to determine what actions they will take (Bandura, 2001). This study focuses on the judgments individuals have concerning their own capabilities and how those judgments effect future leadership actions.

Human behavior is not simply a response to external stimuli, according to SCT; neither is it governed solely by internal cognitions, but rather functions in a triadic exchange between the environment, behaviors, and internal cognitions. Accordingly, all actions can be determined by various influences between these three elements (Bandura, 1986). SCT also focuses on the social origins of thought, or put another way; the ways in which behaviors are learned through direct observation of others behaviors. It has been used extensively to explain individual motivations for task performance between the factors of the environment, people’s behaviors, internal cognitions, and how people learn (Ng et al., 2008).

In developing his SCT, Bandura added the dimension of self-beliefs to the working theory of internal cognitions. This portion of the theory was based on his observation that people are not easily influenced to change their actions. The conclusion, therefore, was that some internal anchor of self-beliefs must be at play because “people possess self-directive capabilities that enable them to exercise some control over their thoughts, feelings, and actions by the consequences they produce for themselves” (Bandura, 1986: 335), and most influential of these self-beliefs is that of self-efficacy (Bandura, 1986).

The construct of self-efficacy has been used extensively to analyze and predict what motivates human behavior (Harrison et al., 1997), yet even before SCT was developed people understood that an individual’s personal beliefs played a large role in their ability to perform tasks (e.g. Kipnis & Lane, 1962). Before Bandura published his SCT, researchers used self-confidence in their work, which is a self-measure of a person’s capabilities and skills, or their perceived competence to deal successfully with the demands of a variety of situations (Shrauger & Schohn, 1995). While closely associated with self-efficacy, self-confidence is said to be more of a general self efficacy, but has not been used for building models of human performance because it is “not a construct embedded in a validated theoretical system specifying its determinants, processes, and effect” (McCormick, 2001: 23). Another reason self-confidence has taken a back seat to efficacy is that it is understood to be a something used to describe or predict behavior, not something that can be changed or influenced (McCormick, 2001).

Self-efficacy, especially in task-specific constructs, has the ability to be molded and manipulated, which lends to more applications of the construct.²

Self-Efficacy as a predictor of job-performance

Numerous research articles have shown a strong positive relationships between self-efficacy and performance (Hannah et al., 2008), and that efficacy is a good predictor of several work-related outcomes, including job attitudes (Saks, 1995), training proficiency (Martocchio & Judge, 1997), academic outcomes (Multon et al., 1991), and job performance (Stajkovic & Luthans, 1998). The meta-analytic work of Stajkovic and Luthans, found a correlation between self-efficacy and performance of .38 (1998). This same study found the relationship between efficacy and performance to be moderated by the specificity of the tasks; giving less predictability to more complex tasks. This seems to be a small point, but given that leadership is a complex task, this study would seem to suggest that general self-efficacy would be a less effective predictor of performance in leadership tasks than task-specific efficacy measures.

General self-efficacy vs. Task-specific Self-efficacy

Research suggests that specific self-efficacy (SSE) has discriminate validity from general self-efficacy (GSE) (Chen et al., 2001), indicating that there is a difference between the two constructs. More specifically, “role trait measures are often much more related to role behaviors than general trait measures in cross-sectional analyses” (Wood, 2007: 1103). In many studies the absence of specificity in assessments has been shown to reduce the predictability of general self-efficacy measures (Pajares, 2009). Leadership

² The more general forms of self-efficacy can be said to be very closely related to self-confidence, as both are understood to be less influenced by short-term stimuli and therefore more constant over time than specific forms of self-efficacy. This study compares general self-efficacy rather than self-confidence to task-specific self-efficacy in order to maintain consistency in measures.

is widely viewed as requiring complex cognitive and social problem solving skills (Yukl, 2002), requiring leaders to “continually ‘step up’ to meet complex challenges” (Hannah et al., 2008: 669), it is not unreasonable to predict that more specific leadership-related measures of self-efficacy would better predict leadership performance.

Self-Efficacy and Leadership

LSE has been defined as “A person’s judgment that he or she can successfully exert leadership by setting a direction for the work group, building relationships with followers in order to gain commitment to change goals, and working with them to overcome obstacles to change” (Paglis & Green, 2002: 217). Like other task-specific self-efficacy measures, the relationship between LSE and work outcomes may be explained by highly self-efficacious leaders tending to undertake more responsibilities, investing more effort in their work, and persisting longer when met with difficulties (Paglis & Green, 2002). To explore this theory, efficacy as it relates to leadership-specific tasks has recently become a focus of empirical research (Hannah et al., 2008). There is even evidence to suggest that LSE has a capability to predict relevant work outcomes (Hannah et al., 2008) such as motivation to lead (e.g. Chan & Drasgow, 2001), organizational commitment (Paglis & Green, 2002), and performance ratings (e.g. Chemers et al., 2000, Luthans & Peterson, 2002; Robertson & Sadri, 1993). It is because of studies like these that this study is able to develop a robust, theoretically-base measure for LSE.

LSE Frameworks

Hannah et al. (2008) proposed that greater levels of LSE lead to greater levels of leadership performance. It has further been proposed that efficacy and other positive psychological states promote effective leader engagement, flexibility, and adaptability

(Hannah and Luthans, 2008). Carver and Scheier (1998) and Lord and Brown (2004) suggested that efficacy does this by providing internal guidance and drive to create the mental state required to take on difficult and challenging tasks. In short, higher self efficacy leads to positive thinking and thus the pursuit and completion of more difficult tasks.

In order to test these proposals, a comprehensive framework must first be developed. Developing such a construct has been the focus of many recent leadership studies (e.g. Anderson et al, 2008; Hannah et al, 2008; Paglis and Green, 2002). Despite the potential for a comprehensive LSE framework to aid in the understanding a prediction of effective leadership in organization, the literature has still failed to specify any useful, empirically derived taxonomic structure (Anderson et al., 2008).

Paglis and Green (2002) developed an LSE taxonomy that has been lauded as one of the first externally valid study (Anderson et al., 2008: 596), in which they used three main components, each measured with 4-items. The three components were based on their definition of LSE and were (a) setting direction, (b) gaining commitment, and (c) overcoming obstacles to change. While this definition of LSE has been used extensively (e.g. Anderson et al, 2008; Hannah et al., 2008), the measure used to validate it has been criticized for having a framework that was too constrained and for having a rationally-derived taxonomy based upon a small sample of prior research (Anderson et al., 2008: 596), and so was improved upon by later researchers.

Building upon the work of Paglis and Green (2002), Anderson et al. (2008) derived their own taxonomy from 88 attributes of leadership based upon various interviews of corporate leaders. Those 88 items were then distilled into an 18 component model for LSE, which were self-efficacy for: *change, drive, solve, build, act, involve,*

self-discipline, relate, oversee, project credibility, challenge, guide, communicate, mentor, motivate, serve, convince, and know (see Table 1). Two criticisms of this research, as addressed by the authors, included having too many factors to be practical, and the lack of generalizability due to the limitations of the sample, which were from a single financial institution (Anderson et al., 2008: 600). Clearly, to benefit the practitioner, a simpler and more practical taxonomy is needed.

Hannah et al. (2008) developed a framework for LSE consisting of only four domains that they referred to as “Generalized Leader Efficacy”, which included leader efficacy for thought, leader efficacy for action, leader efficacy for self-monitoring, and leader efficacy for means. This framework, however, was derived from previous LSE theory, not empirical data and has not yet been validated.

Proposed LSE framework

The LSE framework developed for this study draws from various components of previous studies (e.g. Anderson et al. 2008; Hannah et al. 2008; Paglis and Green, 2002). This four component model includes leader efficacy for thought, action, self-motivation, and interpersonal skills. These components of the new LSE model were created by combining similar elements from previous research into a more parsimonious model (figure 1). For example, many of the components from Anderson et al. (2008) encompass similar LSE components to the Hannah et al. study and Paglis and Green (2001) (e.g. the components of “solve” and “know” seem to relate to Hannah’s definition of “leader efficacy for thought” and Paglis & Green’s “direction setting”). One component that was removed was that leader efficacy for means from the Hannah et al. (2008) model. Eden (2001) postulates that the influences of means efficacy may be domain-specific, and that jobs involving heavy use of external means may be predicted

more by means efficacy than self-efficacy. As a result, its usefulness as a generalizable component of LSE is limited and for this reason it was consequentially not included in the new LSE model.

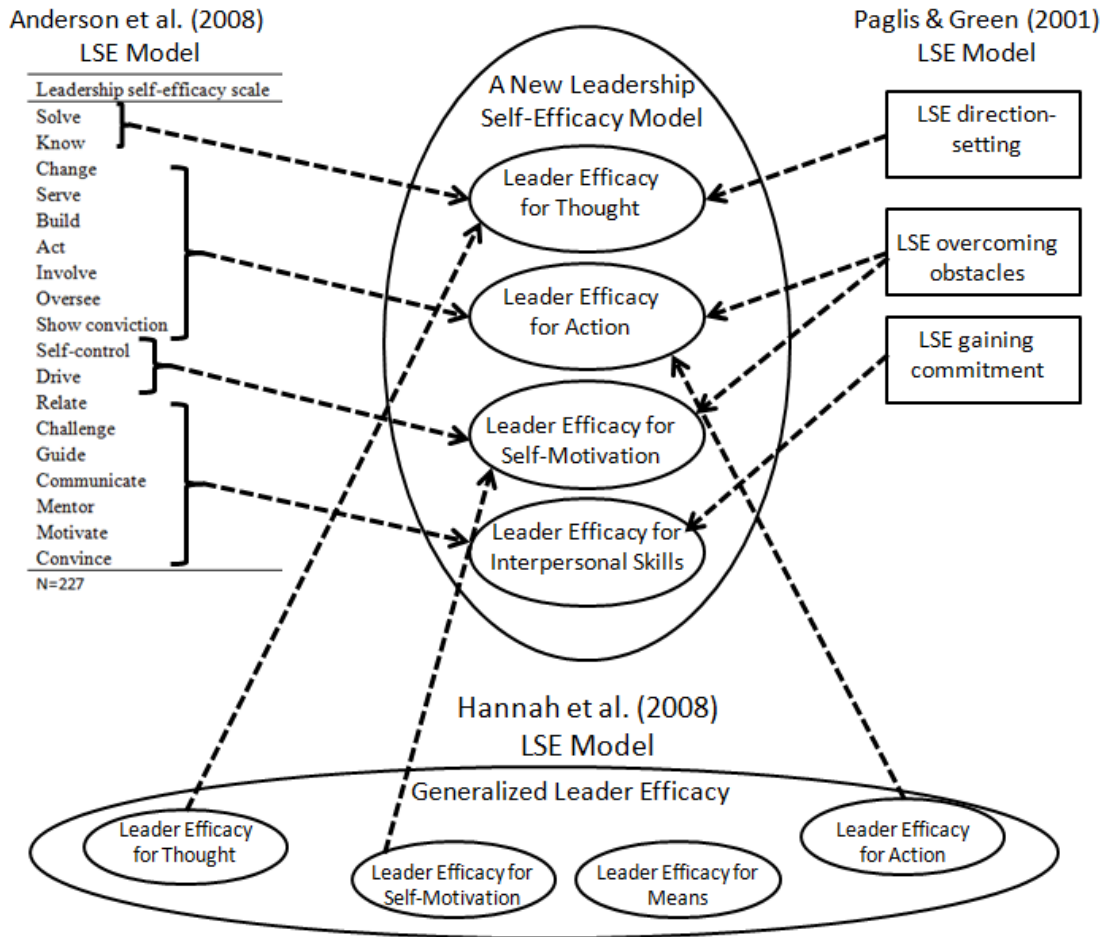


Figure 1, Component Aggregation for the new LSE model
From the Anderson et al. model, Hannah et al., and Paglis & Green LSE models

Looking closely at the definitions of the LSE components given by Anderson et al. (2008), the 18 component LSE model can be aggregated into four components, three of which are common in all three studies, (i.e. self-efficacy for thought, action, and self-motivation). The remaining components from Anderson et al. (2008) (i.e. relate, challenge, guide, communicate, mentor, motivate, convince) can be aggregated into one concept of “self-efficacy for interpersonal skills”, which is nearly identical to “LSE

gaining commitment” in the Paglis & Green (2001) model. The new LSE measure of efficacy for interpersonal skills is defined as the leader’s perceived ability to communicate and interact socially with people in order to reach a certain desired result.

The next component of the new LSE model is leader efficacy for action, which is a leader’s confidence in their abilities to take action to effect positive change (Parry, 1998). Prior research of LSE has focused primarily on action forms of efficacy (e.g. Beauchamp et al., 2007; Chemers et al., 2000; Paglis and Green, 2002) because a leader’s actions are the most easily identifiable part of leadership. It is for this reason this thesis includes efficacy for action in the new LSE model.

It has been proposed, however, that exclusive focus on the action or behavior forms of efficacy is insufficient to explain how LSE is developed and how it manifests in the complex dynamics of the leader (Hannah et al., 2008). Every action taken requires some forethought, which is why the next component is the leader efficacy for thought. This is the leader’s self-confidence concerning their ability to produce effective solutions to overcome leadership challenges and dilemmas, and also includes efficacy for learning. Proper leadership has been widely seen as needing problem solving skills (Yukl, 2002), and efficacy beliefs regarding cognitive ability has been understood to play an important role in the generation of effective solutions (Bandura, 1989). As such, efficacy for thought has been a central theme in other leadership capability models (e.g. Conway, 2000; Mumford et al., 2007).

The final component of the model is that of leader efficacy for self-motivation, which has been defined as “the product of the exercise of forethought that allows envisioned successful future outcomes to become a source of motivation to regulate current behaviors” (Hannah et al., 2008: 677). This self-motivation efficacy has been an

important part of many leadership theories, including identity processes (e.g. Lord & Brown, 2004), transformational leadership (Avolio, 2002), motivation-to-lead (Chan & Drasgow, 2001), self-leadership (Manz, 1986), and managerial role-motivation (Miner, 1993). Self-motivation has also been suggested to be a separate component of self-efficacy that contributes to goal-setting independent of one's abilities (Kane et al., 2002).

Leadership Performance Measures

Two categories of performance will be used in this thesis; leadership and task performance. Leadership performance is measured by how well an individual manages programs and motivates others to perform the desired tasks in order to obtain the leaders goals. These measures of leadership have been the subject of multiple leadership studies (e.g. Dixon, 2009; Howell and Shamir, 2005; Dvir and Shamir, 2003; Dvir et al. 2002).

The second measure of performance is how well an individual performs certain tasks. Like leadership performance, task performance has also enjoyed a substantial amount of attention in past studies (e.g. Tabernero et al, 2009; Hackman and Wageman, 2005; Eriksen, 2001; Marion and Uhl-Bien, 2001; Durham and Locke, 1997; Halpin and Winer, 1957). Task performance is measured by the time required for the task as well as quality of the work, and is distinguished from leadership performance because it focuses on individual performance measures rather than the performance of a group.

Hypotheses

Five hypotheses are put forth regarding the predictability of future leadership performance from self efficacy measures, based on the four components of the new LSE model and previously published GSE measures. The first hypothesis relates to a leader's efficacy for thought, which is the leader's self-efficacy concerning their ability to produce effective solutions to overcome leadership challenges and dilemmas and also

includes efficacy for learning. Proper leadership has been widely seen as needing problem solving skills (Yukl, 2002), and efficacy beliefs regarding cognitive ability has been understood to play an important role in the generation of effective solutions (Bandura, 1989). Therefore, people who believe they have the capability to think through complicated problems and find successful solutions will perform better.

Hypothesis 1: Leadership efficacy for thought will be positively related to leadership effectiveness and task effectiveness.

A leader's efficacy for action is a leader's confidence in their abilities to take actions that will lead to positive outcomes (e.g. Beauchamp et al., 2007; Paglis and Green, 2002; Chemers et al., 2000 Parry, 1998). Leaders must be inclined to think they can take appropriate action in order to be effective leaders, and therefore a positive link between efficacy for action and both performance measures is expected in this research.

Hypothesis 2: Leadership efficacy for action will be positively related to leadership effectiveness and task effectiveness.

Leader efficacy for self-motivation is the leader's perceived ability to develop the internal motivations required to lead successful future endeavors. This self-motivation efficacy has been an important part of many leadership theories, including identity processes (e.g. Lord & Brown, 2004), transformational leadership (Avolio, 2002), motivation-to-lead (Chan & Drasgow, 2001), self-leadership (Manz, 1986), and managerial role-motivation (Miner, 1993). The expected outcome of this research therefore, is that individuals with high efficacy for self-motivation will have superior performance outcomes.

Hypothesis 3: Leadership efficacy for self-motivation will be positively related to leadership effectiveness and task effectiveness.

Motivating followers to perform desired actions requires interpersonal skills, which is a concept that has been understood to be an important part of leadership in multiple studies (e.g. Dunnette, 1971; Bray et al., 1974; Mumford et al., 1991; Friedman et al., 1992; Connelly et al., 2000). Dunnette (1971) identified several commonalities in leader characteristics related to later managerial success, of which interpersonal skills was one. Bray et al. (1974) conducted a study to examine skills and abilities related to an individual's advancement to middle management, in which he found human relations skills and oral communication to be good predictors. Mumford et al. (1991) found social skills to be among the most stable predictor of leadership positions in college. Friedman et al. (1992) linked, along with cognitive abilities, social judgment skills to performance of critical leadership tasks. These past studies support the idea that interpersonal skills play a significant role in effective performance.

Hypothesis 4: Leadership efficacy for interpersonal skills will be positively related to leadership effectiveness and task effectiveness.

Theory suggests that general measures of efficacy might not be the best method available to predict specific behaviors (Bandura, 1997), and that in order to have the greatest prediction of behavioral outcomes, a reasonably precise measurement of capability matched to a specific outcome must be used (Bandura, 1986). Along these lines of thought, it is expected that GSE will not be as good of a predictor of leadership behaviors as LSE measures.

Hypothesis 5: LSE will better predict performance than GSE for leadership effectiveness and task effectiveness.

III. Methods

Sample

The sample consisted of 318 individuals who were officer candidates for a commission in the Air Force. They went through a twelve-week Officer Training School (OTS) program between 1994 and 1997. Of the 318 students who took the survey, 317 were complete and useable. The training program was designed to train new military recruits between the ages of 21 to 35 to be officers in the United States Air Force. Candidates who successfully completed the training were commissioned as officers. The mean age of the candidates was 26.7, (SD= 3.1) with 15 percent of the candidates being female. Surveyed candidates all had undergraduate degrees from various universities.

The sample also consisted of 788 supervisors of graduated candidates. Of the original 788 supervisors surveyed, only 97 surveys were able to be matched to the original 317 complete and usable candidate surveys. Therefore the final n used to test the hypotheses was 97.

Procedure

Participants completed surveys that included measures of general and leadership-specific self-efficacy, all of which were given within the first week of training. Surveys were then sent to the supervisors of the graduates between one and two years after the candidates graduated from OTS. These surveys asked for feedback on the graduate's performance as compared to other officers in the unit.

Measures

All measures were taken through self-reports using pen-and-paper methods. OTS candidate measures of GSE and LSE were collected by the surveyors immediately after

completion. Supervisor rating measures were sent through the mail and returned in the same manner.

General efficacy was measured with an existing 17-item general self-efficacy measure which was first proposed by Sherer et al. (1982). Participants were asked to rate the degree to which they agree or disagree with each statement. The measure was set on a Likert scale of one to seven, one being strongly disagree and seven being strongly agree. Measures were compiled and the means calculated for all 17 items ($N = 317$, $M = 2.2$, $SD = 0.82$). The GSE scale consisted of six positively phrased items such as “When I make plans, I am certain I can make them work”, and 11 negatively phrased such as “I give up on things before completing them”. Of the 17 item measure, only the 11 reverse coded questions were retained and used in the correlation study, as is consistent with suggestions of question retention from previous studies (e.g. Deemer and Minke, 2001; Weems and Onwuegbuzie, 2001). A list of the 11 retained GSE questions can be found in Appendix A. Internal consistency was measured from the 11 questions using Cronbach’s Alpha, was .84.

The proposed measure for LSE consisted of a 40-item survey whose measures targeted leadership-specific activities needed by leaders in order to be successful in their careers. Candidates were asked to rate each item by the degree of confidence they had in themselves to perform the various activities. All items were rated using a Likert scale ranging from zero to ten, zero representing having no confidence in their ability to perform, five representing somewhat confident, and ten representing extremely confident in their own ability to perform. All items were positively phrased; an example of a typical question was “how effectively could you resolve conflicts between members of the unit *today*, if you were asked to?”

Performance Ratings were collected through surveys sent to the supervisors of each of the graduates. The surveys consisted of 38 questions comparing the participant to other officers in the unit. Various questions, such as “compared to other officers, how effective is the officer in managing time?” were given on a Likert scale from one to seven, one being much below average and seven representing much above average. Zero was also an option, representing does not apply.

IV. Analysis and Results

Factorial Analysis for the LSE measure

An exploratory factor analysis was performed using all 40 LSE questions, as it is a consistent practice in organizational behavior studies (Conway & Huffcutt, 2003, Ford et al., 1986, Fresco et al., 2007). A scree-plot (Cattell, 1966) was generated using SPSS (Appendix B), which showed an inflexion point between the fourth and fifth items. This indicated that a four-factor model was the most appropriate. The scree plot method is understood to be a reliable criterion for factor retention (Stevens, 1992) and has been found to be a more valid method of factor retention than using the eigenvalues greater than one method (Floyd and Widaman, 1995), thus was chosen for this research.

Subsequent analysis by orthogonal rotation was constrained to four factors. Suppressing all factors with absolute values less than .4, as recommended by Field (2005), resulted in the four-factor rotated component matrix shown in Appendix C. From these results, items with loadings less than .5 were removed (Stevens, 1992) along with those with a high degree of cross loading (Tabachnick and Fidell, 2001). Ultimately, based on face-validity apparent during item selection (Hinkin, 1998) and factor loadings, 25 items were retained from the 40 original items. The remaining items loading on each of the four factors were then analyzed and labeled.

The first factor contained the following items: Take Responsibility, put extra effort into a task, exercise personal discipline, ensure work is done right, get work done on time, follow the supervisor's instructions, and pay attention to details. These seven items allude to an internal desire or motivation to perform well. This is consistent with the definition of Leadership Efficacy for Self-Motivation, which is defined as the product

of the exercise of forethought that allows envisioned successful future outcomes to become a source of motivation to regulate current behaviors (Hannah et al., 2008: 677).

The second factor contained the following items: anticipate potential problems, guide and direct subordinates, counsel others, provide appropriate feedback to subordinates, resolve conflict between members of the unit, coordinate subordinates' efforts to minimize conflicts, assign duties appropriate for subordinate's abilities, and create a productive unit atmosphere, all eight of which are actions needed to be a successful leader. This is consistent with the definition of Leadership Efficacy for Action, which is a leader's confidence in their abilities to take action to effect positive change (Parry, 1998).

The third factor contained the following items: collect and interpret information, use technical material appropriately, defend a supervisor's decision, and provide others with current technical information. All four of these items require a need for cognitive skills more than simply action, and therefore are consistent with the definition of LSE for thought, which is the leader's self-confidence concerning their ability to produce effective solutions to overcome leadership challenges and dilemmas.

The fourth and final factor contained the following items: Cooperate with others in the team, get along with others, lend a hand when a coworker needs it, praise coworkers when they are successful, display concern for others, and consider others needs before acting. These six items require one-on-one interaction between the leader and follower and cannot be successful without good social skills. Because of this, these items were labeled as LSE for interpersonal skills, which is defined as the leader's perceived ability to communicate and interact socially with people in order to reach a certain desired result. These four factors were tested for reliability. Efficacy for action,

thought, internal motivation, and interpersonal skills all had associated Cronbach's Alpha measures of .90, .74, .83 and .80 respectively.

In order to provide a more precise test of the LSE measure's underlying structure, (Byrne, 2001; Hoyle, 2000; Long, 1983; Maruyama, 1998), a confirmatory Factor Analysis (CFA) was performed on the four-factor LSE model using AMOS (Version 6) software. Performing a CFA after an initial EFA is common in many studies (e.g. Fresco et al., 2007); as stated by Sansone et al. "the development of a measure often begins with EFA and moves to CFA" (2004: 155). After removing nine items that exhibited loading values less than .7 (Netemeyer et al., 2003: 153), the 16-item, four-factor LSE model was verified as a good model (see appendix D for printout) with a Chi-squared of 2.8, a comparative fit index (CFI) of .91, and a Root Mean Square Error of Approximation (RMSEA) of .076. The final 16 questions retained for the correlation study are listed in Appendix E. Reliabilities were recalculated for each of the four paired down factors. LSE for action, interpersonal skills, thought, and self-motivation, had associated Cronbach's Alpha measures of .87, .77, .77, and .78 respectively, and are reported in table 1.

Supervisor Ratings Measures

An exploratory factor analysis was performed using all 38 leadership performance questions from the supervisor surveys. A scree-plot (Cattell, 1966) was generated using SPSS (Appendix F) which showed an inflexion point between the third and fourth item, indicating that a three-factor model was the most appropriate. Subsequent analysis by orthogonal rotation extracting three factors and suppressing absolute values of less than .4, as recommended by Field, 2005, resulted in the rotated component matrix in Appendix G. From these results, factors with loadings less than .5 were removed

(Stevens, 1992) along with those with a high degree of cross loading (Tabachnick and Fidell, 2001). Ultimately, based on the face-validity apparent during item selection (Hinkin, 1998) and factor loadings, 25 items were retained from the original 38. The remaining items loading on each factor were then analyzed and labeled.

The first factor contained the following items: Managing time, anticipating potential problems, making sure work is done right, initiating improvements, prioritizing work, performing consistently and reliably, overcoming obstacles, making decisions that require judgment, getting things done, finding answers to difficult questions, knowing what the priorities are, understanding what he/she is expected to do, taking charge at appropriate times, and solving problems. All of these fourteen items fall into the category of task behavior, which focuses on the individual and how well they perform a set task. Because of this these items were labeled as task behavior. The reliability for this measure was taken using Cronbach's Alpha, and was determined to be .97.

The second factor contained the following items: cooperating with others, maintaining good working relationships, showing respect for others, supporting unit morale, considering other's needs, setting the example for subordinates, helping someone who needs it, enforcing dress and appearance standards, and supporting human relations programs. These items are all measurement of how well an individual manages programs and motivates others to perform the desired tasks in order to obtain the leaders goals, which is the definition of leadership performance. Because of this these items were labeled as leadership performance measures and the Cronback's Alpha for the measure was determined to be .95.

The third factor included fewer items such as delivering a briefing, speaking before a group, and writing reports, which are all measures for effective communication.

Because existing measures for communication did not fall within the scope of this research the factor was removed from the model.

In order to provide a more precise test of the performance measure's underlying structure (Byrne, 2001; Hoyle, 2000; Long, 1983; Maruyama, 1998), a confirmatory Factor Analysis (CFA) was performed on the two-factor LSE model using AMOS (Version 6) software. After removing two items that exhibited loading values less than .7 (Netemeyer et al., 2003: 153), the 23-item, two-factor performance model was verified as a good model (see Appendix I for printout) with a Chi-squared of 5.6, a CFI of .94, an RMSEA of .078. The final 23 questions retained for the correlation study are listed in Appendix H. Reliabilities were recalculated for both of the paired down factors. Leadership performance and task performance measures had associated Cronbach's Alpha measures of .94, and .98 respectively, which are reported in Table 1.

Correlations

The single GSE and the four LSE measures were correlated to the two supervisor rating factors (Table 1). The mean and standard deviations were also calculated, as well as the coefficient alphas. The leadership measure was significantly correlated to interpersonal skills but no other factors. Task performance measure was significantly correlated to LSE for action, interpersonal skills, and self-motivation. Only LSE for thought was not significantly correlated to either of the measures. The GSE measure was not significantly correlated to any of the performance measures, but was significantly and negatively correlated to all four LSE measures.

Table 1, Pearson Correlations for LSE, GSE, and performance measure items

Variable		M	SD	1	2	3	4	5	6	7
1	GSE	2.2	0.82	(.84)						
2	Measure for Leadership	5.8	0.98	-0.04	(.94)					
3	Measure for Task Performance	5.6	1.02	-0.10	0.82**	(.98)				
4	Action LSE	7.8	1.25	-0.45**	0.22*	0.27**	(.87)			
5	Interpersonal Skills LSE	8.8	0.92	-0.32**	0.30**	0.25**	0.57**	(.77)		
6	Thought LSE	8.1	1.15	-0.33**	0.19*	0.19*	0.50**	0.31**	(.77)	
7	Self-Motivation LSE	8.7	0.88	-0.54**	0.20*	0.27**	0.64**	0.62**	0.44**	(.78)

Note * $p < .05$, ** $p < .01$, $n = 97-318$, Coefficient Alpha are shown in parenthesis on diagonal
M = mean, SD = standard deviation

Multiple Regression Models

A multiple regression was also performed on the data, the results of which are shown in Tables 3 and 3. Each performance measure was regressed with the four LSE factors in four steps. This step regression demonstrates how the addition of multiple LSE factor increases the variability explained in the two different measures of leadership. For instance, table 2 shows that LSE for Action explains only about 5 percent of the variability ($R^2 = .05$) in the leadership measure, and adding LSE for thought increases the explained variability by less than one-half of one percent ($\Delta R^2 = .004$), and adding LSE for self-motivation even less ($\Delta R^2 = .003$). Adding LSE for interpersonal skills, however, nearly doubles the explained variability ($\Delta R^2 = .042$), which indicates that the interpersonal factor of the LSE measure is more significant than the other three.

Table 2, Multiple regression of LSE factors with leadership performance measures

	B	SE B	β	R²/ΔR²
Step 1				
Constant (Leadership)	4.50	0.61		
LSE for Action	0.17	0.08	.22*	.048*
Step 2				
Constant (Leadership)	4.22	0.74		
LSE for Action	0.13	0.10	.17	
LSE for Thought	0.07	0.11	.08	.053/.004
Step 3				
Constant (Leadership)	3.83	1.04		
LSE for Action	0.09	0.12	.12	
LSE for Thought	0.06	0.11	.07	
LSE for Motivation	0.09	0.16	.08	.056/.003
Step 4				
Constant (Leadership)	2.93	1.12		
LSE for Action	-0.00	0.13	-.00	
LSE for Thought	0.06	0.11	.07	
LSE for Motivation	-0.03	0.17	-.03	
LSE for Interpersonal	0.30	0.15	.29*	.097/.042*

* $p < .05$

Also of note are the b-values, which indicate the individual contribution of each predictor to the model. LSE for interpersonal skills is significantly larger (0.30) than the other three predictors, indicating that these two factors contribute much more to the model and have a greater effect on the outcome of the performance measures. Another important measure are the beta values (β), which are the number of standard deviations that the outcome will change as a result of one standard deviation change in the predictor. In step four, changes in SSE for interpersonal skills has the largest impact on the dependent variable and is the only one with significance at the .05 level, indicating that SSE for interpersonal skills is the only factor to have a significant impact on leadership success.

The second regression was a step regression of the task performance measure (table 3). The R^2 values show that the majority of the variability is explained by the LSE

for Action factor, although four other predictors have similar b-values. The exception is that of LSE for thought, which has much lower b-values than the other predictors, indicating that this factor does not contribute to the task performance measure.

Table 3.

Table 3, Multiple regression of LSE factors with task performance measures

	B	SE B	β	R²/ΔR²
Step 1				
Constant (Task)	4.04	0.60		
LSE for Action	0.21	0.08	.27*	.073*
Step 2				
Constant (Task)	3.92	0.74		
LSE for Action	0.19	0.10	.25*	
LSE for Thought	0.03	0.11	.04	.074/.001
Step 3				
Constant (Task)	3.15	1.03		
LSE for Action	0.12	0.12	.16	
LSE for Thought	0.01	0.11	.01	
LSE for Motivation	0.17	0.16	.15	.085/.011
Step 4				
Constant (Task)	2.80	1.12		
LSE for Action	0.08	0.13	.11	
LSE for Thought	0.01	0.11	.01	
LSE for Motivation	0.13	0.17	.11	
LSE for Interpersonal	0.12	0.15	.11	.091/.006

* $p < .05$

Steps three and four of the regression exhibit no significant beta values and the .05 level, which indicates that no single factor contributed significantly to changes in the performance measure. Overall, the four factors are able to explain less than ten percent ($R^2=.091$) of the variability in the task performance measure.

A regression of GSE was also performed for leadership performance (table 4) measures. This was done in two steps, with the second step adding all four LSE measures in order to show whether the LSE model still has significance after controlling GSE. For the leadership performance regression, GSE is not able to explain any

significant change in variability of the measure ($R^2=.001$) while the LSE model explains about eleven percent of the variability ($R^2=.108$). Regressed without the LSE measures, GSE has an insignificant b-value (-0.05), as well as an insignificant beta value (-.04).

Table 4, Multiple regression of leadership performance with GSE and LSE

	B	SE B	β	$R^2/\Delta R^2$
Step 1				
Constant (Leadership)	5.92	0.33		
Measure for GSE	-0.05	0.14	-.04	.001
Step 2				
Constant (Leadership)	1.87	1.50		
Measure for GSE	0.17	0.16	.13	
LSE for Action	0.01	0.13	.02	
LSE for Thought	0.07	0.11	.09	
LSE for Motivation	0.03	0.18	.03	
LSE for Interpersonal	0.30	0.15	.29*	.109/.108*

**p<.05*

Looking at the similar regression of task performance (table 5), GSE is also insignificant in all measures and is not able to explain any significant variation in the task performance measure ($\Delta R^2=.001$). LSE is able to explain almost nine percent of the variation in the measure ($\Delta R^2=.087$). Beta and b-values are also insignificant for GSE in both steps of the regression.

Table 5.

Table 5 Multiple regression of task performance measures with GSE and LSE

	B	SE B	β	$R^2/\Delta R^2$
Step 1				
Constant (Task)	5.94	0.33		
Measure for GSE	-0.13	0.14	-.10	.010
Step 2				
Constant (Task)	2.01	1.52		
Measure for GSE	0.12	0.16	.09	
LSE for Action	0.10	0.13	.12	
LSE for Thought	0.02	0.11	.02	
LSE for Motivation	0.17	0.18	.15	
LSE for Interpersonal	0.11	0.15	.11	.097/.087*

**p<.05*

Hypothesis test results

Hypothesis one, which stated that LSE for Thought would be related to both performance measures, was not found to be true. This finding indicates that the thought component of LSE is not a good predictor of future performance in the areas of leadership or task performance, thus hypothesis one was rejected.

The second hypothesis stated that LSE for action would be related to both measures of performance. The multiple-regression indicated that this factor was insignificant for leadership and task performance measures, therefore hypothesis two was rejected.

The third hypothesis tested stated that LSE for Self-Motivation and the two performance measures would be related. As with the second hypothesis, LSE for Self-Motivation was not significant for the leadership performance measure. It was the strongest factor in the task performance measure, though not significantly. Therefore hypothesis three was rejected.

Hypothesis four, which predicted the relationship between LSE for interpersonal skills and both performance measures was partially upheld through the regression testing. The first regression performed with the leadership performance measures did show a significant relationship existed between the two measures. LSE for interpersonal skills was not, however, significant when regressed with the task performance measure, nor one of the strongest components. For this reason hypothesis four was partially rejected.

As predicted in hypothesis 5, LSE was shown to be a better predictor of leadership and task performance measures, as indicated by the regressions performed. While GSE did have larger B and beta values than some of the individual components of

LSE, such as LSE for thought, the four factors of LSE together had higher cumulative values than GSE in all measures. Therefore hypothesis five was not rejected.

V. Discussion and Conclusions

Discussion

Although only one of the five hypotheses was not rejected, there are some interesting and potentially significant items that can be drawn from this study. LSE for interpersonal skills seems to be the best predictor of leadership performance, while no one predictor stood out for task performance. This seems to indicate that efficacy for interpersonal skills is the deciding factor when it comes to leadership success, even above efficacy for thought, action, and self-motivation. LSE for action, thought, and self-motivation were found to be insignificant predictors of future behavior, leaving LSE for interpersonal skills as the sole significant predictor of future leadership behavior. This does not indicate, however, that the three other factors of LSE are without value, as all four factors of LSE together were able to account for nearly ten percent of the variability in both performance measures. LSE for thought was the only factor with little to no value for both measures, and can be removed from the model without any significant change in predictability of the model.

For practitioners who would like to predict future success in leaders for their organization, they may want to consider a test of efficacy for interpersonal skills; although this won't necessarily predict task performance. For those that would like to predict task performance, a measure of efficacy for action, self-motivation, and interpersonal skills may be the best predictor. For those organizations that would like to improve leadership abilities, increasing efficacy for interpersonal skills may be the best way to do it according to this research. Training that focuses on and gives exposure to a variety of interpersonal skills may be the most effective and efficient way to increase the success of the organization. For those organizations that would like to improve the task

performance of its members, training that improves the efficacy of action, self-motivation, and interpersonal skills may be the most effective method.

It is interesting to note the strong correlation between the four LSE factors and GSE. The data seems to demonstrate that individuals with low general efficacy do better in the first few years as a leader than do those with high efficacy. GSE seems to predict poor performance rather than good performance, which is contrary most studies concerning GSE and performance.

Implications

The factor of LSE for interpersonal skills, which was the one factor not included in the Hannah et al. (2008) study but was developed in this study, was the one factor that was able to best predict leadership performance over one and two years into the future. The fact that this LSE factor is not about the individual's performance but rather on how well he or she is able to support and cooperate with others is very telling. This indicates that leadership is more about leader and follower interactions than an individual's abilities or motivations, and the more selfless a leader is the more successful the team will be, at least for young leaders.

The new measure for LSE generated for this research is more useful than previously defined models because it is from work-related measures rather than purely from an academic environment, as is the case with the majority of previous studies. It has also been rigorously validated so can be more easily implemented in future studies. It may also be used by the practitioner for hiring or retention purposes, or more likely as a tool to focus training on areas that may have the greatest impact to the trainee.

It is interesting to note that efficacy measures have the ability to predict performance one and two years after the measures are taken. With all the changes a

person undergoes throughout their life, the implication that LSE may have trait-like qualities is very significant. Previously, specific self-efficacy measures were thought to be a state rather than a trait, but this study may change that perception.

Limitations

The time between the independent and dependent variable measures (between one and two years) may be a limitation when this research is compared to other similar studies. As most research into the area of efficacy has measures taken concurrently, the predictability between the dependent and independent variables may be different. Although the benefits of having a measure predict behaviors on a longer timeline are potentially greater than the costs, this research would have benefitted from a performance measure taken at same time as the efficacy measures. Also, this research was limited to U.S. Air Force officers in their first few years as leaders, which could affect the generalizability of the LSE model, as the expectations and thus the performance measures between junior and senior leaders can differ significantly.

Future Research

Since the data for this thesis was collected (1998) there have been updated GSE scales developed, which should be used in future research to further explore the relationship between GSE and LSE. Perhaps future research can also answer why GSE was significantly, negatively correlated to all four LSE measures.

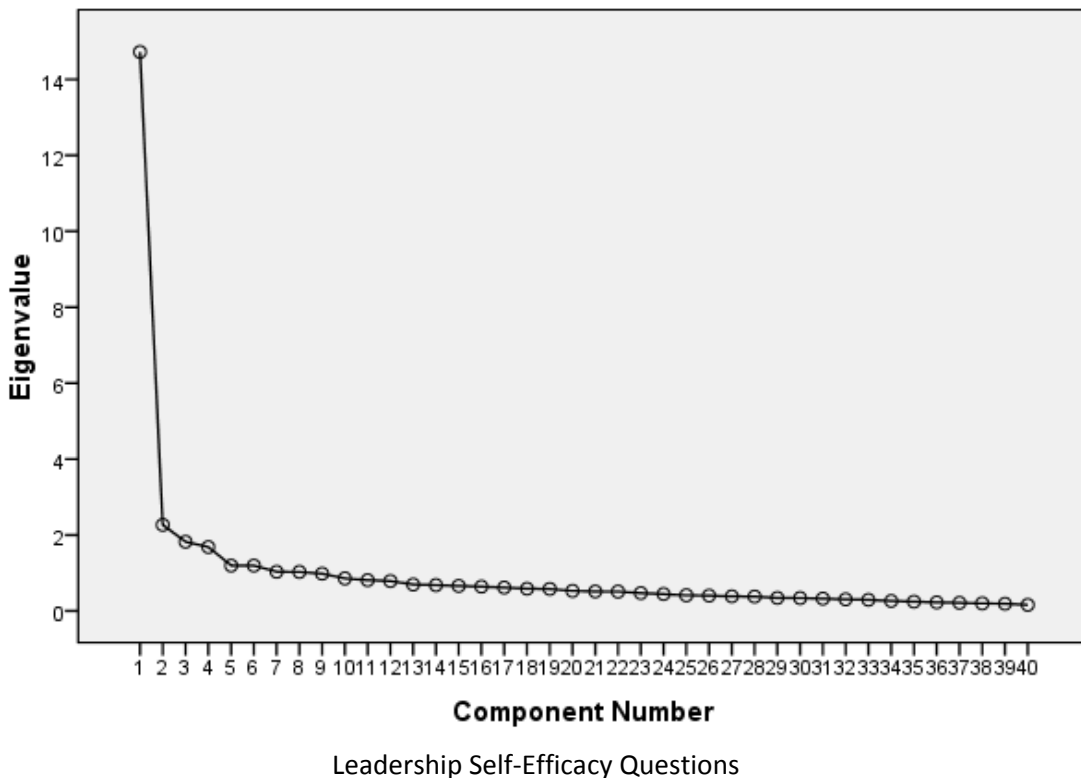
Additionally, whether GSE is a trait or a state was also not answered in this research, and as explained by Hannah et al., “greater understanding is needed regarding how leaders’ efficacy beliefs for specific tasks interact within their broader self-concept and with their general efficacy beliefs (2008: 675). The difference between long-term and short-term predictability of the LSE measures is one area that needs to be further

explored. Whether a relationship exists between the predictability of both GSE and SSE measures and the age of the individual could indicate whether and to what degree efficacy changes over the lifespan of a person. If GSE is indeed more of a trait than SSE, then it is expected that GSE would not change over time as much as SSE would, which is contrary to this study. The findings from this research do not fully answer this issue, but do open the door to explore the obvious relationship between the two measures.

Appendix A. Retained General Self-Efficacy Questions

1. One of my problems is that I cannot get down to work when I should
2. When I set important goals for myself, I rarely achieve them
3. I give up on things before completing them
4. I avoid facing difficulties
5. If something looks too complicated, I will not even bother to try it
6. When trying to learn something new, I soon give up if I am not initially successful
7. When unexpected problems occur, I don't handle them well
8. I avoid trying to learn new things when they look too difficult for me
9. I feel insecure about my ability to do things
10. I give up easily
11. I do not seem capable of dealing with most problems that come up in life

Appendix B. Scree plot of LSE data



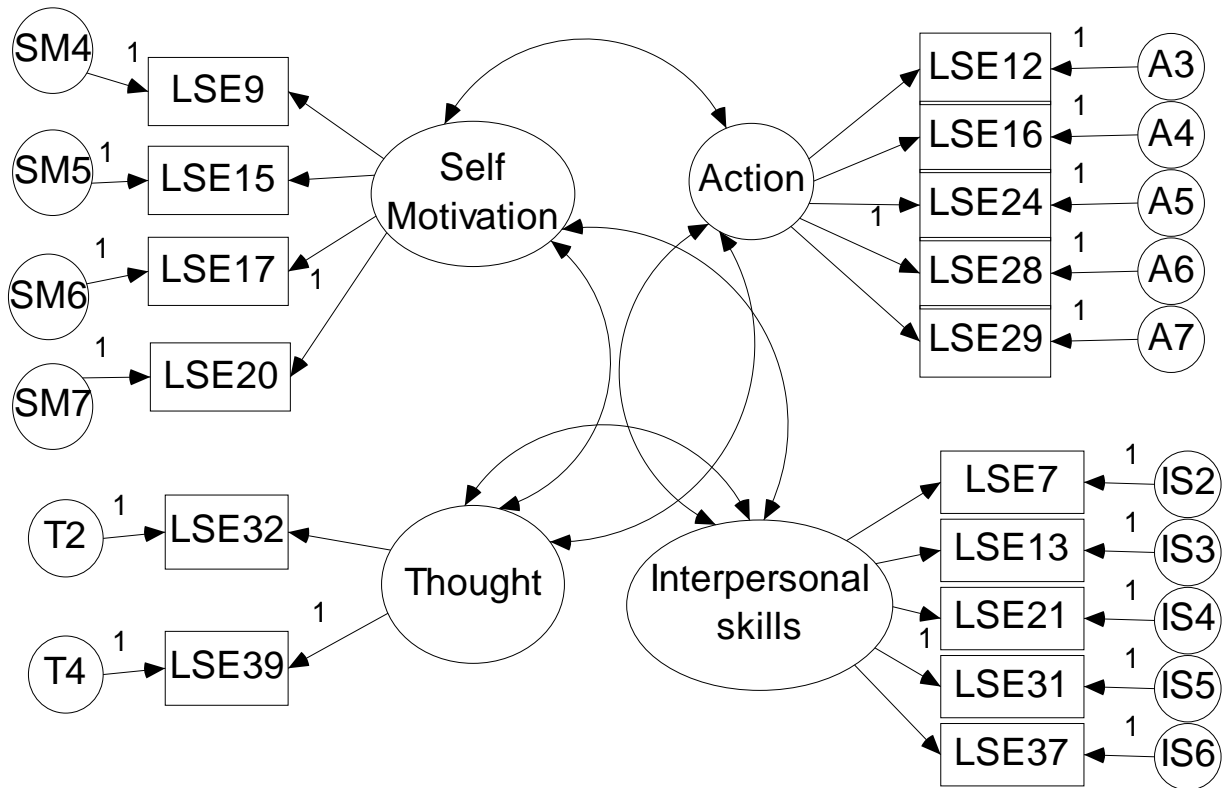
Appendix C, Rotated Component Matrix of LSE data

	Component			
	1	2	3	4
bsse1				.463
bsse2	.438	.573		
bsse3		.420		.558
bsse4		.623		
bsse5	.549			
bsse6		.516		
bsse7				.645
bsse8	.496			
bsse9		.578		
bsse10	.477			
bsse11	.646			
bsse12	.723			
bsse13				.668
bsse14			.647	
bsse15		.579		
bsse16	.583			
bsse17		.578		
bsse18	.509			.499
bsse19		.434	.408	
bsse20		.617		
bsse21				.557
bsse22		.460		
bsse24	.681			
bsse25			.487	
bsse27	.640	.476		
bsse28	.690			
bsse29	.639			
bsse30		.408	.408	
bsse31				.720
bsse32			.745	
bsse33			.558	
bsse34				
bsse35	.505			
bsse36				
bsse37			.405	.507
bsse38	.501	.446	.432	
bsse39			.689	
bsse40		.482		

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 33 iterations.

Appendix D, Confirmatory Factor Analysis Model of LSE data



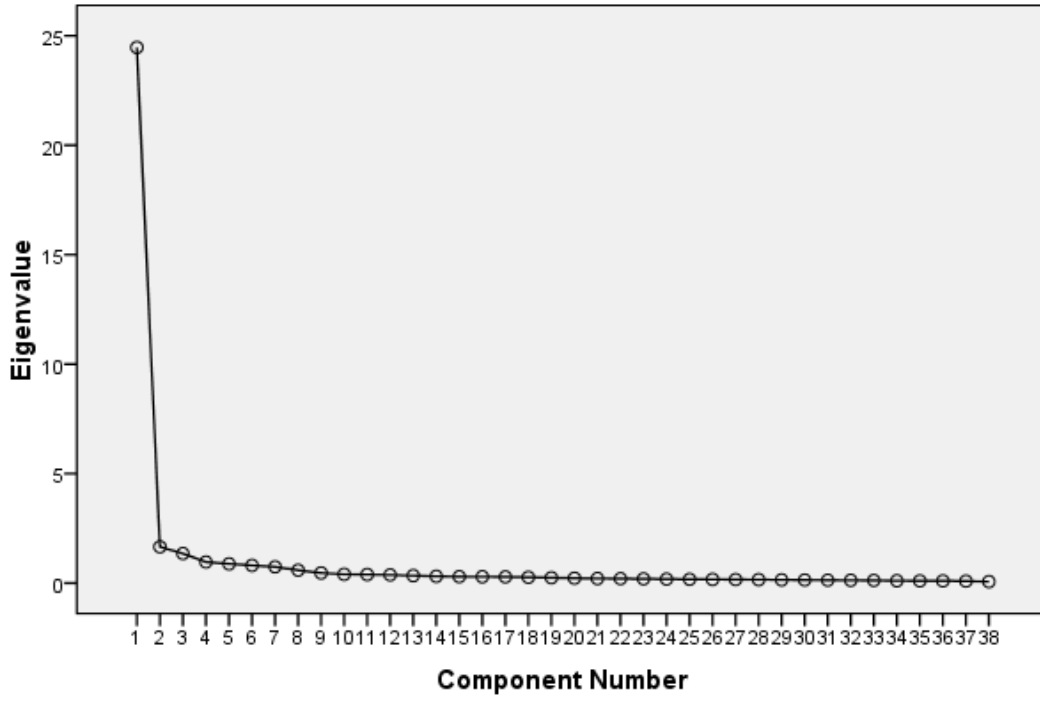
Appendix E, Retained LSE questions from factor analysis

The following are the 16 questions retained for the LSE model as well as the wording from the original questionnaire filled out by OTS students between the years of 1994 and 1997.

There are many ways a person can be effective in his or her job. The way they do their jobs is partly a matter of personal style, partly the result of their confidence about how effectively or ineffectively they perform various types of behaviors. Each item listed below describes an activity of behavior a person might perform in his or her job. Please read each behavior carefully and circle the number (0-10) that indicates *how effectively you could perform the behavior today if you were asked to.*

1. Get along with others
2. Ensure work is done right
3. Counsel others
4. Lend a hand when a coworker needs it
5. Get work done on time
6. Provide appropriate feedback to subordinates
7. Follow the supervisors instructions
8. Pay attention to details
9. Praise coworkers when they are successful
10. Resolve conflict between members of the unit
11. Coordinate subordinates' efforts to minimize conflicts
12. Assign duties appropriate for subordinate's abilities
13. Display concern for others
14. Use technical material appropriately
15. Consider other's needs before acting
16. Provide others with current technical information

Appendix F. Scree plot of performance data



Appendix G, Rotated Component Matrix of performance data

	Component		
	1	2	3
Follow instructions	.640	.534	
Managing time	.702		
cooperating		.782	
displaying self-decipline	.543	.639	
anticipating problems	.729		
delivering a briefing			.821
making sure work is done	.700		
performing technical tasks	.503		
maintaining apperance		.526	
initiating improvements	.647		
monitoring task performance			
taking responsibility	.502	.676	
maintaining good relations		.822	
prioritizing work	.717		
motivating people	.521	.613	
performing consistantly	.726	.496	
showing respect		.786	
overcoming obstacles	.717	.443	
supporting morale		.714	
writing a letter			.562
cnsdmg othrs nds		.737	
spkng before grp			.833
setting example	.475	.703	
helping someone		.712	
enforcng dress	.432	.534	
making decisions	.684	.485	
gttng thngs done	.772		
findng answrs	.775		
knwng what pri	.742	.412	
undrstndng what	.715	.452	
gvng frml brfng			.855
reslvg cnflcts	.513	.601	
taking charge	.637	.487	
supprtng EEOC		.671	
solving prblms	.752	.409	
writing reports	.450		.545
coordntng team	.556	.566	
crt prdct atmosp	.528	.673	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

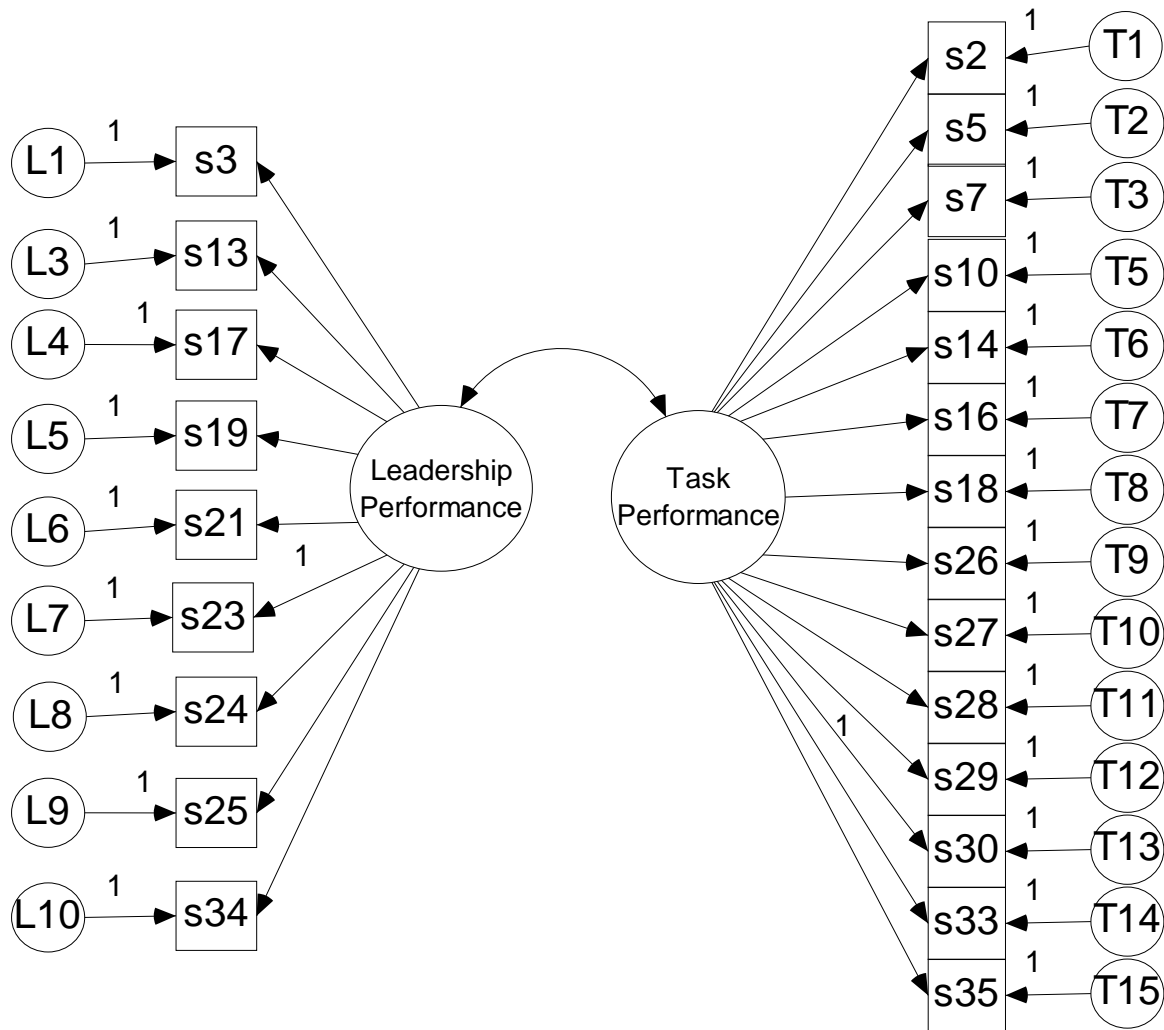
a. Rotation converged in 6 iterations.

Appendix H. Retained Supervisor Questions from factor analysis

Compared with other company grade officers, how effective is this officer in...

1. Managing Time
2. Cooperating with others
3. Anticipating potential problems
4. Making sure work is done right
5. Initiating improvements
6. Maintaining good working relationships
7. Prioritizing work
8. Performing consistently and reliably
9. Showing respect for others
10. Overcoming obstacles
11. Supporting unit morale
12. Considering other's needs
13. Setting the example for subordinates
14. Helping someone who needs it
15. Enforcing dress and appearance standards
16. Making decisions that require judgment
17. Getting things done
18. Finding answers to difficult questions
19. Knowing what the priorities are
20. Understanding what he/she is expected to do
21. Taking charge at appropriate times
22. Supporting human relations and EEOC programs
23. Solving problems

Appendix I. Confirmatory Factor Analysis Model of performance data



Bibliography

Anderson, David W., Krajewski, Henryk T., Goffin, Richard D., Jackson, Douglas N. "A leadership self-efficacy taxonomy and its relation to effective leadership." The Leadership Quarterly 19 (2008): 595-608.

Avolio, B. J. "Examining the full range model of leadership: Looking back to transform forward." (Eds.), D. Day & S. Zaccaro. Leadership development for transforming organizations. Mahwah, NJ: Erlbaum, 2002.

Bandura, Albert. Self-Efficacy, The Exercise of Control. New York: W.H. Freeman and Company, 1997.

Bandura, Albert. "Social Cognitive Theory: An agentic Perspective." Annual Review of Psychology (2001): 52: 1-26.

Bandura, Albert. Social Foundations of Thought and Action. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1986.

Beauchamp, Mark R., Welch, Amy S., Hulley, Angie J. "Transformational and Transactional Leadership and Exercise-related Self-efficacy; An Exploratory Study." Journal of Health Psychology (2007): 83-88.

Bray, D. W., Campbell, R. S., & Grant, D. L. Formative years in business. New York: Wiley, 1974.

Byrne, Barbara M. Structural Equation modeling with AMOS. New Jersey: Lawrence Erlbaum Associates, Inc., 2001.

Carver, W. R., & Scheier, M. F. On the self-regulation of behavior. New York: Cambridge University Press, 1998.

Cattell, R. B. "The scree test for the number of factors." Multivariate Behavior Research (1966): 245-276.

Chan, Kim-Yin, Drasgow, Fritz. "Toward a Theory of Individual Differences and Leadership: Understanding the Motivation to Lead." Journal of Applied Psychology (2001): 86, pgs 481-498.

Chemers, Martin M., Watson, Carl B., May, Stephen T. "Dispositional Affect and Leadership Effectiveness: A Comparison of Self-Esteem, Optimism, and Efficacy." Personality and Social Psychology Bulletin (2000): 267-277.

Chen, G., Gully, S. M., & Eden, D. "Validation of a new general self-efficacy scale." Organizational Research methods (2001): 4(1), 62-83.

Connelly, M., Gilbert, J., Zaccaro, S., Threlfall, K., Marks, M., Mumford, M. "Exploring the relationship of leadership skills and knowledge to leader performance." Leadership Quarterly (2000): 65-86.

Conway, J. M. "Managerial performance development constructs and personality correlations." Human Performance (2000): 13, 23-46.

Conway, J. M., Huffcutt, A. I. "A Review and Evaluation of Exploratory Factor Analysis Practices in Organizational Research." Organizational Research Methods (2003): 147-168.

Deemer, Sandra A. and Minke, Kathleen M. "An Investigation of the Factor Structure of the Teacher Efficacy Scale." The Journal of Educational Research (2001): 3-10.

Dixon, Gene. "Can We Lead and Follow?" Engineering Management Journal (2009): 34-40.

Dunnette, M. D. "Multiple assessment procedures in identifying and developing managerial talent." (Ed.), P. McReynolds. Advances in psychological assessment (vol. I). CA: Palo Alto, 1971. Science and Behavior Books.

Durham, C. C., Knight, D., Locke, E. A. "Effects of leader role, team-set goal difficulty, efficacy, and tactics on team effectiveness." organizational Behavior and Human Decision Processes (1997): 203-231.

Dvir, T., D. Eden, B.J. Avolio, B. Shamir. "Impact of Transformational Leadership on Follower Development and Performance: A Field Experiment." Academy of Management Journal (2002): 725-744.

Dvir, T., B. Shamir. "Follower Development Characteristics as Predicting Transformational Leadership: A Logitudinal Field Study." The Leadership Quarterly (2003): 327-344.

Eden, D. "From self-efficacy to means efficacy: Internal and external sources of general and specific efficacy." Paper presented at the 56th Annual Meeting of the Academy of Management, Cincinnati, OH. 1996.

Eden, D. "Means efficacy: External sources of general and specific subjective efficacy." M. Erez, U. Kleinbeck, & H Thierry (Eds.). Work motivation in the context of a globalizing economy. Hillsdale, NJ: Lawrence Erlbaum, 2001. pp. 65-77.

Eden, D. "Pygmalion, goal setting, and expectancy: Compatible ways to raise productivity." Academy of Management Review (1988): 13, 639-652.

Edwards, Paul, editor in chief. "Behaviorism." The Encyclopedia of Philosophy (1972): vol 7, pg 21.

Eriksen, O. E.,. "Leadership in a Communicative Perspective." Acta Sociologica (2001): 21-35.

Field, Andy. Discovering Statistics Using SPSS. Thousand Oaks, California: SAGE Publications, 2005.

Floyd, F. J., & Widaman, K. F. "Factor analysis in the development and refinement of clinical assessment instruments." Psychological Assessment (1995): 7, 286-299.

- Ford, Kevin J., MacCullum, Robert C., Tait, Marianne. "The Application of exploratory factor analysis in applied psychology: A critical review and analysis." Personnel Psychology (1986): 291-314.
- Fresco, D., Moore, M., van Dulmen, M., Segal, Z., Ma, S., Teasdale, J., Williams, J. "Initial Psychometric Properties of the Experiences Questionnaire: Validation of a Self-Report Measure of Decentering." Behavior Therapy (2007): 234-246.
- Friedman, L., Fleishman, E. A., & Fletcher, J. M. "Cognitive and interpersonal abilities related to the primary activities of R&D managers." Journal of Engineering and Technology Management (1992): 211-242.
- Gardner, D. G., & Pierce, J. L. "Self-esteem and self-efficacy within the organizational context." Group and Organization management (1998): 23, 48-70.
- Gayle, C. Avery, Jan Ryan. "Applying Situational Leadership in Australia." Journal of Management Development (2002): 242-262.
- Gist, M. E., & Mitchell, T. R. "Self-efficacy: A theoretical analysis of its determinants and malleability." Academy of Management Review (1992): 17, 183-211.
- Gordon, Angela & Yukl, Gary. "The Future of Leadership Research." German Journal of Human Resource Research (2004): 359-365.
- Hackman, J. R., Wageman, R. "When and how team leaders matter." B. M. Staw, R. M. Kramer, M. Roderick (Eds.). Research in organizational behavior: An annual series of analytical essays and critical reviews. Greenwich, CT: JAI Press, 2005. 37-74.
- Halpin, A. W., Winer, B. J. "A factorial study of the leader behavior descriptions." R. M. Stogdill, A. E. Coons (Eds.). Leader behavior: Its description and measurements. Columbus, OH: Ohio State University, Bureau of Business Research, 1957. 39-51.
- Hannah, S. T., & Luthans, F. "A cognitive effective processing explanation of positive leadership: Toward theoretical understanding of the role of psychological capital." (Ed.), R. H. Humphred. Affect and emotion: new directions in management theory and research. Information Age Publishing, 2008. volume 7 of research in management.
- Hannah, Sean T., Avolio, Bruce J., Luthans, Fred, Harms, P.D. "Leadership efficacy: Review and future directions." The Leadership Quarterly (2008): 669-692.
- Harrison, Allison W., Rainer, R. Kelley, Hochwarter, Wayne A., Thompson, Kenneth R. "Testing the Self-Efficacy-Performance Linkage of Social Cognitive Theory." The journal of Social Psychology (1997): 79-87.
- Hinkin, Timothy R. "A Brief Tutorial on the Development of Measures for Use in Survey Questionnaires." Organizational Research Methods (1998): 104-121.

- Howell, and B. Shamir. "The Role of Followers in the Charismatic Leadership Process: Relationships and Their Consequences." Academy of Management Review (2005): 96-112.
- Hoyle, R. H. "Confirmatory factor analysis." Brown, H.E.A. Tinsley & S.D. Handbook of applied multivariate statistics and mathematical modeling. San Diego, CA: Academic Press, 2000. pp. 465-497.
- Hoyt, C. L., Murphy, S. E., Halverson, S. K., & Watson, C. B. "Group leadership: Efficacy and effectiveness." Group Dynamics (2003): 7, 259-274.
- Judge, T. A., Erez, A., Bono, J. A. "The power of being positive: The relation between positive self-concept and job performance." Human Performance (1998): 11, 167-187.
- Kane, T.D., Zaccaro, S.J., Tremble, T.R., & Masuda, A.D.,. "An examination of the leader's regulation of groups." Small Group Research (2002): 33, 65-120.
- Kipnis, David & Lane, William P. "Self-Confidence and Leadership." Journal of Applied Psychology (1962): 291-295.
- leithwood, Kenneth, Jantzi, Doris. "Linking Leadership to Student Learning: The Contributions of Leader Efficacy." Educational Administration Quarterly (2008): 496-528.
- Locke, E.A. "The motivation sequence, the motivation hub, and the motivation core." Organizational Behavior and Human Decision Process (1991): 50: 288-299.
- Long, J. Scott. Confirmatory Factor Analysis, Series: Quantitative Applications in the Social Sciences. Newbury Park: SAGE Publications, 1983.
- Lord, R. G., Brown, D. J. Leadership processes and follower self-identity. New Jersey: Lawrence Erlbaum, 2004.
- Luthans, F., & Peterson, S.J. "Employee engagement and manager self-efficacy: Implications for managerial effectiveness and development." Journal of Management Development (2002): 376-387.
- Manz, C. C. "Self-leadership: Toward an expanded theory of self-influence processes in organizations." Academy of Management Review (1986): 11, 585-600.
- Marion, R., Uhl-Bien, M. "Leadership in complex organizations." Leadership Quarterly (2001): 389-418.
- Martocchio, J.J., & Judge, T.A. "Relationships between conscientiousness and learning in employee training: mediating influence of self-deception and self-efficacy." Journal of Applied Psychology, (1997): 82, 764-773.
- Maruyama, Geoffrey M. Basics of structural equation modeling. Thousand Oaks, California: SAGE Publications Inc., 1998.

McCall, Morgan W. "Leadership development through experience." Academy of Management Executive (2004): 127-142.

McCormick, Michael J. "Self-Efficacy and Leadership Effectiveness: Applying Social Cognitive Theory to leadership." The Journal of Leadership Studies (2001): Vol. 8, No. 1.

Miner, J. B. Role motivation theories. London: Routledge, 1993.

Multon, Karen D., Brown, Steven D., Lent, Robert W. "Relation of Self-Efficacy Beliefs to Academic Outcomes: A Meta-Analytic Investigation." Journal of Counseling Psychology (1991): 30-38.

Mumford, M. D., Friedrich, T. L., Caughron, J. J., & Byrne, C. L. "Leader cognition in real-world settings: How do leaders think about crisis?" The Leadership Quarterly (2007): 18, 515-543.

Mumford, M. D., O'Connor, J., Clifton, T. C., Connelly, M. S., & Zaccaro, S. J. "Background data constructs as predictors of leadership behavior." Human Performance (1991): 6, 151-195.

Murphy, S. E. "Leader self-regulation: The role of self-efficacy and multiple Intelligences." R. E. Giggio, S. E. Murphy & F. Pirozillo (Eds.). Multiple Intelligences and Leadership. Mahwah, NJ: Erlbaum, 2002. 163-186.

Netemeyer, Richard G., Bearden, William O., and Sharma, Subhash. Scaling procedures: issues and applications. Thousand Oaks, California: Sage Publications, 2003.

Ng, Kok-Yee, Ang, Soon, Chan, Kim-Yin. "Personality and Leader Effectiveness: A moderated Mediation Model of Leadership Self-Efficacy, Job Demands, and Job Autonomy." Journal of Applied Psychology (2008): 733-743.

Paglis, Laura L., Green, Stephen G. "Leadership self-efficacy and managers' motivation for leading change." Journal of Organizational Behavior (2002): 215-235.

Pajares, Frank. "Current Directions in Self-efficacy Research." Maehr, M. & Pintrich, P. R. (Eds.). Advances in motivation and achievement. Greenwich, CT: JAI Press, 2009. Volume 10, pp 1-49.

Parry, K. "The new leader: A synthesis of leadership research in Australia and new Zealand." Journal of Leadership Studies (1998): 5, 82-105.

Prussia, G. E., Anderson, J. S., & Manz, D. C. "Self-leadership and performance outcomes: The mediating influence of self-efficacy." Journal of Organizational Behavior (1998): 19, 523-538.

Robertson, I.T., & Sadri, G. "Managerial self-efficacy and managerial performance." British Journal of management (1993): 4, 37-45.

Saks, A.M.,. "Longitudinal field investigation of the moderating and mediating effects of self-efficacy on the relationship between training and newcomer adjustment." Journal of Applied Psychology (1995): 80, 211-225.

- Sansone, Carol, Morf, Carolyn, and Panter, A. The Sage handbook of methods in social psychology, editors. Thousand Oaks, California: Sage Publications, 2004.
- Shelton, S. H. "Developing the construct of general self-efficacy." Psychological Reports (1990): 987-994.
- Sherer, M., Maddux, J. E., Mercandante, B., Rentice-Dunn, S., Jacobs, B., Rogers, R. W. "The Self-Efficacy Scale: Construction and Validation." Psychological Report (1982): 51, 663-671.
- Shrauger, Sidney J., Schohn, Marry. "Self-Confidence in College Students: Conceptualization, Measurement, and Behavior Implications." Assessment (1995): 255-278.
- Smit, Bosscher and. (1998).
- Stajkovic, Alexander D., Luthans, Fred. "Self-Efficacy and Work-Related Performance: A Meta-Analysis." Psychological Bulletin (1998): 240-261.
- Stevens, J. P. Applied multivariate statistics for the social sciences (2nd edition). Hillsdale, NJ: Erlbaum, 1992.
- Tabachnick, B. G., & Fidell, L. S. Using multivariate statistics. Boston: Allyn & Bacon, 2001.
- Tabernerero, C., Chambel M., Curral, L. Arana, J. "The role of task-oriented versus relationship-oriented leadership on normative contract and group performance." Social Behavior and Personality (2009): 1391-1404.
- Vecchio, Robert P., Bullis, R. C., Brazil, Donna M. "The Utility of Situational Leadership Theory." Small Group Research (2006): 407-424.
- Weems, Gail H. and Onwuegbuzie, Anthony J. "The Impact of Midpoint Responses and Reverse Coding on Survey Data." Measurement and Evaluation in Counseling and Development (2001): 166-176.
- Wood, Dustin. "Using the PRISM to Compare the Explanatory Value of General and Role-Contextualized Trait Ratings." Journal of Personality (2007): 1103-1126.
- Wood, R.E., & Bandura, A. "Impact of conceptions of ability on self-regulatory mechanisms and complex decision making." Journal of Personality and Social Psychology (1989): 407-415.
- Yukl, G. Leadership in organizations, 5th ed. Upper Saddle Creek, NJ: Prentice-Hall, 2002.
- Yukl, G. "Managerial leadership: A review of theory and research." Journal of Management (1989): 15, 251-289.

SF 298

REPORT DOCUMENTATION PAGE			<i>Form Approved</i> <i>OMB No. 074-0188</i>	
<p>The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p> <p>PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.</p>				
1. REPORT DATE (DD-MM-YYYY) 03-03-2010		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From - To) July 2009-March 2010
4. TITLE AND SUBTITLE The Development of a Leadership Self-Efficacy Measure			5a. CONTRACT NUMBER	
			5b. GRANT NUMBER	
			5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Platt, Seth D., Capt, USAF			5d. PROJECT NUMBER	
			5e. TASK NUMBER	
			5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S) Air Force Institute of Technology Graduate School of Engineering and Management (AFIT/EN) 2950 Hobson Way WPAFB OH 45433-7765			8. PERFORMING ORGANIZATION REPORT NUMBER AFIT-GEM-ENV-10-M07	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Intentionally Left Blank			10. SPONSOR/MONITOR'S ACRONYM(S)	
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT				
13. SUPPLEMENTARY NOTES This material is declared a work of the U.S. Government and is not subject to copyright protection in the United States				
14. ABSTRACT <p>The construct of self-efficacy has been used extensively to analyze and predict what motivates human behavior, to include leadership behaviors. The connection between self-efficacy and leader effectiveness may be critical to finding new ways of selecting and developing leadership in organizations.</p> <p>The efficacy of individuals at the general and specific levels was studied with data collected from officer training school graduates and their post-training supervisors. With this data a new leadership self-efficacy (LSE) framework was created and validated, and this framework was used to compare the predictability of the previously validated general self-efficacy (GSE) measure to distal performance measures.</p> <p>GSE was found to be a poor predictor of future behaviors while an individual's self-efficacy for interpersonal skills was found to be a significant contributing factor to future leadership behaviors.</p>				
15. SUBJECT TERMS Leadership Self-Efficacy, General Self-Efficacy, Leadership, Task Performance				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 59
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U		
			19a. NAME OF RESPONSIBLE PERSON Alexander J. Barelka, AFIT/ENV	
			19b. TELEPHONE NUMBER (Include area code) (937) 255-3636 (Ext 7404)	
			Standard Form 298 (Rev. 8-98) <small>Prescribed by ANSI Std. Z39-18</small>	
			<i>Form Approved</i> <i>OMB No. 074-0188</i>	