THE EFFECT OF ORGANIZATIONAL SUPPORT FOR LEADERSHIP DEVELOPMENT ON LEADER SKILLS, COMPETENCIES, AND BEHAVIORS AS WELL AS ORGANIZATION PERFORMANCE IN FEDERAL AGENCIES: IS THERE A RETURN ON INVESTMENT?

by

MICHAEL E. KOEHLER

(Under the Direction of Hal G. Rainey)

ABSTRACT

The development of leadership skills and competencies in the federal government has lacked the minimal and consistent support necessary to produce consistent positive outcomes across agencies in leader skills, competencies, and behaviors, as well as workplace performance. Although observers of government have identified this problem as a one of great importance for many years, in part due to the imminent retirement of a substantial number of employees currently in leadership positions, little has been done to improve the situation. Despite the importance of this issue and its relevance to government performance, few researchers of public management have pursued study of the issue.

This study employs prior research and theory to develop a theoretical model of the effect of organizational support for leadership development on organization-wide leader skills, competencies, and behaviors, as well as organization performance. Using this model as a foundation, this study proposes nine hypotheses of the effects of organization support for leadership development on various leader skills, competencies, and behaviors, as well as aspects

of organization performance. These hypotheses are tested utilizing the responses to a large-n survey of federal personnel aggregated to the organizational sub-element level. The results of the data analysis employing OLS regression estimation provide strong evidence that organizational support for leadership development has positive effects on measures of the goal-setting organizational environment, the organization-wide interpersonal communication environment, the organization-wide implementation of performance evaluation, the organization-wide adherence by leaders to meritocratic principles, the organization-wide utilization of personnel talent, and the work quality organization-wide.

Taking these results into consideration and employing a modified return on investment framework, this study make a case that this data can be used to make a rudimentary estimate of the return produced in each outcome measure as a result of increasing organizational support for leadership development. These estimates, combined with the statistically significant and positive relationships discovered in this study, serve as evidence that federal government organizations can produce beneficial effects in leader behavior and action, as well as organization performance, by increasing their level of support for leadership development.

INDEX WORDS: Leadership, Leadership Development, Public Management, Federal Government, Performance, Organizations

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DEDICATION

To my wife Sharon, without whose loving support and patience this endeavor and its success would not have been possible. Thank you for all of the sacrifices you made to aid my pursuit of this doctorate. This degree is as much yours as it is mine.

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CHAPTER 1

INTRODUCTION

Much greater attention and resources should be devoted to strategic management of human resources with particular emphasis on in-service training and executive development.

Federal training policies should reflect an appropriate balance between short- and long-term needs of government agencies and personnel by developing programs that do not merely concentrate on immediate skill and information requirements, but also provide opportunities to develop the broader knowledge and basic management skills required for positions of greater executive responsibility.

- Recommendation 9, Task Force on Education and Training Report to the National Commission on the Public Service, 1989.

The preceding passage is excerpted from the recommendations made to the National Commission on the Public Service by a group of experts charged with identifying necessary and productive improvements to the development and training of federal employees (National Commission on the Public Service 1989b). This body is also referred to as the "Volcker Commission" after its chairman, former Chairman of the Federal Reserve Paul Volcker. The Commission, convened in 1987, sought to investigate solutions for what it called a "quiet crisis," the decline in attractiveness of public sector employment and its effect on the "quality and performance at the senior administrative and professional levels of the federal government" (National Commission on the Public Service 1989a).

The recommendations addressing how the federal government might go about improving the leadership development process included in the Commission's final report did not mirror the stronger language of the Task Force's recommendation, quoted above. Rather than call for to the

establishment of minimum leadership development standards across federal agencies, the Commission advised that the Office of Personnel Management (OPM) should "encourage" agencies to offer leader development and provide "help" and "guidance" with the design of agency-based leadership development programs (National Commission on the Public Service 1989a). Despite the relatively weak language of its recommendation as compared to the Task Force's language emphasizing the establishment of "policies," the Commission did recognize at the time the importance of leadership development in the public service, a point reiterated by the second National Commission on the Public Service in 2003 (National Commission on the Public Service 2003).

What is important to note about the recommendation above is that it was made over 20 years ago at the time of this writing. The call to action by the Commission was not a lone voice; many others before it and after it have sought to bring notice to the same and similar problems. In addition, the Commission was made up of highly respected and influential members of society from the public, private, and higher education sectors, the counsel of whom should carry enough weight of influence to expect action. Their recommendations were submitted to the President and Congress as guidelines for legislation and policy development. Yet in the intervening years since this report, though some progress has been made, many of the problems that report called attention to, remain.

This study seeks to investigate an aspect of the persistent issue of leadership development in the federal government and attempts to isolate effects of organizational support for this type of employee education. To do so, this study presents evidence of a continued state of overall neglect of leadership development in the federal government, identifies potential reasons that this neglect of leadership development has persisted, makes an argument for the beneficial

organizational effects of leadership development, and utilizes data from a large government survey to provide evidence that investment in the development of leaders can have positive effects on leader skills, competencies, and behaviors as well as, consequently, the environment and performance of an organization.

Clarifying the Term "Leadership Development"

Before proceeding, it is necessary to clarify what the term leadership development represents in terms of its substance for the purposes of this study. Although the terms "leadership" and "management" are often used interchangeably to refer to the development activities undertaken by organizations in the pursuit of fostering positive management behaviors and outcomes, scholars struggled to accept such a mingling of terminology. The main point of contention focuses on what qualities distinguish the concept of leadership from the concept of management and are those differences significant enough to warrant a distinct separation of the two concepts or are they irrevocably intertwined (Yukl 2006). The evidence provided by Yukl points toward a relationship that is complex and one in which the exclusion of one concept limits the understanding of the processes of the other.

Day (2001) provides a more detailed assessment of the importance of distinguishing management development from leadership development. He points out that there are critical differences in the content and the focus of programs to develop management skills versus programs to develop leadership skills. Using information gleaned from a survey of research literature, he characterizes management development as having two main points of emphasis – education and training in the "knowledge, skills, and abilities to enhance task performance in management roles" and the "application of proven solutions to known problems," i.e. a heuristic, experience-based approach to development. In contrast, according to Day, leadership

development seeks to equip members of an organization with the ability to successfully employ leadership "roles and processes."

The distinguishing factor is the formalization of the role. Leadership roles may originate in the formal authority bestowed by organizational position or processes or may spring from the qualities of the individual, exclusive of the individual's formal authority. Thus, an individual may become a leader due to the nature of their position in the organization structure or as a result of the quality of their personality and actions, which inspire others to follow their lead. Management roles are formally established by organization structure, they are not generated or validated by the qualities or independent actions of the individual outside of a formal role (one does not assume the role of a manager by acting like one, he or she must be assigned to such a position and given formal authority). In addition, the leadership role carries with it the expectation of adaptability and the potential for the alteration of formal organizational structures if circumstances demand it. The managerial role is constrained by and expected to function within the defined expectations of the position, focusing on process, with a limited emphasis on innovation.

Despite this conceptual distinction drawn in academic literature, most organizations operate a "leadership development program" which combines both management-oriented and leadership-oriented education opportunities. The basic premise of these programs is to teach the various skills, competencies, and behaviors that are deemed to be characteristic of effective leaders to employees who are currently in positions of organizational leadership or may attain such positions in the future. These programs can consist of a range of activities. Yukl (2006) provides a comprehensive survey. These activities include formal training, which tends to focus more on the development of management competencies, as described by Day above. They may

also include less formal developmental activities based on structured experiences, such as rotating work assignments, special assignments, receiving mentoring and coaching, action learning, developmental assessment, multisource feedback, outdoor challenges, and personal growth programs.

As one can see, the typical leadership development program provided by an organization follows the view of Yukl that leadership and management are intertwined. The content is often a hybrid of management skills and competencies development, focusing on the formal role and responsibilities of a position of authority, and leadership skills and competencies, seeking to develop the "soft skills" that make a person in a position of authority more effective on an interpersonal level. The leadership development opportunities readily available to the subjects of this study mirror this hybrid structure. Therefore, when this study refers to leadership development, the content implied is that of both management competency development and leadership competency development, as described above.

Private Sector Investment Shows Understanding of Benefit of Leadership Development

Having clarified the term "leadership development" for the purposes of this study, attention now turns to the value of leadership development to an organization. Research evidence shows that the competency of personnel in leadership roles has an impact on the performance of that organization (Rainey 2003; Van Velsor et al. 2010; Whetten and Cameron 2007). This impact ranges from the discrete individual level, e.g. influencing the performance of individual employees, to the aggregate organizational level, where management actions combine to affect the overall performance of the organization. Belief in the influence of organization leadership on performance is evident in the private sector, where many of the highest performing companies make substantial investments in the development of their leadership cadre (Fulmer and Gibbs

1998; Fulmer and Goldsmith 2001; Meister 1998). Such a high level of investment would suggest that many of the most successful private sector companies recognize value in the support of leadership development, as it produces substantial organizational benefits for them. If this were not the case, private organizations operating in a competitive environment with other firms would likely not waste valuable resources on the improvement of leader skills and competencies, given a known lack of benefit.

Many private sector organizations attempt to quantify the benefits of leadership development by calculating a return on investment from the program. Simple return on investment calculations involve aggregating the program costs and quantifying the program benefits in money terms. Return on investment is the proportion of benefits to costs (Phillips 2003). The organization assesses this ratio and makes a qualitative judgment as to whether the return on investment is high enough to justify continued support of the program or program component. Return on investment provides a framework in which to assess the value of leadership development to the organization and therefore is a concept that this study will return to in later passages.

Research on the Public Sector Shows Leader Actions Affect Organizational Performance

Given the evidence above that many private organizations realize benefits from high levels of investment in and support of leader development, it is not unreasonable to expect similar results in public organizations. While there are a few differences between the public and private sectors (Rainey 2003; Rainey and Bozeman 2000), public sector leaders employ many of the same skills, competencies, and behaviors to manage and enhance performance that are productive in the private sector (Rainey 2003; Van Wart 2005; Whetten and Cameron 2007; Yukl 2006). Therefore, it follows that if government organizations invest a greater level of

resources and organizational support into developing leaders, they should be able to realize organizational performance gains, as do the high performing private sector companies described here. A key question in this relationship is: do the differences between public and private sector organizations preclude public sector leaders from influencing organizational performance?

Scholars have developed a strong body of research and theory supporting the assertion that, in the words of Kettl, "public management matters, and it matters because the quality of public management shapes the performance of public programs" (Kettl and Milward 1996). This research includes evidence of the impact of federal supervisors (Brewer 2005), state government managers (Moynihan and Pandey 2005), and local law enforcement managers (Nicholson-Crotty and O'Toole 2004) on organizational performance. In addition, O'Toole and Meier (Meier and O'Toole 2009; O'Toole and Meier 1999) have developed and tested a theoretical model of the impact of public management on performance. Results from these studies include evidence that both the development of human capital (O'Toole and Meier 2009) and the quality of management in Texas public schools (Meier and O'Toole 2002) is significantly related to positive improvements in nine out of ten performance measures. Other theoretical models exist, such as the one developed by Lynn, Heinrich, and Hill (2000) which proposes that individual level and/or organizational outputs/outcomes are a function of a combination of factors, including a conglomeration of managerial roles and actions. Another constructed by Rainey and Steinbauer (1999) points out the importance of leadership effectiveness as it relates to organizational effectiveness.

In addition to this empirical and theoretical work, there exists a body of qualitative research, including a number of case- and character-studies, which lend further credence to existence of the relationship (Behn 1994; Doig and Hargrove 1990; Hargrove and Glidewell

1990; Ingraham, Joyce, and Donahue 2003; Lewis 1980; Riccucci 2005; Riccucci 1995). The scholarly work described here and theory supports the point made by Lynn, Heinrich, and Hill (2000, 8) that, "there is virtually always a need for management with respect to public-sector activity, and, therefore, managerial behavior is almost always a factor in government performance." The research described above provides a powerful argument that leadership does have an effect on organizational performance in the public sector.

Neglect of Leadership Development in the Federal Government

The importance of leadership as an influence on government performance has not been lost on observers within the federal government sphere, such as the Government Accountability Office (February 2004; June 2005) and the two National Commissions on the Public Service (National Commission on the Public Service 2003; National Commission on the Public Service 1989a). Yet the results of numerous recent surveys of federal employees (Partnership for Public Service and Grant Thornton, LLP 2008; United States Merit Systems Protection Board 2009b; United States Merit Systems Protection Board 2007; United States Office of Personnel Management 2007; United States Office of Personnel Management 2009b) show that too many persons in positions of authority do not possess the basic leadership competencies necessary to be effective.

Such survey results are not surprising when one takes into account the overall lack of coordinated structure and resources dedicated to development in the federal government. Federal law and regulations essentially leave the quality of human capital development programs up to the determination of the individual agencies, without rules for minimum resources allocated, basic development standards, or performance outcomes. Likely consequences of this generally unstructured approach is that a substantial number of federal government organizations under-

fund human capital development (American Society for Training and Development 2007; American Society for Training and Development 2004; National Commission on the Public Service 1989a; United States Office of Personnel Management 2001; Voinovich 2000) compared to levels that would produce notable organizational benefits and also find it easy to neglect support of human capital development as a consequence of its lack of institutionalization.

Another effect of the deficiency of baseline levels of resources for, structure of, and performance expectations for development is a notable variation of program quality between federal agencies (National Academy of Public Administration 2003; Partnership for Public Service 2008b; United States Office of Personnel Management 2001). This overall lack of requirements for structure and resources to support human capital development and the consequential inconsistency of program quality between agencies, including the development of both potential and current leaders, forms the basis of comparison for this study.

The Federal Government's Leadership Problem

The early identification of candidates for leadership positions and the adequate development of those leaders is a significant and growing problem for the federal government. Many observers have called attention to the problem of looming mass retirements and the implications that those retirements will have on the capacity of the managerial ranks to lead, but little has been done comprehensively to address this problem. Federal agencies overall have fallen short of creating the necessary programs and structures to adequately identify, develop, and promote candidates for positions of leadership.

The urgency of this problem is reflected in information from a number of sources. The Office of Personnel Management estimates that between 2010 and 2016 the number of full-time federal employees employed during the year of analysis (2006) who will be eligible to retire will

grow from 566,801 to 956,813 (United States Office of Personnel Management 2008). During that same time period, the OPM predicts that, of those eligible employees, the number that will actually retire will grow from 246,209 to 586,339. Although this data did not distinguish supervisory positions from non-supervisory positions, the Merit Systems Protection Board predicts that supervisors will make up a higher percentage of these retirements based on an analysis of the Central Personnel Data File showing that supervisors tend to be older with more years of service than non-supervisors (United States Merit Systems Protection Board 2009a). Additionally, the Partnership for Public Service details projections from the Office of Personnel Management, which indicate that by 2012, 36 percent of the Senior Executive Service will retire and 76 percent will be eligible to retire (Partnership for Public Service 2008a).

While such projections indicating an impending wave of mass retirement are not new and large-scale departures have yet to occur, the figures indicate that over the coming years a large number of leadership positions will be vacated, either due to voluntary or forced retirement as the leadership cadre continues to age. With hiring policies in place that make the recruitment of persons outside of government to fill career leadership positions cumbersome, these positions must be filled in a large part by candidates promoted from within the government. Many of these will not have the necessary development to function successfully as a leader if the current overall neglect of leadership development in the federal government continues.

A Possible Reason for Neglect of Leadership Development

The preceding paragraphs have established evidence that organization leadership has a notable influence over organization performance. Despite this, and notwithstanding persistent evidence of a burgeoning problem and warnings over a number of years indicating that a retirement wave in the leadership ranks of the federal government could result in a rapid and

substantial loss of leadership capacity, little has been done to address the issue that leader development in the federal government has been under funded and under supported overall. Evidence indicates that the federal government has not made a concerted, strategic effort to address this problem through such avenues as establishing minimum required standards for leader development and baseline levels of dedicated funding, despite ample time to plan and prepare.

A number of possible reasons for this neglect could be put forth, but one that can be considered a leading candidate is that public sector expenditures related to professional development of employees can be difficult to justify without the ability to isolate and identify the benefit derived from the investment. The fact that most federal government agency budget requests have not explicitly included training and development expenditures and that these expenses instead come from the organizations' general operating funds is a likely result of this shortcoming (Voinovich 2000). This situation has two negative consequences for leader development and its evaluation. First, it is difficult to independently assess the level of yearly spending dedicated to leader development in each agency, as this information is not publicly reported. Second, it is likely that money for training and development, because it is not budgeted specifically for that purpose and come from a general pool of operating funds, is a prime candidate to be one of the first expenses cut during difficult budget periods.

Given the situation described above, it would be advantageous for leader development if the activity could be explicitly justified and budgeted for. In doing so, the organization would establish funding dedicated to leadership training. This would establish a year-by-year consistency to funding levels, avoiding the yearly fluctuations that are a near certainty due to the nature and purpose of the present source of training funds, the general operating fund. If a way

to measure the benefits of leader development in relation to the investment in development can be developed, similar to that of return on investment, then organizations could be provided with a tool to defend dedicated funding.

There are some problems with measuring both the costs and the benefits of leadership development, however, particularly in the public sector. As described before, leadership development expenditure data is not readily available. Therefore other measures of organizational support for leadership development must be used. Leadership development involves the improvement of soft skills and management skills, such as communication, managing and motivating personnel, and interpersonal skills. As this study will establish, these skills have value for the organization and influence performance. However, that value is intangible and difficult to measure, particularly in fiscal terms (Phillips and Phillips 2007). In most private sector instances, a typical return on investment calculation investigating the impact of investment in leader development might use a quantifiable output from the unit under the leader's authority, such as increase in revenue or some type of production metric. Such an output measurement is frequently not viable in the public sector, as a many activities do not produce easily quantifiable or comparable outputs. Alternative measures of benefit must be developed.

As the preceding paragraphs show, determining the return on investment for leadership development in the public sector is very difficult under the conventional method. Data detailing the cost of development is not readily available. The benefits of soft skill development are not easily quantified, nor is the output activity of a government organization. In order to attempt to evaluate the benefit of leadership development for a public sector organization, the investigator must find viable substitute measures for investment in development and for the benefits of development. In this sense, the investigator is constructing an alternative means of measuring

return on investment for leadership development for the public sector context. This study will attempt to justify and utilize a number of such substitute measures to investigate the relationship between investment in and benefits of leadership development in the federal government. As part of this process, this study will also attempt to rationalize just such an alternative means of measuring return on investment, which could allow organizations to justify greater support and resources for leadership development.

Public Sector Leadership Development Also Neglected in Research

The study of leadership development and its impact on leadership capacity and effectiveness has received little systematic attention in the public sector context. A large body of literature exists that investigates the relationship between the actions of public managers and organizational performance, as detailed above. Yet, this body does not explore the impact of the development of those leaders on their ability to influence performance. Other studies of leadership in the public sector do not focus on the cadre of leaders as a whole, but rather on unique individuals who stood out in their efforts to lead an organization (Behn 1994; Doig and Hargrove 1990; Ingraham, Joyce, and Donahue 2003; Riccucci 1995; Riccucci 2005). These individual case studies tend to focus on the traits of particular leaders. While the studies may detail some of the key developmental experiences that led to this individual becoming a notable leader, they do not provide a generalizable understanding of the influence that structured organizational leadership development can have on leader effectiveness.

The body of research focusing on leadership development in the public sector that does exist is, for the most part, normative in nature. Apart from government studies which mostly rely on reporting the results of opinion surveys and interviews in which responders relate their perception of adequacy of leadership development opportunities and preparedness to meet

requirements of leadership positions, most of the rest of the literature relies on case studies and idealized arguments to make a case for the value of leadership development. For examples of empirical work, one has to look almost exclusively to the private sector, as only a few examples focus on the public sector. In this body of work focusing on the private sector, most studies investigate the impact of discrete leadership development interventions, rather than organizational impacts of organization-wide leadership development efforts. This study seeks to address both gaps in the literature, public sector orientation using empirical methods and organization-wide focus.

Purpose of this Study

The purpose of this study is to attempt to fill a number of gaps in leadership development research. First, it addresses the general neglect of leadership development research in the public sector context. As described above, public sector leadership influences organization performance. Therefore the development of leadership should be studied as a potentially important antecedent factor in the magnitude of impact public sector leaders have on performance.

Second, it investigates the relationship between measures of organizational investment in leadership development and beneficial outcomes in leadership behavior and organization environment in the public sector. The public sector does not often have readily available data on spending for leadership development, nor does it have easily quantifiable or monetizable outputs with which to measure the impact of that development. This study makes use of substitute measures for investment and benefit to investigate the relationship between leadership development and leader behaviors beneficial to the organization.

Finally, this study attempts to develop empirical evidence in support of investment in leadership development in the public sector. Up to this point, most arguments in favor of increased leadership development investment in the public sector were normative, backed up only by survey results. These arguments could not provide evidence of a relationship between leadership development and benefits to the organization.

Ideally, this research could serve as a basis for further avenues of investigation for scholars interested in leadership, human capital development, public management, and public sector performance. Practically, this research could provide the basis for the development of a framework for federal agencies to collect evidence in support of budgetary justification for dedicated funding for leadership development. In the end, all of these goals center on a single research question: do federal government organizations realize a benefit when they have an organization-wide effort in place to support leadership development?

Organization of this Study

This study is organized in the following way. Chapter 2 reviews the relevant research literature pertaining to training and development in general and, more specifically, leadership development, including the public sector context. Chapter 3 employs research and theory from a number of sources and fields to develop a theoretical model of effect transfer from support of leadership development to organizational outcomes. Chapter 4 explains nine testable hypotheses based on the theoretical model laid out in chapter 3. Chapter 5 provides a description of the data and methods used to test these hypotheses. Chapter 6 presents the process of the analysis of the data and the results produced. Chapter 7 discusses the results of the data analysis and provides assessments of support or rejection for each hypothesis. Finally, chapter 8 summarizes the study; addresses potential methodological issues; and proposes ideas for future research into the topic.

CHAPTER 2

LITERATURE REVIEW

The literature focusing on the value of leadership development for leader effectiveness and organizational gain is relatively robust for the private sector and nearly non-existent for the public sector. Much of the work in the private sector originates in the human resource development field of academic study. This body of work generally provides empirical research to support the idea that leadership development has beneficial effects for both the individual and the organization. The typical focus of study in this sector is a specific type of development intervention and its effect.

The largest portion of public sector literature is government studies and reports, employing little if any empirical methods investigation, providing as results normative arguments and prescriptions for enhanced attention to leadership development. The small body of scholarly work published in research journals and books is based on case studies or surveys. The few examples of empirical research focus on state and local governments and are limited to the study of single programs, focus on a narrow scope of outcome measures, or utilize study populations that are not viably comparable. A survey of the literature provides evidence of the value of leadership development but also brings to light the dearth of empirical research investigating its benefits to public sector organizations.

This study seeks to develop a line of reasoning to support the value of leadership development for organizations in the public sector. In order to do this, and given the lack of empirical investigation of leadership development effects in the public sector, the foundation of

this study is built from a general perspective on training and development impact to the more specific perspective of leadership development impact, with most literature focusing on the private sector. This review of training and development literature will cover four areas: the effects of general training and development on participants and organizations, the more specific study of leadership development, and the particular focus on leadership development in the public sector, and finally, the environment and context of leadership development in the federal government.

General Training and Development

The literature that evaluates the value and effectiveness of training and development in the private sector is a rapidly developing topic of inquiry within psychology, business, and human resource fields of research. This is no surprise given the fact that the American Society for Training and Development reported, "that U.S. organizations spent $134.07 billion on employee learning and development in 2008" (American Society for Training and Development 2009). It appears private sector organizations find employee training and development to be an area of human resources to which attention must be paid and resources must be devoted. It would also seem that given the money spent on training and development, these companies must recognize enough return on investment to justify such a high level of expenditure. The expectation that training and development produces a return on investment is also finding evidentiary support in the research literature.

The *Annual Review of Psychology* has conducted periodic reviews of training and development research literature since 1971. For the most part in these early reviews, training was taken as something that was generally understood to be beneficial to employees and organizations, but little evidence was provided to prove such assertions. Reviews of the literature

just prior to the most recent (Salas and Cannon-Bowers 2001; Tannenbaum and Yukl 1992) found that research in this area of study was still in its nascence (Tannenbaum and Yukl) and beginning to accelerate and mature (Salas and Cannon-Bowers), providing limited insight into the tangible usefulness of training and development for individuals and organizations.

According to the most recent review of this literature in the *Annual Review of Psychology*, the study of training and development has broken out of its original home in the field of psychology and found root in other disciplines such as "human resource management, instructional design, human resource development, human factors, and knowledge management" (Aguinis and Kraiger 2009). Results from these studies show that training and development has a positive impact on the performance of individuals, teams, organizations, and societies.

A meta-analysis of 165 training and development outcome studies conducted by Arthur et al. (2003) finds that organizational training and development had medium to large positive effects across the four evaluation criteria of training and development proposed by Kirkpatrick (2007). These criteria are the reaction of participants to the program; the knowledge acquired, skills improved, and the attitudes changed by the program; the changes in job-related behavior and performance as a result of the program; and the changes in performance as a result of the program. The analysis found that the most effective programs were those focusing on both cognitive and interpersonal skills.

Tharenou et al. (2007) presents another meta-analysis of 67 studies focusing on organization level effects of training and development. This review reports evidence supporting the theory that organizational support for training and development increases the likelihood of more positive organizational HR outcomes and enhanced performance outcomes; with the largest effects for performance and smaller effects for HR. Effect sizes for HR outcomes were possibly

affected by sample and measurement limitations and therefore could be larger. HR outcomes are such things as employee attitudes, behaviors, collective skills and competencies, and general HR metrics such as turnover. The largest HR effect sizes were associated with collective skills and competencies. Performance outcomes include productivity, sales, quality, and general performance metrics such as scales of a combination of measures. The overall effects of both categories are small, but the longitudinal studies of performance outcomes included showed that training and development increased productivity even in relation to a number of other control factors. Other included studies show that, despite the small statistical effect of training and development on performance, calculations of return on investment of training for performance tend to be substantial.

To summarize, research investigating the effects of training and development in general provides evidence that such interventions have positive effects on individual and organizational outcomes. These outcomes include measures of human capital development, human resource activity, and performance. Now that this study has provided evidence supporting a positive relationship between general training and development and individual and organizational outcomes, it turns to the effect of more specific types of training and development.

Leadership Development

Given the general lack of agreement on and acceptance of a clear distinction between leadership development and management development, much of the focus of this research literature shows a great amount of overlap between what constitutes leadership development and what constitutes management development. Therefore, this portion of the review combines the two topics together in order to avoid the likely redundancy that would result if each were given a separate section. To begin, the orientation will lean toward the stream of research that focuses

leadership, followed by a shift toward that research which focuses on management. The literature presented here is generic in orientation or focuses on the private sector. A section devoted to leadership development in the public sector is presented later.

In his well-regarded textbook, Yukl (2006) devotes a chapter to developing leadership skills. He characterizes most leadership development programs as becoming more and more a "series of …opportunities" "designed to increase generic skills and behaviors relevant for managerial effectiveness and advancement," rather than an event occurring "once or twice" during a career. These opportunities can take on a number of different forms, such as different types of formal training, work-based experiences, or self-help activities. He provides a framework of research-supported characteristics of effective leadership development programs, indicating that leadership development, when properly structured, can cultivate beneficial leadership skills and competencies, which can in turn enhance organizational effectiveness.

Day (2001) provides a review in which he draws a clear distinction between leadership and management development. Management development provides training in "position- and organization-specific" skills and knowledge whereas leadership development is an expansion of the "collective capacity of organizational members to engage effectively in leadership roles and processes" beyond organizational structures.

Day further draws a distinction between leader and leadership development. Leader development focuses on the improvement of human capital, the individual, and their personal "knowledge, skills, and abilities associated with formal leadership roles." Leadership development orients around the enhancement of social capital, the fostering of interpersonal relationships that produce benefits for the organization. In his review, Day identifies six of the most common forms of leadership development being employed in organizations today. These

are, 360-degree feedback, executive coaching, mentoring, networking, job assignments, and action learning. He provides a description and assessment of each, including strengths and weaknesses, and whether each has a human capital orientation, as social capital orientation, or both. He concludes that no single form is necessarily superior, or inherently effective. Instead,

> effective leadership development is less about which specific practices are endorsed than about consistent and intentional implementation. A key to effective implementation is having the organizational discipline to introduce leadership development throughout the organization, rather than bounded by specific (usually top) levels. Another key to effectiveness is linking initiatives across organizational levels and in terms of an overall developmental purpose within the context of a strategic business challenge (Day 2001, 606).

This finding provides support for the idea that effective leadership development as a whole is affected less by the content of the program than the consistent support given organizationally to the maintenance and promotion of the program.

In a meta-analysis published in 2004 by Collins and Holton, the authors acknowledge the often fuzzy distinction between management and leadership development. Consequently, they adopt the term "'managerial leadership development' to integrate the traditional managerial and leadership behaviors … when those behaviors are different but complementary" (2004, 220-221). The analysis encompasses 83 studies from 1982 – 2001, a time period during which, according to the authors, an evolution in the roles of managers and the orientation of management development occurred, bringing the concept of leadership development into prominence and melding management development into leadership development. As a result of the changes during this period, the term "managerial leadership development" can also refer to this evolution in training focus.

The studies contained in this analysis concentrate on the benefits realized through development programs at the individual, group, and organizational level. From their analysis,

Collins and Holton found that leadership development had a significant and positive effect on knowledge outcomes, where knowledge was principles, facts, attitudes, and skills learned as a result of the training measured using both subjective and objective measures. The authors also found that training had a significant positive effect on expertise/behavioral outcomes (although somewhat less so than knowledge). Expertise/behavioral outcomes were changes in on-the-job behavior also measured both subjectively and objectively. The results of this meta-analysis show that development for leaders enhances knowledge, skills, competencies, and has positive effects on leader behavior.

Finally, it is important to reference an older meta-analysis by Burke and Day (1986), in part for the reason that it is frequently cited and considered by some to be the study that provided the most convincing evidence of the usefulness of manager development. The research analyzed in this study precedes many of the advances made in development program evaluation and prescriptions for effectiveness, but the results show that even early attempts by organizations to design manager development programs had success with producing positive outcomes. The authors examined 70 studies published between 1951 and 1982, finding that on average various types of managerial training are moderately effective in improving knowledge and job performance. They also conclude that this improvement effect can have "substantial economic impact on the organization."

In summary, a large body of research investigating the effects of leadership development provides evidence of the enhancements it provides for the organization and the steps an organization can take to make sure it is effective. Organizations can realize a number of benefits from leadership development, including performance improvements, increased knowledge, skill, and competency capacity in its cadre of leaders, and a greater likelihood of beneficial behaviors

from this group. In addition, leadership development is made most effective through the consistent support of the organization.

Leadership Development in the Public Sector

Despite the importance that numerous sources have placed on the necessity of adequately developing leaders in the public sector, very little research has been done in this area. This is surprising, given the persistent calls by politicians, academics, and bureaucrats for improvements in both public sector management and organizational performance. Perhaps the topic is overlooked as a consequence of the difficulty in collecting concrete data related to development programs. On the state and local levels, it is likely very tricky to acquire useful and standardized data from multiple sources, relegating the researcher to conducting case studies of accommodating organizations. On the federal level, as will be described below, spending for development and individual employee participation in development opportunities has only recently begun to be collected in a centralized database. Thus access to certain types of data useful to conducting research projects has been unavailable. In spite of these difficulties, a few scholars and agencies have attempted to develop some empirical insight into the development of leaders in the public sector. The review in this section will begin with those few studies employing empirical research methods and then move to the literature that presents normative arguments in favor of the benefits of leadership development.

A study by the U.S. Postal Service referenced in a book chapter by Cameron and Ulrich (1986) provides limited evidence of the effect that management skill training had on the performance of 49 of the 100 largest post offices. The organizers of the study gathered productivity and service quality data over a period of five years. They found that investment in training had a substantial influence on these two measures. More specifically, the data showed

that training which developed management skills had a larger effect on productivity improvements and service quality than technical skill training. The study also found that technology did not dampen the effect, in fact, office with less assistive technology outperformed offices with more assistive technology when managers of low-tech offices received management skill training.

Ban and Faerman (1990) report on an evaluation of a development program that they conducted for the State of New York. Despite noting the difficulties that exist in conducting training evaluations, they felt confident that their study showed positive effects in the relationship between management training and beneficial changes in supervisory behavior. In eight different measures of behavior, each showed statistically significant positive increases after a three month time period as compared to the measures prior to attending a three-day development course. Even more importantly, these increases persisted when re-evaluated at the six-month mark, providing evidence that the behavior changes had become ingrained in the participants. The authors further corroborated these positive results with in-depth interviews and the independent assessments from the participants' supervisors. Although this study represents a single case, it provides evidence that leadership development programs can have positive effects on manager behavior even in highly structured bureaucracies such as that in New York State.

In another analysis of the same data conducted by Faerman and Ban (1993), the authors found evidence that when the participants in development courses feel that the quality of instruction is good and have overall positive reactions to the course, these perceptions may encourage participants to transfer what they have learned in training over to their work environment. The effect of this relationship was moderate-to-strong, indicating that participant

satisfaction with training quality may have a notable effect on their motivation to make use of the training.

Two researchers employ a survey sent to city managers and chief administrative officers in all 544 U.S. cities with a population greater than 50,000 to investigate factors contributing to public sector managerial performance. Utilizing 200 responses and following up with 20 in-depth interviews, Berman and West (2003a; 2003b) concluded that mediocre management is prevalent in U.S. cities, as defined by level of commitment by managers to public administration values and practices. The authors present solutions to this problem of mediocrity that they have culled from the responses to their survey.

One area of notable consequence to determining whether a city had low commitment management was the importance that jurisdiction placed on management training. They found that low commitment jurisdictions were far less likely than high commitment jurisdictions to require staff to engage in continuing professional development. They also found that the low commitment jurisdictions were less likely to train their managers in such areas as program evaluation, accountability, employee empowerment, and productivity improvement, among other areas. In addition to analyzing the response likelihoods, the authors also integrated their data into a structural equation model to further test the relationships. Through this model, they found that professional development had a significant effect on other aspects of managerial performance and also had a substantial cumulative effect on the model.

Van Wart (2005), in his textbook focusing on leadership in public service, points to leadership development throughout careers as a requirement demanded by the growing complexity of leadership roles in the public sector. For those organizations providing leadership development, he provides a number of support methods through which development is enhanced,

including financial support; a broad variety of development opportunities, and frequent development needs assessment.

He also identifies a number of skills that contribute to leader effectiveness. Among these are communication skills, social skills, influence skills, analytical skills, and technical skills. In his view, all of these skills can be enhanced through development programs. Van Wart makes a point of distinguishing the importance of technical skills for leaders, defining them as "the basic professional and organizational knowledge and practice associated with an area of work" (Van Wart 2005, 146). In this definition, Van Wart is not just referring to the "hard" technical knowledge of the occupation (such as the understanding of the scientific principles of jet propulsion for NASA managers, for example), but also basic management skills such as "managing and leading teams, leading meetings, basic operational problem solving, and rudimentary operations planning" (Van Wart 2005, 147). He points out what can often become a problem in management is that leaders at all levels are presumed to have these basic skills, with the consequence that necessary training and development in this area to function as a successful manager is overlooked.

Paddock (1997) recognizes a need to establish training benchmarks for successful management development programs in government. In order to identify these standards, she surveyed the directors of accredited Certified Public Manager programs in fifteen states, asking them to identify their "best practices." She received responses from twelve and from this information identifies thirty-eight benchmarks in ten areas. These ten areas are: Oversight and Leadership of the Program; Stability of Administrative and Financial Support; Consistent Management Philosophy; Administrative Control; Selection and Support of Participants; Accessibility; Preparation for and Application of Classroom Learning; Quality of Program

Delivery; Evaluation of Participants; and Ongoing Program Evaluation. The author asserts that, though some refinement is needed to the benchmarks, they can be applied to any development program and used for both program creation and evaluation.

Finally, a recent book by Bilmes and Gould (2009) calls attention to the importance of managing human capital as a means of increasing government performance. The authors draw cases from successful organizations in the private sector, the military, and the public sector to develop a framework for revamping the entire federal human capital management system in order to create a stronger, more capable, and higher performing population of civil servants. They identify training and education as "the most powerful levers for reform in government today" (Bilmes and Gould 2009, 173).

Bilmes and Gould emphasize how important training is for managers and supervisors, yet they call attention to the fact that, more often than not, an individual is promoted to a managerial position in the federal government without training in "how to lead, manage, and evaluate subordinates," contrary to standard practice in the military and high-performing private sector companies. In their opinion, every manager who supervises or manages other employees should be held to basic standards of competence, an expectation that does not currently exist in the federal government. These standards of competence need to be established, with the authors suggesting the Certified Public Manager program as a guide. Once standards are established, those who meet them can be provided credentials attesting to their basic level of competence.

In addition to this credentialing process for managers, the authors call for strong investment in four types of training – leadership/management, supervisory, technical, and general transformation training. The most important type of training in their view is leadership and managerial training. This training should include "how to structure work assignments; set

goals and objectives; measure, monitor, and evaluate performance; motivate employees; and handle poor performers" (Bilmes and Gould 2009, 183). Supervisory training should focus on the skills needed by those managers who manage the daily function of public administration, have direct managerial contact with the bulk of non-supervisory employees, and should have employee performance as their main concern. This type of training is necessary to ensure that these supervisors are capable of accurately and fairly evaluating employee performance, providing constructive feedback to promote improvement, and identifying areas where formal training is needed.

To summarize, the body of research literature focusing on leadership development in the public sector is small. Some empirical work has been conducted, finding positive effects of leadership development on performance and leader behavior. But this work is limited to single training interventions or single organizations, or limited by the scope of the measures employed. The rest of the work encompasses normative arguments in favor of leadership development, but does not develop empirical evidence to support the assertions made. The review now turns to the context and environment of leadership development in the federal government, where a great deal more information regarding the topic is available.

The Context and Environment of Leadership Development in the Federal Government

Overall, evidence indicates that the federal government does not do an adequate job of developing its leaders and preparing them for the challenges of positions of authority. The second National Commission on the Public Service identified the need for managers to have the "appropriate experience, training, and skills to manage effectively" as an area of "particular importance" to the organization of government administration (National Commission on the Public Service 2003). Additionally, the Commission concluded that the government falls short in

needed efforts to "identify potential management talent" and "nurture it through adequately and consistently funded training (and) professional development." The Government Accountability Office identifies successful training and development programs at all employment levels as a key contributor to high agency performance, but sees the need for improvement in these areas throughout government (United States Government Accountability Office June 2005; United States Government Accountability Office February 2004). The Partnership for Public Service and Grant Thornton LLP surveyed the federal government's chief human capital officers (CHCO) in 2008 and found that "only 44 percent of CHCOs believe that federal managers and supervisors possess the supervisory or managerial competencies they need 'to a great extent,' and none of the respondents believe federal managers overall deserve the highest rating, i.e., 'to a very great extent'" (Partnership for Public Service and Grant Thornton LLP 2008, ii). A study conducted by the Office of Personnel Management in 2001 found that only 11 percent of participants in the USDA Graduate School's *Introduction to Supervision* course were doing so as part of a leadership development program (United States Office of Personnel Management 2001). The study further found that only 4 of 20 agencies surveyed had formal leadership development programs to prepare non-supervisory employees to become supervisors. A panel of the National Academy of Public Administration found in 2003 that for the most part federal agencies do not do a good job of developing and training first–line supervisors, noting that they are often left out of agencies' leadership development programs (National Academy of Public Administration 2003).

As indicated in these government studies, the consensus assessment is that the federal government has not done a very good job overall of establishing a basic structure across all executive branch organizations for the identification and development of leadership talent. One

consequence of the neglect described above is that in many cases, rather than identifying employees with the ability and desire to take on leadership roles early in their careers and fostering their desire to achieve leadership roles in the agency through structured leadership development programs, many federal organizations may leave leadership and managerial skill development decisions, as well as the pursuit of opportunities, to the employee with little guidance as to what skill-sets are valued and needed by the organization.

Another potential consequence of neglect of early identification and development of leadership talent is that many leaders enter their roles as a consequence of tenure of service – the next level of promotion is a position with authority over other employees. Reaching the position of leadership by default, without active development, leaves these new leaders with new duties and responsibilities for which they have not been prepared. Thus, the employee may not have the knowledge of managerial and leadership skills necessary to adequately meet the demands of the leadership role. They are then required to execute the leadership role of the new position at the same time as they scramble to figure out what fundamental skills and competencies they need to help them function effectively as a leader and if they can secure the necessary development opportunities. Both scenarios described here point out the consequences of lack of organizational support for leadership development, evidence for which is provided by studies referenced in the previous paragraphs.

There are a number of potential negative organizational impacts as a result of this lack of support for leadership development. Evidence of negative impacts likely related to widespread organizational neglect of leadership development is revealed in the results of several federal employee surveys. In the 2005 Merit Principles Survey, 67% of supervisors reported that they needed training to overcome a deficiency or close a gap in their skill set (United States Merit

Systems Protection Board 2007). In addition, only 56% of employees responding to this survey reported that their supervisor had good management skills. Another survey of federal employees that provides evidence reinforcing this trend is the 2006 Federal Human Capital Survey. In this survey, 63.8% of employees reported that they trust and have confidence in their supervisor. 66.8% of employees responded positively to a question regarding the quality of the job being done by their supervisor. In addition, only 49.2% of employees reported having a high level of respect for their organization's senior leaders (United States Office of Personnel Management 2007). In the 2008 Federal Human Capital Survey, the responses to these questions were 64.2%, 66.2%, and 51.8% respectively (United States Office of Personnel Management 2009b). In the 2007 Merit Principles Survey, 67% of employees conveyed positive opinions about their immediate supervisor's performance as a supervisor. 44% of respondents indicated that they have a high level of respect for their organization's senior leader. But most importantly, only 51% of leaders reported that their training needs are assessed and 28% or fewer of leaders specified that they received formal training in important personnel management skills such as performance evaluation, the effective use of feedback, and helping employees improve their performance (United States Merit Systems Protection Board 2009b). The results of these surveys provide strong evidence that, as a whole, government agencies are not doing a very good job of developing leaders that feel adequately prepared for their job responsibilities – deficiencies that are being perceived by subordinates with a detrimental effect on leader effectiveness.

The lack of funding and policy structure supporting training and development in the federal government in general, and consequently leadership development, are likely influences that have shaped the current deficient situation. Agency budget allocations dedicated specifically to federal employee training and development are practically non-existent. OPM ceased

collecting information on agency training and development budgets and activities after 1992 in the effort to reduce paperwork (Voinovich 2000). Efforts to collect this data on an employee-by-employee basis began recently as a component of OPM's new Enterprise Human Resources Integration (EHRI) initiative, but this data has not yet achieved a level of coverage sufficient for analysis.

Reports that have sought to establish spending levels on training and development bear out the anecdotal and survey evidence that it is inadequate. The National Commission on the Public Service report of 1989 indicated that the government spent "about three-quarters of 1 percent of its payroll dollars on civilian training, compared with 3 to 5 percent in the most effective private firms" (National Commission on the Public Service 1989a, 43). An inquiry by Senator Voinovich for the Subcommittee on Oversight of Government Management, Restructuring, and the District of Columbia reported a survey of nine agencies indicating that between 1997 and 2000 they spent an average of 1.99 percent of the payroll budget on employee training and development (Voinovich 2000). Individual agency spending ranged from 4.75 percent to .58 percent. Many of the agencies acknowledged that the percentages might not be accurate representations of the total amount spent on training and development.

The average percentage of payroll spent by those private organizations recognized for excellence in employee training and development by the American Society for Training and Development was 4.16 percent in 2004, and 2.97 percent in 2006. The same organization reported that a sample of government organizations reported spending an average of 1.39 percent of payroll on training and development in 2004 and 1.54 percent in 2006 (American Society for Training and Development 2004; American Society for Training and Development 2007). This sample includes all government levels and could likely include state or local governments. That

being said, it does provide more evidence of government under-spending on training as compared to top performing private sector organizations.

This data provides substantiation that, on average, federal agencies under-fund training overall in comparison to top private organizations. Combined with this problem of chronic under-funding, support exists for the assertion that training and development is one of the first areas cut in tough budget conditions. The Voinovich (Voinovich 2000) report makes the point that training and development funds are often strongly affected by budget cuts, as these expenditures come from the same accounts as fixed costs such administration, payroll, and physical plant – otherwise referred to as general operating funds. Supervisors surveyed by the Office of Personnel Management in 2001 affirmed that money for employee development is often the first expense cut during tight budget situations, with leadership development being the first area targeted (United States Office of Personnel Management 2001).

In addition, public laws and regulations establishing federal employee training and development policies tend to be very vague, not laying out specific expectations of standards or implementation. For example Title 5, Part III, Chapter 41 entrusts the head of the agencies with the establishment of training and development programs, but leaves the details of those programs up to the head of the agency, subject to regulations developed by the Office of Personnel Management. Section 4121 requires the head of the agency to establish a "comprehensive management succession program to provide training to employees to develop managers for the agency" and a

> program to provide training to managers on actions, options, and strategies a manager may use in—
> (A) relating to employees with unacceptable performance;
> (B) mentoring employees and improving employee performance and productivity; and
> (C) conducting employee performance appraisals.

Federal regulations under Title 5, Part 412 establish no more detail as to the standards of leadership development other than that a program should exist and that it should develop competent and well-qualified managers and candidates for management positions. Nothing in the regulations establishes standards to qualify as competent and well qualified. Nowhere in the regulations is there a minimum level of training hours per year required for management employees or a minimum level of spending expected. OPM provides guidelines and suggestions for agencies to follow when establishing a leadership development program, but no mandatory standards. Nowhere in the law or regulation is there a requirement that agencies identify and prepare candidates for leadership positions.

The consequence of both the lack of budgetary priority and vagueness of standards in the laws and regulations has been an inconsistent development and emphasis on leadership development programs across federal agencies. As is often the case in government, when a program is not explicitly funded and/or when the program expectations are vague and standards are not legally established, often such a program ends up ill formed and neglected. The Partnership for Public Service refers to this problem when it alleges that some agencies view the requirement to create and implement strategic human capital plans as a "paperwork exercise rather than an opportunity to develop a valuable tool to improve engagement of their employees" (Partnership for Public Service 2008b, 8).

While there is obvious benefit in allowing agencies the flexibility to customize training programs to their individual needs, such flexibility can result in large variations in program capacity, structure, and importance. These variations, due to the lack of baseline standards and expectations of training program adequacy, result in some agencies employing elaborate programs which are strongly promoted to employees and some agencies maintaining a program

in name only, meeting the minimum regulated requirements, with other agencies' programs falling in between these extremes. Evidence of such variation is shown in the disparity in spending on training as a percentage of payrolls among agencies described above in the Voinovich report. Further proof is evident in the variation between agencies in responses to training related questions on federal employees surveys such as the 2008 Federal Human Capital Survey and the 2007 Merit Principles Survey. The likelihood of inconsistency of development across agencies is supported by evidence from the 2008 Federal Human Capital Survey. Response rates to the question, *I am given a real opportunity to improve my skills in my organization*, ranged from 13.7 – 40.9% across agencies for "Strongly Agree" and from 29.2 – 53.0% for "Agree." Response rates to the question, M*y training needs are assessed*, ranged from 5.2 – 23.4% across agencies for "Strongly Agree" and from 22.1 – 49.7% for "Agree" (United States Office of Personnel Management 2009b). This lack of overall baseline structure in leadership development required across agencies and the differences in leadership development support between agencies such a situation allows to develop serves as the basis for the organizational level of comparison chosen for this study.

To summarize the context and environment of leadership development in the federal government, reports from various government sources provide extensive information indicating problems with leadership and problems with leadership development, but is not able to explicitly link the two. These reports rely for the most part on survey data and anecdotal evidence, which points to the problems but does not provide evidence of a relationship. This evidence, combined with the structural deficiencies related to training and development is sufficient enough to justify further investigation of the potential relationship between support for leadership development

and leader skills, competencies, and behaviors, as well as measures of performance, as they vary among organizations in the federal government.

In summary of the literature as a whole, the body of research focusing on the private sector far exceeds that oriented toward the public sector. The literature provides strong evidence that training and development in general enhances employee skills, competencies, and behaviors as well as, performance. Leadership development research shows support for same effect for leaders. These positive effects on individuals also benefit organizations as a whole. Research investigating leadership development in the public sector needs greater attention, indicated by the lack of literature focusing on this sector and the strong evidence provided from government sources that leadership development is neglected to the possible detriment of public sector performance. This study seeks to fill a small part of that public sector research gap.

CHAPTER 3

THEORETICAL FOUNDATIONS

The literature reviewed in the prior chapter provides evidence of a strong theoretical foundation for the beneficial effect of organizational support for leadership development on such organizational outcomes as collective leader skills, competencies, and behaviors, as well as, organizational performance outcomes. This chapter develops a theoretical framework and model incorporating the evidence from the literature and other sources. The case is made for the viability of a model of effect transference from organizational development support through the development process to organization-level skills, competencies, and behaviors and further to organizational performance.

Leader Development in the Federal Government

The hypotheses and the effects proposed in chapter 4 are premised on the idea that current and prospective leaders in the federal government have ample, high quality opportunities available to expand their leadership skills and competencies. Any hindrance of the pursuit of leader skill and competency development is not a product of the lack of adequate and high quality training and development options. Rather it is a product, in part, of a deficit of organizational support for leader development and, consequently, of the subsequent impediment to taking advantage of the available education possibilities.

Support for this assertion of the availability of high quality development is found in the OPM 2008 Annual Performance Report. According to OPM's assessment of the leadership education programs it offers, abundant opportunity exists for leaders from all levels to engage in

high quality leadership and management development. The Center for Leadership Capacity Service "offers leadership education programs for Federal employees from entry level team leaders to Senior Executives and succession planning and custom leadership development programs for agencies" (United States Office of Personnel Management 2009, 33). These opportunities are organized into clearly defined programs of development oriented toward levels of leadership authority – Team Leader, Supervisor, Manager, and Executive. OPM survey results support the quality and applicability of the training offered, with satisfaction scores of 4.51 out of 5 and a 60% increase in perceived learning as assessed by participants.

The opportunities for education provided by OPM are not the only development options, as agencies may pay for tuition and expenses for privately provided leadership education opportunities, such as graduate school. In addition to the options offered by OPM and those funded by government but privately provided, OPM provides a framework and advisory services to support the creation and enhancement of leadership development programs within individual organizations. This allows each organization, if they so choose, to customize and institutionalize the leadership development process to meet the unique needs of the organization. Taken together, the evidence provided above illustrates that ample opportunities exist for the high quality development of leaders in the federal government, isolating the level of organizational support for such development as a deciding factor to determine the adequacy and effectiveness of the process.

Importance of Organizational Support for Leadership Development

Organizational support plays an important role in the leadership development process. The Center for Creative Leadership produces the well-respected *Handbook of Leadership Development*. This handbook describes assessment and support as two of three key factors that

enhance leadership development activities (Van Velsor et al. 2010). Assessment includes the evaluation of individual training needs, among other methods of determining the optimum course of leadership development. Support influences the effectiveness of leadership development when it comes from a number of sources within an organization, including the organizational environment, supervisors, co-workers, human resources, etc. Of particular importance to this study is that when a leader is trying to learn new skills or change behaviors, the support of his or her supervisor is fundamental for success. Van Wart (2005) also emphasizes the importance of organizational support, as described in the literature review above. In this study, the term "support" refers generally to overall support for leadership development within the organization, which includes assessment of training needs and support from the supervisor.

Skills and Competencies of Effective Leaders

A great deal of research exists identifying the skills, competencies, and behaviors that characterize an effective leader. A significant component of this body (Mumford 1997; Porter and McKibbin 1988; Whetten and Cameron 2007; Yukl 2006;) provides evidence that effective leadership skills can be taught through properly designed and adequately supported development programs. A number of skills, competencies, and behaviors reflective of these skills and competencies have been identified through scholarly research as critical to an individual functioning as an effective leader. These attributes are listed in Exhibit 3.1.

Assuming that organizations which invest resources in the development of leaders desire that those development opportunities produce more effective leaders, it can be expected that the content of the development opportunities would include the generally accepted skills, competencies, and behaviors of effective leaders. Given this, one can expect that a well-designed and supported leadership development program would expose organization leaders to these

Exhibit 3.1. Skills, Competencies, and Behaviors of Effective Leaders

Whetten and Cameron (2007)

Verbal communication (including listening)	Empowering and delegating
Managing time and stress	Setting goals and articulating a vision
Managing individual decisions	Self-awareness
Recognizing, defining, and solving problems	Team building
Motivating and influencing others	Managing conflict

Yukl (2006)

Clarifying roles/goals	Coaching & mentoring
Monitoring performance	Role modeling
Contingent rewarding	Team building
Contingent punishment	Explaining need for change
Supporting	Encouraging innovation
Providing recognition	Participative leadership

generally accepted skills, competencies, and behaviors of effective leaders. Assuming that this well-designed and supported leadership development program has been in place for a long enough period of time, it can be expected that enough leaders in the organization are educated in these skills, competencies, and behaviors to produce a density of individuals who exhibit in their behavior and actions evidence of this knowledge.

Therefore, it is reasonable to expect that organizational support of leader development, through the mechanism of high-quality development opportunities, has an effect on the aggregate skills and competencies of the organization's leaders, for the reasons laid out above. It follows, then, that those leaders who are employed by agency sub-elements that strongly support leader development, in aggregate, would possess as a result of these development opportunities a greater accumulation of skills and competencies of effective leaders than is present in those agency sub-elements that do not support leader development to the same extent. In turn, the presence or absence of these skills and competencies would be reflected in the behavior of the leaders or in the work environment in these sub-elements, in aggregate. Given that all factors laid

out above are true, measures of organizational support for leader development should show evidence of positive relationships with behaviors of effective leaders that reflect the understanding and application of skills and competencies acquired through leader development opportunities. In short, greater organizational support for leader development should result in greater organizational levels of exhibited effective leader behaviors.

Relationship between Leadership Development Support and Organizational Outcomes

At this point this study has presented research that shows organizational support is an important factor for effective leadership development. It has also established that the federal government offers a broad range of structured leadership development opportunities that are readily available to leaders and potential leaders if the organization supports employees' pursuit of such preparation. OPM organizes available development opportunities around core leadership competencies, which very closely mirror the competencies included in Exhibit 1 above. Therefore, one can reliably assume that organizations in the federal government that support leadership development would have a substantial population of leaders who are familiar with these competencies and their relevance to effective leadership, even if specific information concerning the content of development opportunities completed is not available. The general training and development and leadership development literature reviewed above provides substantial evidence that development has positive effects on behavior. Consequently, one can also expect that an organization that supports leadership development would also have a substantial population of leaders whose behavior reflects skills, competencies and behaviors of effective leaders as a result of that support. And finally, given the research described above reinforcing the idea that effective leaders can have a positive impact on organization performance, it is plausible to expect the effect of organizational support for leadership

development to carry through the process outlined above and influence organization performance.

Tharenou et al. (2007) have developed a model hypothesizing the very effects and organizational outcomes described above, except for the initial impact of organizational support. In their model, development at the organizational level has a direct effect on human resource outcomes at the organizational level, described as collective attitudes and motivation, collective behaviors, and collective knowledge, skills, and abilities. Development also has an indirect effect on organizational performance outcomes, mediated through the human resource outcomes. The model is represented graphically in Figure 3.1.

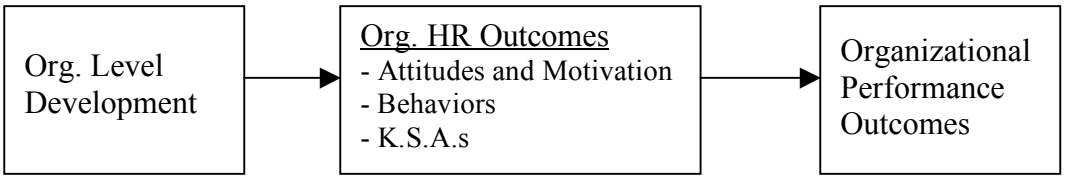

Figure 3.1: Tharenou et al. Model of Development Effect

In order to adapt Tharenou et al.'s model to fit the theoretical impact of organizational support for leadership development described above, one simply needs to reframe the general organizational level factor *development* as exclusively of organization leaders rather than the whole organization. Next, recharacterize *HR outcomes* as the *organizational capacity of effective leadership outcomes*. To this model *organizational support for leadership development* is added as an antecedent of *organizational leadership development*, indicating a direct effect on *organizational leadership development* and an indirect effect on the *organizational capacity of effective leadership outcomes*, mediated through *organizational leadership development*.

Organizational support for leadership development also has an indirect effect on *organizational performance outcomes*, mediated through both leadership development and HR outcomes. This is the theoretical model tested in this study and is represented graphically in Figure 3.2.

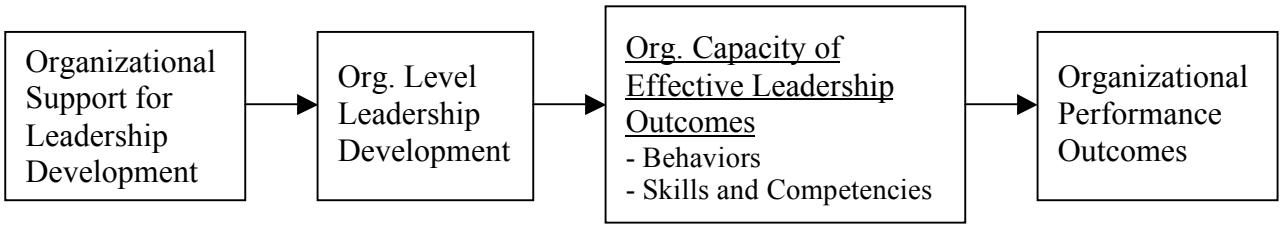

Figure 3.2: Model of Organizational Support of Leadership Development Effect

The theoretical model developed in this chapter provides the framework for the hypotheses developed in chapter 4 and the regression models analyzed in chapter 5. It explains the basis for the relationships hypothesized below – that organizational support for leadership development can have a positive effect on organizational outcomes reflecting effective leadership behaviors, skills, and competencies, as well as organizational performance.

CHAPTER 4

HYPOTHESES

The hypotheses developed for this study are grounded in the evidence of training and development effects presented in the research reviewed in prior chapters. Based on the support from this research for the effects of development on organizational leadership competencies, behaviors, and actions as well as organizational performance, the following hypotheses reflect an aspect of the theoretical model constructed above. This model proposes generally that the level of support organizations provide for developing their leaders will have a positive relationship with a number of organizational outcomes related to beneficial and effective leader competencies and behaviors. In simple terms, greater support for leader development should produce better leaders and, consequently, better organizational performance. In this study, the effects will be tested in the context of the federal government.

The following hypotheses are divided into two categories, the first focusing on the organizational capacity of perceived effective leadership outcomes that are an expected consequence of developed skills and competencies of effective organizational leaders. Due to the evidence and theoretical arguments presented above, these outcomes are expected to manifest at greater levels in organizations that more strongly support leader development. The second category develops a set of propositions about perceived organizational performance outcomes. Based on past research and the theory developed in previous chapters, it is expected that organizational support of leader development should positively affect perceived organizational performance.

Skills, Competencies, and Behaviors of Effective Leaders

Goal Setting

H1: Organization personnel in both leadership and non-leadership positions report higher levels of leader goal management skill when organization leaders report greater support for their own development.

Exhibit 3.1 establishes goal setting as a skill, competency, and behavior of effective leaders. In addition, a number of streams of research in the social sciences have established the setting of goals and the monitoring of progress toward the achievement of those goals as an important activity in the enhancement of individual and organizational performance (Daft 2007; Rainey 2003; Schermerhorn, Osborn, and Hunt 2005). Crucial to the effectiveness of goals is how clearly employees understand what they need to do to achieve them. In addition, research has shown that motivation can be enhanced if employees are able to connect their work to the achievement of organizational goals (Locke and Latham 2002). Thus, organizational support for leader development should be positively related to leader action to clarify and evaluate progress toward goals.

Empowerment

H2: Organization personnel in both leadership and non-leadership positions report higher levels of work process empowerment when organization leaders report greater support for their own development.

Exhibit 3.1 also lists empowerment as a skill, competency, and behavior of effective leaders. Allowing employees the ability to exert power over determining how their work is executed and providing opportunities to take on leadership roles have been shown to produce beneficial effects in the public sector workplace (Rainey 2003). Research provides evidence that

when employees are allowed greater control in deciding how to go about their jobs, they experience heightened levels of motivation and self-efficacy (Bandura 2001; Deci and Ryan 2002). In addition, granting decision-making authority can have other beneficial outcomes, such as enhanced performance and commitment (Whetten and Cameron 2007). It is plausible that a critical mass of leaders who work in organizations that support their development would possess awareness through that development of the benefits of empowering employees that they lead. Therefore, organizational support for leader development should be positively related to general employee perceptions of workplace empowerment.

Communication

H3: Organization personnel in both leadership and non-leadership positions report improved levels of communication between management and staff when organization leaders report greater support for their own development.

Communication is vital to effective leadership, so explains its inclusion in Exhibit 3.1. Leaders must be able to organize and direct the efforts of the employees that they manage. To do so requires the ability to clearly define goals, roles, tasks, and expectations for staff, among the myriad of other pieces of information that need to be conveyed in a coherent fashion as part of the process of functioning effectively as a leader. Because competency in communication is one of the most important characteristics of an effective manager, it is a key component of a well-designed and supported leadership development program. A cursory review of the content of leadership development opportunities available across the public and private sectors shows the importance placed on the enhancement of communication skills. Given this emphasis on communication skills development, it is expected that leaders in organizations that more strongly support leader development will generally show a greater aptitude for communication, as they

have had more exposure to related development opportunities. Therefore, organizational support for leader development should be positively related to general employee perceptions of leader communication aptitude.

Performance Evaluation

H4: Organization personnel in both leadership and non-leadership positions report a more valuable experience from the performance evaluation process when organization leaders report greater support for their own development.

The evaluation of employee performance is a key role held by leaders. It therefore deserves inclusion the list of effective leader skills, competencies, and behaviors listed in Exhibit 3.1. The effective assessment of performance is not limited to a formal annual or semi-annual meeting to discuss employee achievement of goals and expectations determined during the prior meeting. Performance evaluation can occur at any time if the situation warrants. For example, recognition and praise for the successful completion of a project or counseling in response to low quality work output is a form of performance evaluation. Yukl (2006) refers to this as monitoring performance, Whetten and Cameron (2007) views this as a component of motivating and influencing others. Performance evaluation is a standard practice in both the public and private sectors; therefore leaders actively engaged in leadership development should be exposed to effective performance evaluation techniques as a standard component of high-quality development programs. As a result, organizational support for leader development should be positively related to employee perceptions of derived value from their performance evaluation experience.

Meritocratic Principles

H5: Organization personnel in both leadership and non-leadership positions report higher levels of meritocratic decision-making by leaders when organization leaders report greater support for their own development.

Grounding the actions of leaders in the principles of fairness and merit are keys to maintaining legitimacy of authority and organizational morale (Rainey 2003; Whetten and Cameron 2007; Yukl 2006). Even more so than in the private sector, the public sector environment places additional demands on the behavior of managers, both structurally and institutionally. Since the time of the Pendleton Civil Service Reform Act of 1883 and the subsequent reforms to government employment and management practices, personnel management in the federal government has sought to adhere to meritocratic principles, both through legal obligation and institutional expectation. These principles stipulate in part that employees be promoted and rewarded based on their abilities and the quality of their work performance.

In addition, according to meritocratic principles, federal employees should be treated fairly and impartially in instances of leader decision-making that affects their status in the workplace. Due to both the prospect of legal consequences as a result of violation of meritocratic principles in leader actions and institutional expectations of behavior, an important component of leader development in the federal government is understanding and applying meritocratic principles as they related to workplace actions. OPM lists it as a "fundamental" of supervisory development. Therefore, it is reasonable to expect that those leaders who work in federal government organizations that more strongly support leader development are aware of the importance of adhering to principles of fairness and merit in their actions. Consequently,

organizational support for leader development should be positively related to employee perceptions of how meritocratically leaders in their organization act.

Motivating Others

H6: Organization personnel in both leadership and non-leadership positions report a higher level of leader-inspired motivation when organization leaders report greater support for their own development.

Motivation is a complex psychological construct of which the study of those factors that enhance or temper its manifestation has seen some agreement and much disagreement. The individualized nature of motivation contributes to the difficulty in developing broadly generalizable and usable techniques to enhance motivation. However, it is generally agreed that motivation is affected by how an individual perceives his or her treatment by an individual with direct authority over them (Bandura 2001; Deci and Ryan 2002; Locke and Latham 2002; Rainey 2003). Despite its complexity and the difficulty associated with influencing it, enhancing motivation is included in Exhibit 3.1 as a skill of effective leaders.

Leaders who are identified as effective are often those who have the ability to shape their actions in a way that enhances the motivation of their charges. While it may be may be difficult to teach leaders how to motivate employees, research (Bandura 2001; Deci and Ryan 2002; Locke and Latham 2002; Rainey 2003) provides evidence for the type of behaviors that demotivate individuals. A survey of the content of leadership development programs, public sector and private sector, shows that enhancing employee motivation is one of the key "soft skills" emphasized. Given this information, it is expected that leaders who work in an organization that is supportive of their development would be more likely to experience exposure to broad scope of leadership techniques and competencies oriented toward fostering personnel

motivation. Therefore, organizational support for leader development should be positively related to overall employee perceptions of how well organization leaders inspire motivation.

Organization Performance Outcomes

As described in the literature reviewed above, theory, combined with anecdotal and research evidence has provided as strong foundation for the assertion that the importance an organization places on leader development has a positive effect on organizational performance outcomes. Therefore, it is expected that evidence of organizational support for leadership development will have a positive effect on a number of organizational measures of performance. This second set of hypotheses is based on this premise.

Leader Performance

H7: Organization personnel in both leadership and non-leadership positions report higher levels of leader performance when organization leaders report greater support for their own development.

Leader development is undertaken with the expectation that participation improves skills and competencies, making leaders able to realize enhanced performance in their roles. Organizations that are more supportive of leader development should have a greater density of leaders who have learned effective leader skills, competencies, and behaviors. The presence of a greater density of effective managers should be reflected in higher levels of leader performance, as perceived by all employees of the organization. If this is true, then organizational support for leader development should be positively related to organization-wide employee perceptions of leader performance.

Talent Utilization

H8: Organization personnel in both leadership and non-leadership positions report higher levels of talent utilization when organization leaders report greater support for their own development.

Talents are a uniquely individual characteristic. Some personnel may be talented in leadership and wish to take on leadership roles. Others may be talented in completing assigned technical work and wish to focus their efforts there, rather than take on leadership roles. Talents useful in the workplace also may take on many other forms. A key component of leader development and a competency of effective leaders is the ability to foster individual and unit performance. Employees who feel like they are operating at a higher level of personal performance likely feel that way if they felt their talents were being utilized. If they have untapped talents, they would likely perceive that they have excess performance capacity that is being wasted. Therefore, if this is true and organizational support for leadership development results in a density of organization leaders who are able to enhance employee performance throughout the organization, organization personnel should report higher levels of talent utilization when organization leaders report greater support for their development.

Work Quality

H9: Organization personnel in both leadership and non-leadership positions report higher levels of work quality when organization leaders report greater support for their own development.

Organizational work quality can be viewed as a comprehensive measure of the ability of leaders to function effectively. If organization leaders are deficient in any, some, or all of the skills, competencies, and behaviors of effective leaders presented in this study, a likely consequence is a lower level of organization work quality. Those organizations that support leadership development are more likely to have a density of leaders prepared to employ effective

skills, competencies, and behaviors throughout the organization. The consequence of this widespread application of effective leadership is that work quality attains a higher level through the leaders' influence on performance, as supported in previous chapters. As such, all organization personnel should report higher levels of work quality when organization leaders report greater support for their development.

CHAPTER 5

DATA

This chapter describes the data incorporated into this study of leadership development. The measures of greatest interest originate from a well-known federal government survey of personnel. This study incorporates a number of control measures from another source of federal personnel data, to provide some measure of independence from single source bias in the analysis. This chapter will proceed as follows. First, the data used to examine the study hypotheses is described. Next, the operational definitions of the independent, dependent, and control variables are explained; including the data sources and measurement scales. These explanations also include the various data transformations necessary to conduct the appropriate analysis of the hypotheses.

The goal of this study is to investigate if significant statistical relationships exist between all employee perceptions of leader skills, competencies, and behaviors, as well as performance and leader perceptions of support for their own development at the organizational unit level of analysis. The survey employed in this study collects the perceptions of a large number of individual employees from a broad cross-section of 76 federal government organizations, such as the Department of Defense, the Department of Justice, etc. Agencies included in the survey are listed in Appendix B. The data can be further sub-divided into 272 sub-elements of these 76 organizations, which represent offices, bureaus, or other smaller organizational components of the larger organization. Examples of such sub-elements include the Defense Logistics Agency,

the Defense Contract Management Agency, etc. within the Department of Defense and the Federal Bureau of Investigation, the Anti-Trust Division, etc. within the Department of Justice.

For the purposes of this study, I have chosen to select the sub-element level of organization as the unit of analysis. I chose the organization sub-element over the more general organization level of analysis because the possibility exists for variation between sub-elements of the same organization. Such variation may be due to factors such as unequal distribution of development resources among the sub-elements of a single organization or due to the cultural value the particular sub-element may put on leadership development. While the organization overall may have a culture supportive of leadership development, that culture may be stronger or weaker among the various sub-elements, variation that is useful to this analysis.

As a consequence of this choice, all data is aggregated to the sub-element organizational level. While this may result in a loss of variation and the ability to analyze individual responses, it provides a number of advantages. First, it allows for an overall perspective on the impact of leadership development support at the organization sub-element level. At the organization sub-element level, if statistically significant effects are present, such a result provides strong evidence of the pervasive impact of leadership development support on the organization sub-element, not just on the individual. Second, it minimizes the problem of over-representation by large organizations in the study and under-representation by small organizations. The effects of leadership development support within all organizations, regardless of size, are of foremost interest in this study. Over-representation or under-representation may introduce statistical influences that the data in this study is not able to control for. Finally, analysis at this level can minimize the statistical effect of data outliers by averaging the effect of the measure for all the cases associated with that sub-element.

The data for this study is gathered from the calendar year 2008. Two main sources, the 2008 Federal Human Capital Survey (FHCS) and the Central Personnel Data File (CPDF), serve to populate most of the measures. The FHCS is a survey administered by OPM that "focuses on employee perceptions regarding critical areas of their work life, areas which drive employee satisfaction, commitment, and ultimately retention in the workforce" (United States Office of Personnel Management 2009b). OPM characterizes it as "a tool that measures employees' perceptions of whether, and to what extent, conditions that characterize successful organizations are present in their agencies."

Full-time, permanent federal employees from agencies represented on the President's Management Council were invited to participate in this survey. These agencies make up 97 percent of the executive branch workforce. In addition, all small and independent agencies were invited to participate, with 54 choosing to do so. OPM developed a probability sample of 463,545 employees to participate in the survey. Of these, 417,128 received survey instruments. In all, 212,223 employees responded for a response rate of 51%. The instrument was a self-administered Web survey. Those employees without web access were provided a paper instrument. The data can be keyed by agency and agency sub-element, allowing responses to be grouped by organization sub-element. In addition to collecting employee perceptions of their work environment, the survey also collects demographic and employment status data.

The CPDF contains human resources data on federal government personnel and is administered by OPM. This data includes the number of full-time, permanent employees that fall into various demographic categories, occupational categories, and salary categories. This data is further sub-divided by agency and sub-element, allowing agency and sub-element population characteristics to be matched to FHCS survey data.

Data Transformations

This study is conducted with a unit of analysis set at the agency sub-element level of organization. This level provides 272 cases for analysis. In order that the analysis can be carried out at the sub-element level, it is necessary to aggregate the individual-level responses within the FHCS up to the sub-element level to provide a single data point for each variable measured. To achieve this aggregation, all individual-level variable measures for each sub-element were averaged to capture the mean individual measure for each variable according to sub-element. An examination of each sub-element shows that the individual-level response frequency for each ranges from a low of 1 to a high of 6,635. The median response frequency is 551 and 266 of the 272 have a response frequency of greater than 25, providing support that, for the most part, the average responses aggregated from this data are likely to closely capture the average response for all employees within that sub-element, assuming the population of employees responding for each sub-element is representative of the population of that sub-element as a whole.

An examination of the number of sub-elements per agency shows that, as might be expected, larger agencies are made up of more sub-elements than smaller agencies, meaning that by sub-element, large agencies have a greater representation in the study population than small agencies. This fact does not necessarily present a problem for a couple of reasons. One, the large agencies would have been over-represented in an individual-level analysis by virtue of returning more responses than smaller agencies. Two, even though large agencies include more sub-elements in the population does not necessarily mean that average responses across sub-elements within the agency are homogenous. Certain sub-elements within an agency may receive greater resources, attention, and priority than other sub-elements within that agency, causing significant variations in average responses on comparable measures.

For the purposes of data analysis and to facilitate the interpretation of the interaction term included in this study, all variables were mean-centered. Mean-centering the data also compensates for the multicollinearity problems that often arise with the incorporation of an interaction term.

Dependent Variables

The dependent variables in this study measure the perception of a number of leader skills, competencies, and behaviors, as well as aspects of organizational performance. These measures are associated with the nine hypotheses developed above and analyzed in order to provide evidence in support of or against the corresponding hypothesis. Each hypothesis may be tested with more than one dependent variable measure, if multiple survey items serve as valid measures of the hypothesis's effective leadership skill, competency, behavior or organization performance outcome. The dependent variable response items and response choices for each hypothesis category are included in Appendix A. The following section describes those dependent variable measures.

All individual-level dependent variables prior to aggregation are measured on a five point ordinal scale and are coded from 1 to 5 with 1 representing the most negative response and 5 representing the most positive response. The aggregation process to the sub-element level averaged all individual level responses for each variable, creating a continuous average measure falling in the range from 1 to 5. A key element of the dependent variable measures that is crucial to the data analysis in this study is that the average of each of these measures is drawn from the full sample population of the respondents for each sub-element, without distinguishing for leadership status. This sample population is different from the sample population that the averages for the independent variables are drawn from, as will be explained later. The descriptive

statistics for each dependent variable measure as averaged at the sub-element level are presented in Table 5.1 below.

Independent Variables

The independent variables in this study measure what I have argued in the chapters above is a key factor in influencing the skills, competencies, and behaviors of effective leaders, in addition to organizational performance – support for leader development. Each of the four measures of perception of organizational support for leader development gauge a different aspect of support as perceived by employees possessing a level of formal leadership responsibility. The response items and response choices for each independent variable measure are included in Appendix A.

These four measures were not combined into a single scale measure in order to preserve the dimensionality of this study of leadership development. As described in the chapters above, development is a concept covering a broad range of actions that can contribute to the functional improvement of work activity. Combining the four measures of development into a single measure would obscure the unique contribution of each type of development action measured and result in a loss of explanatory power in this study. However, to allay any questions that these four variables are not measuring a similar concept, principal component analysis shows that all four load highly on one component, with an eigenvalue of 3.22 representing 80 percent of the total variance. The Cronbach's Alpha measure of scale reliability is 0.94.

All individual-level independent variables prior to aggregation are measured on a five point ordinal scale and are coded from 1 to 5 with 1 representing the most negative response and 5 representing the most positive response. The aggregation process to the sub-element level averaged all individual level responses for each variable, creating an average continuous measure

Table 5.1 Dependent Variables

Response Item	N	Mean	Std. Dev.
Goal Setting			
I know how my work relates to the agency's goals and priorities.	272	4.127	0.134
Managers communicate the goals and priorities of the organization.	272	3.530	0.221
Managers review and evaluate the organization's progress toward meeting its goals and objectives.	272	3.561	0.205
Empowerment			
I feel encouraged to come up with new and better ways of doing things.	272	3.647	0.214
Supervisors/team leaders in my work unit provide employees with the opportunities to demonstrate their leadership skills.	272	3.650	0.176
Employees have a feeling of personal empowerment with respect to work processes.	272	3.249	0.205
Creativity and innovation are rewarded.	272	3.226	0.237
How satisfied are you with your involvement in decisions that affect your work?	272	3.443	0.195
Communication			
Managers promote communication among different work units (for example, about projects, goals, needed resources).	272	3.442	0.206
How satisfied are you with the information you receive from management on what's going on in your organization?	272	3.293	0.230
Performance Evaluation			
In my work unit, differences in performance are recognized in a meaningful way.	272	3.022	0.187
My performance appraisal is a fair reflection of my performance.	272	3.635	0.185
Discussions with my supervisor/team leader about my performance are worthwhile.	272	3.509	0.159
In my most recent performance appraisal, I understood what I had to do to be rated at different performance levels (for example, Fully Successful, Outstanding).	272	3.617	0.193
How satisfied are you with the recognition you receive for doing a good job?	272	3.399	0.212
Meritocratic Principles			
Promotions in my work unit are based on merit.	272	3.113	0.216
In my work unit, steps are taken to deal with a poor performer who cannot or will not improve.	272	2.928	0.188
Employees are rewarded for providing high quality products and services to customers.	272	3.331	0.242
Pay raises depend on how well employees perform their jobs.	272	2.864	0.243
Awards in my work unit depend on how well employees perform their jobs.	272	3.231	0.218
Motivating Others			
In my organization, leaders generate high levels of motivation and commitment in the workforce.	272	3.113	0.264
Leader Performance			
I have trust and confidence in my supervisor.	272	3.736	0.177
I have a high level of respect for my organization's senior leaders.	272	3.359	0.273
Overall, how good a job do you feel is being done by your immediate supervisor/team leader?	272	3.869	0.171
Talent Utilization			
My talents are used well in the workplace.	272	3.538	0.164
Work Quality			
How would you rate the overall quality of work done by your work group?	272	4.250	0.127
I am held accountable for achieving results.	272	4.075	0.110

falling in the range from 1 to 5. The key distinguishing factor that makes the independent variables work as measures of leadership level perceptions of development is that in the averaging process to the sub-element level, only the individual level responses of those respondents who have identified themselves as having some sort of organizational leadership responsibility are included in the sample population. This means that each sub-element level variable response for each independent variable measures the average response of all employees in the sub-element who fall into the following leadership-level categories: team leader, supervisor, manager, executive. This distinction allows this study to test the relationship between the average perceptions of organizational sub-element leaders of their preparation through development for supervisory roles and the dependent variable measures of all sub-element employees' perceptions of organization-wide leader skills, competencies, and behaviors, as well as aspects of organization performance.

By limiting to leadership status the individual level sample population used in averaging the independent variable response items to the sub-element level, the individual-level sample size of leaders was reduced to 95,804, which represents approximately 44% of all respondents. An examination of the individual level data after reducing the sample population to those employees with leadership status reveals no notable abnormalities as compared to the full sample population data. All 272 sub-elements are represented. The median response frequency is 212 and 265 of 272 sub-elements have a response frequency of greater than 25. The descriptive statistics for each independent variable measure as averaged at the sub-element level are presented in Table 5.2.

Table 5.2 Independent Variables

Response Item	N	Mean	Std. Dev.
Leader Development Support			
Opportunity to Improve Skills	272	3.815	0.234
Leaders Suggest to Improve Performance	272	3.689	0.176
Leaders Support Employee Development	272	3.893	0.193
Training Needs Assessed.	272	3.414	0.261

Note Regarding Independent and Dependent Variable Populations

Questions may arise as to why the choice was not made to limit the dependent variables population to employees without leadership status rather than include the responses of those with leadership status. An argument can be made that including leaders' responses in the dependent variable measures can bias the results. The basic biasing effect could be that leaders are more inclined to respond positively to questions about leader skills, competencies, behaviors, or performance because they are leaders themselves and are less likely to be critical of a group they are associated with.

The decision to include leaders in the dependent variables population was made for two reasons. One, most leaders also have a supervisor of their own. A number of the questions referencing leadership specifically focus the inquiry on the responder's supervisor. Thus, the responder most likely associated his or her response with their perception of that particular leader and did not subject their response to bias as a result of their own leadership status.

Second, the exclusion of those employees with supervisory status would eliminate a large component of the population of responders that is subject to many of the same work environment dynamics and leadership influences as those without leadership status. To leave the leaders out would sacrifice a substantial chunk of valuable observations from this study. This study explores organizational effects. To eliminate the perceptions of large chunk of the organization from the

dependent variable measures means that the effects shown in the study could not be considered organization-wide.

That being said, the models were run with both sets of dependent variables populations to test to see if inclusion or exclusion of leaders mattered for the regression results. Although the results differed, as might be expected, the differences were not substantial enough to justify exclusion of leaders from the dependent variables population. Therefore, the variables in this study are constituted as laid out in the sections above.

Interaction Term

Using measures of personal opinions and perceptions from a survey as the basis of a statistical analysis of effects of one on the other can often be subject to the biases of the individual, which can distort both the statistical and practical validity of the analysis results. In such cases, the partial effect of the independent variable with respect to the dependent variable depends on the magnitude of another independent variable (Wooldridge 2006). Consequently, the data analysis must control for these interactions to isolate the effect of the independent variable of interest.

While this study uses measures that reflect the average perception or opinion of individuals in a sub-element, a quality that may serve to moderate potential extreme biasing effects of individual level perception measurement, it is still necessary to account for factors that may have a general biasing effect on the sub-element average response. In this study, it is likely that the average response levels of the four independent variable measures of leadership development are influenced by the average response levels of a measure of satisfaction with training. Therefore, a training satisfaction measure is included as both a control and in an interaction term with the development measure in each regression analyses in order to capture

any influence satisfaction has on the effect of the development measures with respect to the dependent variables.

This interaction variable prior to aggregation is measured on a five point ordinal scale and is coded from 1 to 5 with 1 representing the most negative response and 5 representing the most positive response. This measure is constructed in the same way as the independent variable measures of interest, by isolating the responses of those individuals in leadership positions and averaging those responses at the sub-element level. This captures only the average satisfaction with training by sub-element of those in leadership positions, a necessary distinction to match the sample population composing this variable to the sample population composing the independent variables of interest. The response item and response choices for the training satisfaction control variable measure are included in Appendix A. The descriptive statistics for the training satisfaction control variable measure as averaged at the sub-element level are presented with the other control variables in Table 5.3.

Control Variables

An argument can be made against the use of survey measures as an accurate and objective reflection of reality. Survey responses are inherently influenced by the respondent's background, experiences, and biases. For example, an employee who is generally unsatisfied with their work environment and experiences may bias all of their responses related to work negatively as a result, and vice-versa. Factors other than those that are personal could influence the respondent's perception of their workplace, such as their ability to competently perform the work tasks and the adequacy of resources in support of their work. Therefore, in order to reinforce the adequacy of the regression model and to guard against the presence of spurious relationships, a number of control measures are included in the regression analyses that follow.

All control variables prior to aggregation are measured on a five point ordinal scale and are coded from 1 to 5 with 1 representing the most negative response and 5 representing the most positive response. These measures are constructed in the same way as the dependent variable measures, by averaging the responses of all individuals in the sample population, those in leadership and non-leadership roles, at the sub-element level. In one instance a composite measure is developed by aggregating highly correlated similar response items. The process for generating this aggregate measure is explained in the next paragraph. The response items and response choices for all control variable measures are included in Appendix A. The descriptive statistics for all control variable measures as averaged at the sub-element level are presented in Table 5.3.

Table 5.3 Control Variables

Response Item	N	Mean	Std. Dev.
Leader – Training Satisfaction	272	3.555	0.248
Satisfaction Scale	272	-2.59e-09	2.070
Like Work	272	4.160	0.126
Work Important	272	4.326	0.120
Workforce Knowledge & Skills	272	3.818	0.181
Recruit Right Skills	272	3.339	0.254
Resources	272	3.222	0.283
Workload Reasonable	272	3.400	0.227
Hybrid	272	0.309	0.463
Non-Regulatory	272	0.404	0.492
Headquarters	237	0.450	0.278
Size	269	82183.74	81318.32
Professionalism	270	0.297	0.208
Supervisory Status	237	1.885	0.330
Hispanic	237	0.016	0.034
Caucasian	272	0.604	0.261
Age Group	237	3.384	0.234
Pay Category	237	3.451	0.347

Job Satisfaction

This study includes one composite control measure, job satisfaction. As described above, job satisfaction has a strong potential to bias other work-related survey responses. The survey measures making up this construct are highly correlated; therefore they are combined into a single measure to compensate for potential multicollinearity problems. Principal component analysis was used to create the composite measure, incorporating orthogonal varimax rotation with Kaiser normalization. The job satisfaction measures loaded strongly on the first component with an eigenvalue of 4.28; all other components had eigenvalues of less than 1. This component accounts for 85 percent of the total variance. The Cronbach's Alpha measure of scale reliability is 0.94. Scores for the component were saved as a new variable that measures *Job Satisfaction.*

Intrinsic Value of Work

Each regression model includes two control measures from the survey responses that gauge the intrinsic value employees hold for the work they perform. Certain types of work that produces outcomes translatable into positive feedback and work for organizations that corresponds strongly with employee values can influence perceptions of work environment. For example, if employees of the Environmental Protection Agency choose to work there because they value doing work to contribute to the preservation of the environment, they may have more positive impressions of their workplace. The converse can also be true. Theory and research shows that intrinsic valuing of work can enhance motivation and positive feelings toward the endeavor (Deci and Ryan 2002).

Capacity

The capacity to perform work tasks can have an effect on employees' perceptions of their workplace. If employees don't perceive that they themselves or their co-workers are adequately

skilled to successfully perform their job responsibilities, the consequence could be negative impressions of other aspect of the workplace, and vice-versa. The same may be true if employees do not perceive having adequate resources to perform their work or if they perceive that their workload is excessive. Therefore, four survey measures were included to control for the perception of the capacity to adequately perform work within the sub-elements.

Organizational Characteristics

The type of work conducted by the agency may have an effect on employee perceptions of their work environment. If the work involves some type of enforcement or restriction of action, such as the work of regulatory organizations, the responses of employees of those organizations may vary from those working in supportive or promotional roles, such as those providing social assistance. Therefore, following the example of Chun and Rainey (2005), a measure of organizational policy responsibility type (regulatory, non-regulatory, or hybrid) was created.

This variable was fashioned using a method similar to that employed by Chun and Rainey. First, agencies were classified as *regulatory* if they are included in the 2006 *Congressional Quarterly's Federal Regulatory Directory*, which includes any agency with regulatory responsibility. All other agencies were classified as non-regulatory. The second step involved reclassifying those agencies included in the Directory, but did not have a strongly regulatory mission, as hybrid. This was accomplished by searching the 2006 Performance and Accountability Reports of each agency for reference to regulatory function or mission priority. Performance and Accountability Reports are created yearly to satisfy a number of performance and budgetary reporting requirements. Lack of reference to this priority provides evidence that the agency does not consider regulation to be a primary function of the agency. Therefore, those

agencies with low regulatory priority were reclassified from regulatory to hybrid. These variables are not averaged as the others are, as it is already a measure of an organizational characteristic. Dummy variables indicating *Hybrid* and *Non-regulatory* status are included in the regression models, leaving out *Regulatory* status as the referent category.

Other organizational characteristics may have an effect on how an employee assesses his or her work environment. The physical location where the employee conducts his or her work can have an impact. Those employees working in the headquarters location are closer the origin of the agency's decisions and therefore may feel that their work is more relevant and valuable to the activities of the agency than those working in field locations. A dummy control variable *Location* is coded 1 if the respondent works at headquarters. This variable is aggregated (by averaging) up to the organization sub-element level. This provides a measure of the influence of headquarters responses versus field responses. Averages between 0.5 and 1 indicate a stronger influence of headquarters-based responses. Averages between 0 and 0.5 indicate a stronger influence of field-based responses.

A factor that could influence the adequacy of leader development is the size of the agency. Larger agencies are more likely to have the resources to develop and administer comprehensive development programs, in addition to the ability to buffer those programs against budget cuts. Therefore, the variable *Agency Size* is included in the regression models. It is comprised of the natural log of the number of full time employees working for each agency in 2008, the year the FHCS was administered. This data was collected from the CPDF.

Finally, another organizational factor that could potentially affect employee perceptions of their work environment is the level of professionalism within their organization. An organization with a greater proportion of professional employees may be more likely to have

leaders who are already well trained in leadership and management skills, either through agency development programs or through independent education (graduate education, management training and certification). These employees might be expected to perform more competently in their leadership roles than those from an organization with a less professionalized workforce, who may have been promoted to leadership roles by default of tenure, without adequate training in leadership and management skills. In this study, *Professionalism* is measured as the proportion of employees in professional positions to the entire agency population for full-time employees, as categorized and reported in the CPDF.

Employee Status Characteristics

This study also controls for two status characteristics that may influence responses to the survey items. *Supervisory Status* measures the hierarchical supervisory level of the respondent. This measure is self-reported by the respondent as part of the FHCS. A higher level of supervisory status corresponds with more organizational responsibility, which could correspond with a greater likelihood to report more favorably the actions of leaders than a respondent at a lower responsibility level might. Individual level responses are coded from 1 to 5 with increasing values corresponding to increasing responsibility. As with other individual-level measured variables, this measure is an aggregation (by averaging) to the organizational sub-element level. After aggregation, this measure indicates the average supervisory level of survey respondents for each agency sub-element.

Due to the structure of the compensation system and rules related to advancement in the federal government, level of pay, in addition to measuring respondent compensation level, can serve as an approximate measure of tenure of government service and also as another indicator of organizational responsibility. These factors could contribute to bias in employee responses as

a result of positive or negative emotional and psychological investment in their work and workplace. Therefore, the variable *Pay Category* was created. Individual level responses are coded from 1 to 5 with increasing values corresponding to increasing pay levels. As with other individual-level measured variables, this measure is an aggregation (by averaging) at the organizational sub-element level. After aggregation, this measure indicates the average pay level of survey respondents for each agency sub-element. Survey measures reporting agency tenure and federal government tenure results were excluded from this study due to excessive missing values.

Demographic Characteristics

Demographic characteristics of the respondents may play a role in influencing their responses to survey questions. Three demographic control variables are included in each regression model. *Caucasian* is a dummy variable indicating whether or not the respondent's race is Caucasian. *Hispanic* is a dummy variable indicating whether or not the respondent identifies with a Hispanic origin. *Age Group* places the respondent in a 10-year age range category, coded 1 to 5 with increasing values corresponding to age range increases. As with other individual-level measured variables, each measure is an aggregation (by averaging) at the organizational sub-element level. After aggregation, each measure indicates the average level of survey responses for each agency sub-element. A survey measures reporting the sex of the respondent was excluded from this study due to excessive missing values.

CHAPTER 6

ANALYSIS AND RESULTS

This chapter presents the results of the statistical analysis conducted to test the hypotheses developed in chapter 4. Ordinary least squares (OLS) regression is the multivariate regression technique chosen to conduct these tests. It is selected as a consequence of the data transformations described above. Aggregating the categorical responses to the survey questions to the organization sub-element level by averaging creates new measures that are continuous. While the relationship between organizational support for leadership development and the dependent variables may not be linear at this aggregate level, no research was found to suggest otherwise. In addition, plots of the data points did not indicate the presence of non-linear relationships. As such, under the assumptions of the Gauss-Markov Theorem, no estimators are better than OLS (Wooldridge 2006). Therefore OLS is the chosen method of estimation. These analysis results provide evidence to foster a greater understanding of the potential influence organizational support for leadership development can have on leader skills, competencies, and behaviors, as well as organization performance. The OLS regression results are presented with the corresponding regression models. The results are categorized by hypothesis.

The procedure for testing each hypothesis is as follows. Each hypothesis has one or more dependent variable measure(s) associated with it (see Appendix A). Each dependent variable is included in four separate regression models, each containing one of four independent variables measuring organizational support for leader development. These independent variable measures are listed in Appendix A. Below is a general model of the relationship between each dependent

variable measure and each independent variable measure. Specific models of each relationship are provided prior to each regression results table. All coefficients are reported as unstandardized; regressions were also executed to produce standardized coefficients, but resulted in almost no change.

General Model of Development Influence

$$O = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

O = Leader Skill, Competency, Behavior, or Organizational Performance Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Hypothesis 1: Goal-setting

The results of the OLS regression analyses of the dependent variable measures of Goal-setting are shown in the tables below. Also below is a model of the effect of leader development support on the goal-orientation of the organization's environment.

Model of Leader Development Support Influence on Goal-setting

$$Goal = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

$Goal$ = Goal-setting Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Results: *I know how my work relates to the agency's goals and priorities.*

The results for the regression analyses of this response item are not reported because none of the leader development support measures has a statistically significant relationship with the dependent variable.

Results: *Managers communicate the goals and priorities of the organization.*

Table 6.1 reports the results of the four regression analyses incorporating the response item: *Managers communicate the goals and priorities of the organization.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 231. The interaction term is significant in the first model, but problems with the statistical validity of this model (explained below) call its significance into question. The R-squared values across the four models range from 0.73 to 0.76 and the adjusted R-squared values across the models range from 0.70 to 0.73. This indicates that each model accounts for 70 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.00 and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The negative relationship in Model 1 was unexpected and not consistent with the findings of the other models. A visual inspection of the component-plus-residual plot of the regression

Table 6.1 OLS Regression Model: Managers communicate the goals and priorities of the organization.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures	*Invalid*			
Opp Improve Skills (1) - *Invalid*	-0.195**			
	(0.08)			
Superv Suggests Perf Improv (2)		0.385***		
		(0.07)		
Superv Supports Dev (3)			0.240***	
			(0.08)	
Training Needs Assessed (4)				0.287***
				(0.06)
Controls				
Leader Training Satis	0.092	-0.132***	-0.138**	-0.260***
	(0.07)	(0.05)	(0.06)	(0.07)
Interaction Term	0.284**			
	(0.14)			
Satisfaction Scale	0.096***	0.080***	0.085***	0.091***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.663***	-0.512***	-0.616***	-0.583***
	(0.11)	(0.10)	(0.11)	(0.10)
Work Important	0.211**	0.054	0.190*	0.148
	(0.10)	(0.10)	(0.10)	(0.10)
Recruit	0.133**	0.065	0.100	0.148**
	(0.06)	(0.06)	(0.06)	(0.06)
Resources	0.111**	0.136***	0.116**	0.134**
	(0.06)	(0.05)	(0.05)	(0.05)
Workload	-0.103	-0.099*	-0.063	-0.119*
	(0.06)	(0.06)	(0.06)	(0.06)
Headquarters	-0.069**	-0.070**	-0.083***	-0.037
	(0.03)	(0.03)	(0.03)	(0.03)
Caucasian	-0.071	-0.077	-0.116*	-0.096
	(0.07)	(0.06)	(0.07)	(0.06)
Hybrid	0.050***	0.045**	0.049***	0.023
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.075***	0.047**	0.063***	0.029
	(0.02)	(0.02)	(0.02)	(0.02)
Professional	-0.054	-0.057	-0.076*	-0.070*
	(0.04)	(0.04)	(0.04)	(0.04)
Constant	0.005	0.006	0.015	0.016*
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	231	231	231	231
R-squared	0.73	0.76	0.73	0.75
Adj. R-squared	0.70	0.73	0.70	0.72

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Workforce has Relevant Knowledge & Skills; Hispanic; Age Group; Pay Category; Supervisory Status; Agency Size

shows a distinct non-linearity in the relationship, violating the linearity assumption of OLS. Therefore, despite the statistical significance of this model, the OLS regression analysis results cannot be considered valid.

The regression analysis of this response item provides support for the Goal-setting hypothesis, as 3 of the 4 measures of leader development support have positive and significant relationships with this response item. Specifically, an average 1 level increase in positive response to each of the statistically significant development measures results in a range from a 0.240 to a 0.385 average increase in positive response level regarding the communication of goals by management, where all other variables are 0. These results provide evidence that support for leader development can have a modest positive effect on the readiness of managers to communicate organizational goals to employees.

Results: *Managers review and evaluate the organization's progress toward meeting its goals and objectives.*

Table 6.2 reports the results of the four regression analyses incorporating the response item: *Managers review and evaluate the organization's progress toward meeting its goals and objectives.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 232. The interaction term is not significant across the models and therefore is dropped from the regressions. The R-squared values across the four models range from 0.64 to 0.72 and the adjusted R-squared values across the models range from 0.61 to 0.69. This indicates that each model accounts for 61 percent or more of the variance in

Table 6.2 OLS Regression Model: Managers review and evaluate the organization's progress toward meeting its goals and objectives.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.122			
	(0.09)			
Superv Suggests Perf Improv (2)		0.522***		
		(0.07)		
Superv Supports Dev (3)			0.311***	
			(0.09)	
Training Needs Assessed (4)				0.374***
				(0.06)
Controls				
Leader Training Satis	0.061	-0.188***	-0.182***	-0.350***
	(0.08)	(0.05)	(0.07)	(0.07)
Satisfaction Scale	0.086***	0.068***	0.074***	0.078***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.489***	-0.286**	-0.432***	-0.397***
	(0.12)	(0.11)	(0.12)	(0.11)
Recruit	0.118*	0.031	0.076	0.175***
	(0.07)	(0.06)	(0.07)	(0.07)
Resources	0.167***	0.216***	0.185***	0.217***
	(0.06)	(0.05)	(0.06)	(0.06)
Workload	-0.152**	-0.196***	-0.146**	-0.225***
	(0.07)	(0.06)	(0.07)	(0.07)
Headquarters	-0.083**	-0.073**	-0.091***	-0.039
	(0.04)	(0.03)	(0.03)	(0.03)
Caucasian	-0.099	-0.096	-0.151**	-0.127*
	(0.07)	(0.07)	(0.07)	(0.07)
Pay Category	0.057**	0.031	0.022	0.042
	(0.03)	(0.03)	(0.03)	(0.03)
Hybrid	0.050**	0.035*	0.040*	0.004
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.056**	0.015	0.035	-0.004
	(0.02)	(0.02)	(0.02)	(0.02)
Professional	-0.119***	-0.116***	-0.136***	-0.107***
	(0.04)	(0.04)	(0.04)	(0.04)
Agency Size	-0.000	-0.000	-0.000	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.023**	0.014	0.025**	0.029***
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	232	232	232	232
R-squared	0.64	0.72	0.66	0.69
Adj. R-squared	0.61	0.69	0.63	0.67

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Work Important; Workforce has Relevant Knowledge & Skills; Hispanic; Age Group; Supervisory Status

employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.28 and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides support for the Goal-setting hypothesis, as 3 of the 4 measures of leader development support have positive and significant relationships with this response item. Specifically, an average 1 level increase in positive response to each of the statistically significant development measures results in a range from a 0.311 to a 0.522 average increase in positive response level regarding the evaluation by management of progress toward goals, where all other variables are 0. These results provide evidence that support for leader development can have a modest positive effect on the readiness of managers to evaluate progress toward organizational goals.

Hypothesis 2: Empowerment

The results of the OLS regression analyses of the dependent variable measures of Empowerment are shown in the tables below. Also below is a model of the effect of leader development support on the propensity for leaders to empower employees to take greater control over work functions and decisions.

Model of Leader Development Support Influence on Empowerment

$$Empower. = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

Empower. = Empowerment Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Results: *I feel encouraged to come up with new and better ways of doing things.*

Table 6.3 reports the results of the four regression analyses incorporating the response item: *I feel encouraged to come up with new and better ways of doing things.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 229. The interaction term is not significant across the models and therefore is dropped from the regressions. The R-squared values across the four models range from 0.80 to 0.82 and the adjusted R-squared values across the models range from 0.78 to 0.80. This indicates that each model accounts for 78 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.48 and the lowest tolerance value was 0.15, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan tests for heteroskedasticity are significant (although White tests are not)

Table 6.3 OLS Regression Model: I feel encouraged to come up with new and better ways of doing things.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.362***			
	(0.10)			
Superv Suggests Perf Improv (2)		-0.213***		
		(0.08)		
Superv Supports Dev (3)			-0.005	
			(0.09)	
Training Needs Assessed (4)				-0.072
				(0.05)
Controls				
Leader Training Satis	-0.065	0.238***	0.169***	0.231***
	(0.07)	(0.04)	(0.05)	(0.06)
Satisfaction Scale	0.079***	0.101***	0.095***	0.095***
	(0.01)	(0.01)	(0.01)	(0.01)
Work Important	-0.325***	-0.233**	-0.334***	-0.311***
	(0.10)	(0.11)	(0.10)	(0.10)
Resources	-0.130**	-0.179***	-0.155**	-0.165**
	(0.06)	(0.06)	(0.07)	(0.07)
Headquarters	0.091***	0.113***	0.112***	0.101***
	(0.03)	(0.03)	(0.03)	(0.03)
Hispanic	-0.299*	-0.369**	-0.414**	-0.418**
	(0.17)	(0.18)	(0.18)	(0.18)
Age Group	0.078***	0.077**	0.080**	0.073**
	(0.03)	(0.03)	(0.03)	(0.03)
Non-Regulatory	0.059***	0.091***	0.075***	0.086***
	(0.02)	(0.02)	(0.02)	(0.02)
Supervisory Status	0.045*	0.014	0.020	0.017
	(0.02)	(0.02)	(0.03)	(0.03)
Agency Size	0.000**	0.000*	0.000*	0.000**
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.003	0.006	0.005	0.003
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	229	229	229	229
R-squared	0.82	0.81	0.80	0.80
Adj. R-squared	0.80	0.79	0.78	0.78

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Like Work; Recruit People w/ Right Skills; Workforce has Relevant Knowledge & Skills; Workload Reasonable; Caucasian; Pay Category; Hybrid; Professional

indicating that heteroskedasticity may be a problem in all of the models. Heteroskedasticity robust standard errors using Huber-White sandwich estimators were calculated to compensate for heteroskedasticity. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides mixed results for the Empowerment hypothesis, as 2 of the 4 measures of leader development support have significant relationships with this response item, but opposing directions. Model 1 indicates that an average 1 level increase in positive response to the measure of leader perceived opportunity to improve skills results in a 0.362 average increase in positive response level regarding encouragement for all employees to innovate in their work, where all other variables are 0. This result provides evidence in support of the hypothesis that leader development can have a modest positive effect on the readiness of leaders to empower employees.

However, Model 2 provides evidence counter to the hypothesis, indicating that a negative relationship exists between the measure of encouragement for all employees to innovate in their work and the measure of leaders' perception that leaders provide employees constructive suggestions to improve their job performance. On its face, this result is the opposite of what the hypothesis predicts. There is a plausible explanation for the result. Psychology literature provides evidence that controlling behavior by superiors can temper employee perceptions of autonomy (Bandura 2001; Deci and Ryan 2002). Following this concept, the negative relationship could be a consequence of the leader providing suggestions, which are seen as expectations of behavior. These expectations act as constraints on behavior for the employee, reducing their autonomy to innovate in their own way. Taken as a credible explanation of this relationship, one can reconsider the evidence provided by Model 2 against the hypothesis. Providing suggestions for

improvement may be seen from a development standpoint as beneficial, but from an innovation standpoint as detrimental.

Results: *Supervisors/team leaders in my work unit provide employees with the opportunities to demonstrate their leadership skills.*

Table 6.4 reports the results of the four regression analyses incorporating the response item: *Supervisors/team leaders in my work unit provide employees with the opportunities to demonstrate their leadership skills.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 228. The interaction term is significant in two of the models and therefore is included in the regressions. The R-squared values across the four models range from 0.79 to 0.82 and the adjusted R-squared values across the models range from 0.77 to 0.80. This indicates that each model accounts for 77 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.03 and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted

Table 6.4 OLS Regression Model: Supervisors/team leaders in my work unit provide employees with the opportunities to demonstrate their leadership skills.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.282***			
	(0.06)			
Superv Suggests Perf Improv (2)		0.002		
		(0.05)		
Superv Supports Dev (3)			0.176***	
			(0.06)	
Training Needs Assessed (4)				-0.044
				(0.04)
Controls				
Leader Training Satis	-0.110**	0.066*	-0.028	0.115**
	(0.05)	(0.04)	(0.05)	(0.05)
Interaction Term	0.316***	0.206	0.246**	0.067
	(0.10)	(0.14)	(0.12)	(0.09)
Satisfaction Scale	0.040***	0.053***	0.049***	0.053***
	(0.01)	(0.01)	(0.01)	(0.01)
Work Important	-0.260***	-0.263***	-0.286***	-0.248***
	(0.07)	(0.08)	(0.08)	(0.08)
Recruit	0.107**	0.098**	0.084*	0.095**
	(0.04)	(0.05)	(0.05)	(0.05)
Headquarters	-0.049**	-0.038	-0.040*	-0.047*
	(0.02)	(0.02)	(0.02)	(0.02)
Caucasian	0.064	0.085*	0.053	0.087*
	(0.05)	(0.05)	(0.05)	(0.05)
Hispanic	-0.360**	-0.427***	-0.430***	-0.439***
	(0.15)	(0.16)	(0.16)	(0.16)
Pay Category	0.084***	0.097***	0.077***	0.099***
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.041***	0.055***	0.046***	0.062***
	(0.02)	(0.02)	(0.02)	(0.02)
Supervisory Status	0.119***	0.098***	0.099***	0.096***
	(0.02)	(0.02)	(0.02)	(0.02)
Agency Size	0.000*	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.019***	-0.011	-0.011	-0.011
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	228	228	228	228
R-squared	0.82	0.79	0.80	0.79
Adj. R-squared	0.80	0.77	0.78	0.77

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Like Work; Workforce has Relevant Knowledge & Skills; Resources to Get Job Done; Workload Reasonable; Age Group; Hybrid; Professional

against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides support for the Empowerment hypothesis, as 2 of the 4 measures of leader development support have significant and positive relationships with this response item. Model 1 indicates that an average 1 level increase in positive response to the measure of leader perceived opportunity to improve skills results in a 0.282 average increase in positive response level regarding leaders providing employees leadership opportunities, where all other variables are 0. The interaction term is also significant and indicates a positive relationship, showing that at levels of leader training satisfaction the slope of the regression of perception of leader initiated employee leadership opportunities on leader perception of opportunity to improve skills increases on average by 0.316 level for every 1 level average increase in training satisfaction.

Model 3 indicates that an average 1 level increase in positive response to the measure of leader perception of support for employee development results in a 0.176 average increase in positive response level regarding leaders providing employees leadership opportunities, where all other variables are 0. The interaction term is also significant and indicates a positive relationship, showing that at levels of leader training satisfaction the slope of the regression of perception of leader initiated employee leadership opportunities on leader perception of support for employee development increases on average by 0.246 level for every 1 level average increase in training satisfaction. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on the willingness of leaders to empower employees.

Results: *Employees have a feeling of personal empowerment with respect to work processes.*

The results for the regression analyses of this response item are not reported because none of the leader development support measures has a statistically significant relationship with the dependent variable.

Results: *Creativity and innovation are rewarded.*

Table 6.5 reports the results of the four regression analyses incorporating the response item: *Creativity and innovation are rewarded.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 229. The interaction term is not significant across the models and therefore is dropped from the regressions. The R-squared values across the four models range from 0.78 to 0.79 and the adjusted R-squared values across the models range from 0.76 to 0.77. This indicates that each model accounts for 76 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.53 and the lowest tolerance value was 0.15, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted

Table 6.5 OLS Regression Model: Creativity and innovation are rewarded.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.357***			
	(0.09)			
Superv Suggests Perf Improv (2)		-0.171**		
		(0.08)		
Superv Supports Dev (3)			0.186**	
			(0.09)	
Training Needs Assessed (4)				-0.167***
				(0.06)
Controls				
Leader Training Satis	-0.028	0.258***	0.098	0.347***
	(0.08)	(0.06)	(0.07)	(0.08)
Satisfaction Scale	0.076***	0.098***	0.087***	0.091***
	(0.01)	(0.01)	(0.01)	(0.01)
Work Important	-0.352***	-0.287**	-0.388***	-0.315***
	(0.11)	(0.12)	(0.11)	(0.11)
Knowledge and Skills	0.205**	0.179*	0.233**	0.185*
	(0.10)	(0.10)	(0.10)	(0.10)
Resources	-0.101	-0.153**	-0.125**	-0.154**
	(0.06)	(0.06)	(0.06)	(0.06)
Age Group	0.083**	0.083**	0.089**	0.069*
	(0.04)	(0.04)	(0.04)	(0.04)
Pay Category	0.078***	0.098***	0.073**	0.094***
	(0.03)	(0.03)	(0.03)	(0.03)
Non-Regulatory	0.008	0.040	0.017	0.053**
	(0.02)	(0.02)	(0.02)	(0.03)
Supervisory Status	0.095***	0.062**	0.067**	0.061**
	(0.03)	(0.03)	(0.03)	(0.03)
Agency Size	0.000**	0.000*	0.000**	0.000**
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.004	-0.000	0.002	-0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	229	229	229	229
R-squared	0.79	0.78	0.78	0.78
Adj. R-squared	0.77	0.76	0.76	0.76

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Like Work; Recruit People w/ Right Skills; Workload Reasonable; Headquarters; Caucasian; Hispanic; Hybrid; Professional

against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides mixed results for the Empowerment hypothesis, as 2 of the 4 measures of leader development support have significant and positive relationships with this response item and 2 of the 4 have significant and negative relationships. Model 1 indicates that an average 1 level increase in positive response to the measure of leader perceived opportunity to improve skills results in a 0.357 average increase in positive response level regarding rewards for creativity and innovation, where all other variables are 0. Model 3 indicates that an average 1 level increase in positive response to the measure of leader perception of support for employee development results in a 0.186 average increase in positive response level regarding rewards for creativity and innovation, where all other variables are 0. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on the willingness of leaders to empower employees.

However, Model 2 and 4 have significant and negative relationships with the creativity and innovation measure. On their face, these relationships provide evidence to reject the empowerment hypothesis. However, there are plausible explanations for the relationships in both models. The results from Model 2 for this response item could be indicating the same effect as Model 2 for the response item: *I feel encouraged to come up with new and better ways of doing things,* described above. Leader suggestions to improve job performance could be perceived by employees as constraints on creativity and innovation.

The results from Model 4 are more difficult to explain. The coefficient indicates that as leaders responses to the item regarding whether their training needs have been assessed become more positive, creativity and innovation is less likely to be reported as being rewarded. This

effect does not have the expected relationship, but if training satisfaction is taken into account, the negative effect of training needs assessment is altered. The training satisfaction measure has both a significant and positive relationship with the creativity and innovation measure. Comparing training needs assessment and training satisfaction coefficients, a 0.5 average level increase in training satisfaction mitigates the negative effect of a 1 average level increase in training needs assessment. This effect may be evidence that if leaders' training needs are assessed but the leaders are not satisfied with the training received, then dissatisfaction with training can result in negative leader behavior such as unwillingness to foster or reward creativity and innovation. Therefore, if one accepts these explanations for the negative relationships in Models 2 and 4, the relationships do not necessarily demand that the Empowerment hypothesis be rejected, based on the analysis of this response item.

Results: *How satisfied are you with your involvement in decisions that affect your work?*

Table 6.6 reports the results of the four regression analyses incorporating the response item: *How satisfied are you with your involvement in decisions that affect your work?* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 232. The interaction term is not significant in any of the models and therefore is dropped from the regressions. The R-squared values across the four models range from 0.89 to 0.90 and the adjusted R-squared values across the models range from 0.88 to 0.89. This indicates that each model accounts for 88 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level.

Table 6.6 OLS Regression Model: How satisfied are you with your involvement in decisions that affect your work?

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.171***			
	(0.05)			
Superv Suggests Perf Improv (2)		-0.000		
		(0.04)		
Superv Supports Dev (3)			0.046	
			(0.05)	
Training Needs Assessed (4)				0.045
				(0.03)
Controls				
Leader Training Satis	-0.085**	0.025	-0.001	-0.016
	(0.04)	(0.03)	(0.04)	(0.04)
Satisfaction Scale	0.092***	0.099***	0.098***	0.099***
	(0.01)	(0.00)	(0.00)	(0.00)
Like Work	-0.123**	-0.125**	-0.120*	-0.113*
	(0.06)	(0.06)	(0.06)	(0.06)
Work Important	-0.207***	-0.216***	-0.223***	-0.230***
	(0.06)	(0.06)	(0.06)	(0.06)
Caucasian	-0.084**	-0.079**	-0.088**	-0.084**
	(0.04)	(0.04)	(0.04)	(0.04)
Hispanic	-0.204*	-0.254**	-0.250**	-0.252**
	(0.12)	(0.12)	(0.12)	(0.12)
Non-Regulatory	0.024**	0.031**	0.028**	0.024*
	(0.01)	(0.01)	(0.01)	(0.01)
Supervisory Status	0.064***	0.053***	0.053***	0.054***
	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.001	0.002	0.003	0.003
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	232	232	232	232
R-squared	0.90	0.89	0.89	0.89
Adj. R-squared	0.89	0.88	0.88	0.88

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Workforce has Relevant Knowledge & Skills; Recruit People w/ Right Skills; Resources to Get Job Done; Workload Reasonable; Headquarters; Age Group; Pay Category; Hybrid; Professional; Agency Size

VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.44 and the lowest tolerance value was 0.15, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides limited support for the Empowerment hypothesis, as 1 of the 4 measures of leader development support have significant and positive relationships with this response item. The other models have no significant relationships. Model 1 indicates that an average 1 level increase in positive response to the measure of leader perceived opportunity to improve skills results in a 0.171 average increase in positive response level regarding average employee satisfaction with involvement in decisions that affect their work, where all other variables are 0. This result provides evidence in support of the hypothesis that leader development can have a modest positive effect on the willingness of leaders to empower employees.

Hypothesis 3: Communication

The results of the OLS regression analyses of the dependent variable measures of the ability of leaders to promote communication within an organization are shown in the tables below. Also below is a model of the effect of leader development support on the ability of leaders to promote communication.

Model of Leader Development Support Influence on Communication

$$Comm. = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

Comm. = Leader Communication Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Results: *Managers promote communication among different work units (for example, about projects, goals, needed resources).*

Table 6.7 reports the results of the four regression analyses incorporating the response item: *Managers promote communication among different work units (for example, about projects, goals, needed resources)*. Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 231. The interaction term is not significant in any of the models and therefore is excluded from the regressions. The R-squared values across the four models range from 0.81 to 0.83 and the adjusted R-squared values across the models range from 0.79 to 0.81. This indicates that each model accounts for 79 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.81 and the lowest tolerance value was 0.14, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all

Table 6.7 OLS Regression Model: Managers promote communication among different work units (for example, about projects, goals, needed resources).

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.054			
	(0.07)			
Superv Suggests Perf Improv (2)		0.086		
		(0.06)		
Superv Supports Dev (3)			0.164**	
			(0.06)	
Training Needs Assessed (4)				0.221***
				(0.04)
Controls				
Leader Training Satis	0.174***	0.181***	0.125**	0.012
	(0.06)	(0.04)	(0.05)	(0.05)
Satisfaction Scale	0.076***	0.075***	0.073***	0.078***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.274***	-0.242***	-0.245***	-0.208**
	(0.09)	(0.09)	(0.08)	(0.08)
Work Important	-0.120	-0.159*	-0.142*	-0.188**
	(0.08)	(0.08)	(0.08)	(0.08)
Workload	-0.071	-0.081	-0.071	-0.111**
	(0.05)	(0.05)	(0.05)	(0.05)
Pay Category	0.041**	0.039*	0.027	0.038*
	(0.02)	(0.02)	(0.02)	(0.02)
Hybrid	0.028*	0.025*	0.023	0.001
	(0.01)	(0.01)	(0.01)	(0.02)
Non-Regulatory	0.068***	0.064***	0.062***	0.036**
	(0.02)	(0.02)	(0.02)	(0.02)
Supervisory Status	0.105***	0.103***	0.101***	0.108***
	(0.02)	(0.02)	(0.02)	(0.02)
Agency Size	0.000**	0.000**	0.000**	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.002	0.001	0.004	0.006
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	231	231	231	231
R-squared	0.81	0.81	0.81	0.83
Adj. R-squared	0.79	0.79	0.79	0.81

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Workforce has Relevant Knowledge & Skills; Recruit People w/ Right Skills; Resources to Get Job Done; Headquarters; Caucasian; Hispanic; Age Group; Professional

of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides support for the Leadership Communication hypothesis, as 2 of the 4 measures of leader development support have significant and positive relationships with this response item. The other models have no significant relationships. Model 3 indicates that an average 1 level increase in positive response to the measure of leader perception of leader support for employee development results in a 0.164 average increase in positive response level regarding managers promoting work unit communication, where all other variables are 0. Model 4 indicates that an average 1 level increase in positive response to the measure of leader training needs assessment results in a 0.221 average increase in positive response level regarding managers promoting work unit communication, where all other variables are 0. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on leader ability to promote communication in the workplace.

Results: *How satisfied are you with the information you receive from management on what's going on in your organization?*

Table 6.8 reports the results of the four regression analyses incorporating the response item: *How satisfied are you with the information you receive from management on what's going on in your organization?* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A

Table 6.8 OLS Regression Model: How satisfied are you with the information you receive from management on what's going on in your organization?

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.025			
	(0.06)			
Superv Suggests Perf Improv (2)		0.203***		
		(0.05)		
Superv Supports Dev (3)			0.211***	
			(0.06)	
Training Needs Assessed (4)				0.092**
				(0.04)
Controls				
Leader Training Satis	0.134**	0.053	0.008	0.039
	(0.05)	(0.04)	(0.05)	(0.05)
Satisfaction Scale	0.100***	0.093***	0.093***	0.099***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.467***	-0.389***	-0.431***	-0.441***
	(0.08)	(0.08)	(0.08)	(0.08)
Work Important	-0.040	-0.128*	-0.065	-0.066
	(0.08)	(0.08)	(0.07)	(0.08)
Headquarters	-0.041*	-0.036	-0.043*	-0.027
	(0.02)	(0.02)	(0.02)	(0.02)
Caucasian	-0.093*	-0.090*	-0.121**	-0.099**
	(0.05)	(0.05)	(0.05)	(0.05)
Pay Category	0.038**	0.027	0.015	0.036*
	(0.02)	(0.02)	(0.02)	(0.02)
Hybrid	0.037**	0.029**	0.029**	0.026*
	(0.01)	(0.01)	(0.01)	(0.01)
Non-Regulatory	0.081***	0.064***	0.067***	0.067***
	(0.02)	(0.02)	(0.02)	(0.02)
Supervisory Status	0.037*	0.044**	0.040**	0.040**
	(0.02)	(0.02)	(0.02)	(0.02)
Professional	-0.083***	-0.074**	-0.085***	-0.084***
	(0.03)	(0.03)	(0.03)	(0.03)
Constant	0.014**	0.010	0.015**	0.015**
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	230	230	230	230
R-squared	0.84	0.85	0.85	0.84
Adj. R-squared	0.82	0.84	0.83	0.83

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Workforce has Relevant Knowledge & Skills; Recruit People w/ Right Skills; Resources to Get Job Done; Workload; Hispanic; Age Group; Agency Size

Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 230. The interaction term is not significant in any of the models and therefore is excluded from the regressions. The R-squared values across the four models range from 0.84 to 0.85 and the adjusted R-squared values across the models range from 0.82 to 0.84. This indicates that each model accounts for 82 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.35 and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides support for the Leadership Communication hypothesis, as 3 of the 4 measures of leader development support have significant and positive relationships with this response item. The other model does not have a significant relationship. Model 2 indicates that an average 1 level increase in positive response to the measure of leaders' perception that leaders provide employees constructive suggestions to improve their job performance results in a 0.203 average increase in positive response level regarding employee satisfaction with organizational information provided by leadership, where all other variables are 0. Model 3 indicates that an average 1 level increase in positive response

to the measure of leader perception of leader support for employee development results in a 0.211 average increase in positive response level regarding employee satisfaction with organizational information provided by leadership, where all other variables are 0. Model 4 indicates that an average 1 level increase in positive response to the measure of leader training needs assessment results in a 0.092 average increase in positive response level regarding employee satisfaction with organizational information provided by leadership, where all other variables are 0. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on leader willingness to communicate with employees regarding organization activities.

Hypothesis 4: Performance Evaluation

The results of the OLS regression analyses of the dependent variable measures of the evaluation of employee performance are shown in the tables below. Also below is a model of the effect of leader development support on the propensity for leaders to effectively evaluate employee performance. This hypothesis incorporates two additional control measures, for the purpose of accounting for the average level of value and comprehension employees perceive related to their performance evaluation interactions with their supervisor. The response items making up these controls are presented in Appendix A. These controls will also serve as dependent variables and will accordingly be excluded as controls from those regressions.

Model of Leader Development Support Influence on the Evaluation of Employee Performance

$$Perform. = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

Perform. = Performance Evaluation Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Results: *In my work unit, differences in performance are recognized in a meaningful way.*

Table 6.9 reports the results of the four regression analyses incorporating the response item: *In my work unit, differences in performance are recognized in a meaningful way*. Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 229. The interaction term is not significant in any of the models and therefore is dropped from the regressions. The R-squared values across the four models range from 0.82 to 0.83 and the adjusted R-squared value across the models is 0.81. This indicates that each model accounts for 81 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 7.65 and the lowest tolerance value was 0.13, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides support for the Performance Evaluation hypothesis, as 2 of the 4 measures of leader development support have significant and positive relationship with this response item. The other models have no significant relationships.

Table 6.9 OLS Regression Model: In my work unit, differences in performance are recognized in a meaningful way.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.132**			
	(0.06)			
Superv Suggests Perf Improv (2)		-0.009		
		(0.05)		
Superv Supports Dev (3)			0.130**	
			(0.06)	
Training Needs Assessed (4)				0.016
				(0.05)
Controls				
Performance Discussions Worthwhile	0.735***	0.728***	0.699***	0.729***
	(0.08)	(0.08)	(0.08)	(0.08)
Understand Performance Levels	-0.088*	-0.094**	-0.080*	-0.098**
	(0.05)	(0.05)	(0.05)	(0.05)
Leader Training Satis	0.022	0.111***	0.039	0.093*
	(0.05)	(0.04)	(0.05)	(0.06)
Satisfaction Scale	0.019**	0.026***	0.023***	0.026***
	(0.01)	(0.01)	(0.01)	(0.01)
Knowledge and Skills	0.109	0.108	0.137*	0.109
	(0.07)	(0.07)	(0.07)	(0.07)
Resources	0.076*	0.063	0.074*	0.066
	(0.04)	(0.04)	(0.04)	(0.04)
Workload	-0.091*	-0.095*	-0.098**	-0.097*
	(0.05)	(0.05)	(0.05)	(0.05)
Caucasian	-0.109**	-0.102**	-0.120**	-0.104**
	(0.05)	(0.05)	(0.05)	(0.05)
Pay Category	0.064***	0.069***	0.056***	0.068***
	(0.02)	(0.02)	(0.02)	(0.02)
Hybrid	0.039***	0.041***	0.035**	0.039**
	(0.01)	(0.01)	(0.01)	(0.02)
Non-Regulatory	0.047***	0.053***	0.044***	0.050***
	(0.02)	(0.02)	(0.02)	(0.02)
Supervisory Status	0.128***	0.119***	0.120***	0.120***
	(0.02)	(0.02)	(0.02)	(0.02)
Professional	-0.083***	-0.071**	-0.071**	-0.070**
	(0.03)	(0.03)	(0.03)	(0.03)
Constant	0.009	0.010	0.010	0.010
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	229	229	229	229
R-squared	0.83	0.82	0.83	0.82
Adj. R-squared	0.81	0.81	0.81	0.81

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Like Work; Work Important; Recruit People w/ Right Skills; Headquarters; Hispanic; Age Group; Agency Size

Model 1 indicates that an average 1 level increase in positive response to the measure of leader perceived opportunity to improve skills results in a 0.132 average increase in positive response level regarding average employee level of agreement performance differences are recognized in a meaningful way, where all other variables are 0. Model 3 indicates that an average 1 level increase in positive response to the measure of leader perceived support by leadership for employee development results in a 0.130 average increase in positive response level regarding average employee level of agreement performance differences are recognized in a meaningful way, where all other variables are 0. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on the evaluation of employee performance by leadership.

Results: *My performance appraisal is a fair reflection of my performance.*

Table 6.10 reports the results of the four regression analyses incorporating the response item: *My performance appraisal is a fair reflection of my performance.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 229. The interaction term is weakly significant in Model 4 and therefore is included in the regressions. The R-squared values across the four models range from 0.60 to 0.62 and the adjusted R-squared values across the models range from 0.56 to 0.58. This indicates that each model accounts for 56 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.32

Table 6.10 OLS Regression Model: My performance appraisal is a fair reflection of my performance.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.051			
	(0.09)			
Superv Suggests Perf Improv (2)		0.173**		
		(0.08)		
Superv Supports Dev (3)			0.011	
			(0.09)	
Training Needs Assessed (4)				0.202***
				(0.06)
Controls				
Interaction Term	0.179	0.245	0.171	0.223*
	(0.16)	(0.19)	(0.17)	(0.13)
Satisfaction Scale	0.056***	0.051***	0.055***	0.057***
	(0.01)	(0.01)	(0.01)	(0.01)
Knowledge and Skills	0.235**	0.247**	0.228**	0.252**
	(0.11)	(0.10)	(0.11)	(0.10)
Resources	-0.119*	-0.092	-0.115*	-0.092
	(0.06)	(0.06)	(0.06)	(0.06)
Headquarters	0.113***	0.115***	0.108***	0.147***
	(0.04)	(0.03)	(0.03)	(0.04)
Caucasian	-0.137*	-0.144**	-0.139*	-0.165**
	(0.07)	(0.07)	(0.07)	(0.07)
Pay Category	0.074**	0.063**	0.071**	0.063**
	(0.03)	(0.03)	(0.03)	(0.03)
Hybrid	-0.029	-0.037*	-0.030	-0.059***
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	-0.011	-0.027	-0.012	-0.052**
	(0.02)	(0.02)	(0.02)	(0.03)
Agency Size	0.000*	0.000*	0.000*	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.011	-0.012	-0.010	-0.009
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	229	229	229	229
R-squared	0.60	0.61	0.60	0.62
Adj. R-squared	0.56	0.57	0.56	0.58

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Training Satisfaction; Like Work; Work Important; Recruit People w/ Right Skills; Workload; Hispanic; Age Group; Supervisory Status; Professional

and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides support for the Performance Evaluation hypothesis, as 2 of the 4 measures of leader development support have significant and positive relationships with this response item. The other models have no significant relationships. Model 2 indicates that an average 1 level increase in positive response to the measure of leaders' perception that leaders provide employees constructive suggestions to improve their job performance results in a 0.173 average increase in positive response level regarding average employee level of agreement that performance appraisals are fair, where all other variables are 0. Model 4 indicates that an average 1 level increase in positive response to the measure of leader training needs assessment results in a 0.202 average increase in positive response level regarding average employee level of agreement that performance appraisals are fair, where all other variables are 0. The interaction term in Model 4 is weakly significant and indicates a positive relationship, showing that at levels of leader training satisfaction the slope of the regression of fairness of performance appraisal on leader perception of training needs assessment increases on average by 0.223 level for every 1 level average increase in training satisfaction. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on the evaluation of employee performance by leadership.

Results: *Discussions with my supervisor/team leader about my performance are worthwhile.*

The results for the regression analyses of this response item are not reported because none of the leader development support measures has a statistically significant relationship with the dependent variable.

Results: *In my most recent performance appraisal, I understood what I had to do to be rated at different performance levels (for example, Fully Successful, Outstanding).*

Table 6.11 reports the results of the four regression analyses incorporating the response item: *In my most recent performance appraisal, I understood what I had to do to be rated at different performance levels (for example, Fully Successful, Outstanding)*. Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 230. The interaction term is not significant in any of the models and therefore is excluded from the regressions. The R-squared values across the four models range from 0.65 to 0.67 and the adjusted R-squared values across the models range from 0.62 to 0.64. This indicates that each model accounts for 62 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.70 and the lowest tolerance value was 0.15, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a

Table 6.11 OLS Regression Model: In my most recent performance appraisal, I understood what I had to do to be rated at different performance levels (for example, Fully Successful, Outstanding).

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.130			
	(0.09)			
Superv Suggests Perf Improv (2)		0.066		
		(0.08)		
Superv Supports Dev (3)			-0.102	
			(0.09)	
Training Needs Assessed (4)				0.221***
				(0.07)
Controls				
Performance Discussions Worthwhile	1.126***	1.125***	1.149***	1.121***
	(0.09)	(0.09)	(0.09)	(0.08)
Leader Training Satis	0.034	-0.067	0.009	-0.237***
	(0.08)	(0.06)	(0.07)	(0.08)
Satisfaction Scale	-0.026**	-0.032***	-0.030***	-0.030***
	(0.01)	(0.01)	(0.01)	(0.01)
Work Important	0.411***	0.388***	0.433***	0.364***
	(0.12)	(0.12)	(0.12)	(0.11)
Workload	0.171**	0.173**	0.183***	0.138**
	(0.07)	(0.07)	(0.07)	(0.07)
Non-Regulatory	-0.019	-0.029	-0.019	-0.060**
	(0.02)	(0.02)	(0.02)	(0.03)
Constant	0.008	0.006	0.006	0.010
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	230	230	230	230
R-squared	0.65	0.65	0.65	0.67
Adj. R-squared	0.62	0.62	0.62	0.64

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Like Work; Workforce has Relevant Knowledge & Skills; Recruit People w/ Right Skills; Resources to Get Job Done; Headquarters; Caucasian; Hispanic; Age Group; Pay Category; Hybrid; Supervisory Status; Professional; Agency Size

problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides limited support for the Performance Evaluation hypothesis, as 1 of the 4 measures of leader development support has a significant and positive relationship with this response item. The other models have no significant relationships. Model 4 indicates that an average 1 level increase in positive response to the measure of leader training needs assessment results in a 0.221 average increase in positive response level regarding average employee level of agreement that they understood what needed to be done to achieve performance rating levels, where all other variables are 0. This result provides evidence in support of the hypothesis that leader development can have a modest positive effect on the evaluation of employee performance by leadership.

Results: *How satisfied are you with the recognition you receive for doing a good job?*

The results for the regression analyses of this response item are not reported because none of the leader development support measures has a statistically significant relationship with the dependent variable.

Hypothesis 5: Meritocratic Principles

The results of the OLS regression analyses of the dependent variable measures of the exercise of Meritocratic Principles are shown in the tables below. Also below is a model of the effect of leader development support on the propensity for leaders to adhere to meritocratic principles when dealing with employees.

Model of Leader Development Support Influence on the Exercise of Meritocratic Principles

$$Merit. = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

Merit. = Meritocratic Principles Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Results: *Promotions in my work unit are based on merit.*

Table 6.12 reports the results of the four regression analyses incorporating the response item: *Promotions in my work unit are based on merit.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 229. The interaction term is not significant in any of the models and therefore is dropped from the regressions. The R-squared value across the four models is 0.73 and the adjusted R-squared value across the models is 0.71. This indicates that each model accounts for 71 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 7.44 and the lowest tolerance value was 0.13, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that

Table 6.12 OLS Regression Model: Promotions in my work unit are based on merit.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.188*			
	(0.10)			
Superv Suggests Perf Improv (2)		0.133*		
		(0.08)		
Superv Supports Dev (3)			0.111	
			(0.09)	
Training Needs Assessed (4)				0.033
				(0.06)
Controls				
Satisfaction Scale	0.052***	0.058***	0.059***	0.062***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.250**	-0.206*	-0.237**	-0.244**
	(0.11)	(0.11)	(0.11)	(0.11)
Knowledge and Skills	0.200**	0.199**	0.212**	0.196**
	(0.10)	(0.10)	(0.10)	(0.10)
Recruit	0.121*	0.101	0.108	0.126*
	(0.06)	(0.07)	(0.07)	(0.07)
Workload	-0.210***	-0.224***	-0.210***	-0.216***
	(0.07)	(0.07)	(0.07)	(0.07)
Headquarters	0.040	0.055*	0.050	0.055
	(0.03)	(0.03)	(0.03)	(0.03)
Age Group	-0.065*	-0.067*	-0.066*	-0.063*
	(0.04)	(0.04)	(0.04)	(0.04)
Pay Category	0.108***	0.108***	0.102***	0.112***
	(0.03)	(0.03)	(0.03)	(0.03)
Hybrid	0.089***	0.087***	0.088***	0.088***
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.075***	0.074***	0.077***	0.079***
	(0.02)	(0.02)	(0.02)	(0.02)
Supervisory Status	0.135***	0.123***	0.120***	0.121***
	(0.03)	(0.03)	(0.03)	(0.03)
Professional	0.097**	0.115***	0.109***	0.110***
	(0.04)	(0.04)	(0.04)	(0.04)
Constant	-0.015	-0.016	-0.013	-0.013
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	229	229	229	229
R-squared	0.73	0.73	0.73	0.73
Adj. R-squared	0.71	0.71	0.71	0.71

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Job Training Satisfaction; Work Important; Resources to Get Job Done; Workload Reasonable; Caucasian; Hispanic; Agency Size

heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides limited support for the Meritocratic Principles hypothesis, as 2 of the 4 measures of leader development support have weakly significant and positive relationships with this response item. The other models have no significant relationships. Model 1 indicates that an average 1 level increase in positive response to the measure of leader perceived opportunity to improve skills results in a 0.188 average increase in positive response level regarding average employee level of agreement that promotions are based on merit, where all other variables are 0. Model 2 indicates that an average 1 level increase in positive response to the measure of leaders' perception that leaders provide employees constructive suggestions to improve their job performance results in a 0.133 average increase in positive response level regarding average employee level of agreement that promotions are based on merit, where all other variables are 0. These results provide evidence, although weak, in support of the hypothesis that leader development can have a modest positive effect on the adherence to meritocratic principles by leaders.

Results: *In my work unit, steps are taken to deal with a poor performer who cannot or will not improve.*

Table 6.13 reports the results of the four regression analyses incorporating the response item: *In my work unit, steps are taken to deal with a poor performer who cannot or will not improve.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs

Table 6.13 OLS Regression Model: In my work unit, steps are taken to deal with a poor performer who cannot or will not improve.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.100			
	(0.10)			
Superv Suggests Perf Improv (2)		0.398***		
		(0.08)		
Superv Supports Dev (3)			0.316***	
			(0.09)	
Training Needs Assessed (4)				0.083
				(0.07)
Controls				
Satisfaction Scale	0.027**	0.011	0.014	0.025***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.244**	-0.103	-0.201*	-0.171
	(0.12)	(0.12)	(0.12)	(0.12)
Work Important	0.341***	0.187	0.317***	0.294**
	(0.12)	(0.11)	(0.11)	(0.11)
Knowledge and Skills	0.130	0.150	0.194*	0.024
	(0.11)	(0.10)	(0.11)	(0.11)
Recruit	0.139*	0.065	0.088	0.190***
	(0.07)	(0.07)	(0.07)	(0.07)
Resources	0.261***	0.305***	0.281***	0.300***
	(0.06)	(0.06)	(0.06)	(0.06)
Workload	-0.313***	-0.350***	-0.313***	-0.332***
	(0.07)	(0.07)	(0.07)	(0.07)
Headquarters	-0.071*	-0.057*	-0.071**	-0.063*
	(0.04)	(0.03)	(0.03)	(0.04)
Caucasian	-0.138*	-0.132*	-0.185**	-0.150**
	(0.08)	(0.07)	(0.08)	(0.07)
Age Group	-0.057	-0.067*	-0.064*	-0.051
	(0.04)	(0.04)	(0.04)	(0.04)
Pay Category	0.061**	0.044	0.029	0.062**
	(0.03)	(0.03)	(0.03)	(0.03)
Hybrid	0.072***	0.057***	0.060***	0.059***
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.125***	0.093***	0.105***	0.117***
	(0.02)	(0.02)	(0.02)	(0.03)
Supervisory Status	0.170***	0.182***	0.174***	0.196***
	(0.03)	(0.03)	(0.03)	(0.03)
Constant	-0.003	-0.009	-0.001	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	230	230	230	230
R-squared	0.65	0.68	0.66	0.67
Adj. R-squared	0.61	0.66	0.63	0.63

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Job Training Satisfaction; Hispanic; Professional; Agency Size

test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 230. The interaction term is not significant in any of the models and therefore is dropped from the regressions. The R-squared values across the four models range from 0.65 to 0.68 and the adjusted R-squared values across the models range from 0.61 to 0.66. This indicates that each model accounts for 61 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.69 and the lowest tolerance value was 0.15, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides limited support for the Meritocratic Principles hypothesis, as 2 of the 4 measures of leader development support have significant and positive relationships with this response item. The other models have no significant relationships. Model 2 indicates that an average 1 level increase in positive response to the measure of leaders' perception that leaders provide employees constructive suggestions to improve their job performance results in a 0.398 average increase in positive response level regarding the perception that persistent poor performers are dealt with accordingly, where all other variables are 0. Model 3 indicates that an average 1 level increase in positive response to

the measure of leader perceived support by leadership for employee development results in a 0.316 average increase in positive response level regarding the perception that persistent poor performers are dealt with accordingly, where all other variables are 0. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on the adherence to meritocratic principles by leaders.

Results: *Employees are rewarded for providing high quality products and services to customers.*

Table 6.14 reports the results of the four regression analyses incorporating the response item: *Employees are rewarded for providing high quality products and services to customers.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 231. The interaction term is not significant in any of the models and therefore is dropped from the regressions. The R-squared value across the four models is 0.76 and the adjusted R-squared value across the models is 0.74. This indicates that each model accounts for 74 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.64 and the lowest tolerance value was 0.15, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem.

Table 6.14 OLS Regression Model: Employees are rewarded for providing high quality products and services to customers.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.176*			
	(0.09)			
Superv Suggests Perf Improv (2)		-0.015		
		(0.08)		
Superv Supports Dev (3)			0.112	
			(0.09)	
Training Needs Assessed (4)				-0.012
				(0.07)
Controls				
Leader Training Satis	0.112	0.231***	0.164**	0.236***
	(0.08)	(0.06)	(0.07)	(0.08)
Satisfaction Scale	0.090***	0.098***	0.094***	0.097***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.300**	-0.301**	-0.275**	-0.300**
	(0.12)	(0.13)	(0.12)	(0.12)
Work Important	-0.263**	-0.258**	-0.277**	-0.261**
	(0.12)	(0.12)	(0.12)	(0.12)
Knowledge and Skills	0.165	0.165	0.187*	0.165
	(0.11)	(0.11)	(0.11)	(0.11)
Age Group	0.067*	0.067*	0.067*	0.066*
	(0.04)	(0.04)	(0.04)	(0.04)
Pay Category	0.121***	0.127***	0.115***	0.127***
	(0.03)	(0.03)	(0.03)	(0.03)
Supervisory Status	0.095***	0.082***	0.084***	0.082***
	(0.03)	(0.03)	(0.03)	(0.03)
Constant	0.000	0.001	0.002	0.001
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	231	231	231	231
R-squared	0.76	0.76	0.76	0.76
Adj. R-squared	0.74	0.74	0.74	0.74

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Recruit People w/ Right Skills; Resources to Get Job Done; Workload Reasonable; Headquarters; Caucasian; Hispanic; Hybrid Agency, Non-Regulatory Agency; Professional; Agency Size

Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides limited support for the Meritocratic Principles hypothesis, as 1 of the 4 measures of leader development support has a weakly significant and positive relationship with this response item. The other models have no significant relationships. Model 1 indicates that an average 1 level increase in positive response to the measure of leader perceived opportunity to improve skills results in a 0.176 average increase in positive response level regarding average employee level of agreement that employees are rewarded for providing high quality products and services, where all other variables are 0. This result provides evidence in support of the hypothesis that leader development can have a modest positive effect on the adherence to meritocratic principles by leaders.

Results: *Pay raises depend on how well employees perform their jobs.*

The results for the regression analyses of this response item are not reported because none of the leader development support measures has a statistically significant relationship with the dependent variable.

Results: *Awards in my work unit depend on how well employees perform their jobs.*

The results for the regression analyses of this response item are not reported because none of the leader development support measures has a statistically significant relationship with the dependent variable.

Hypothesis 6: Motivating Others

The results of the OLS regression analyses of the dependent variable measures of Motivating Others are shown in the tables below. Also below is a model of the effect of leader development support on the ability of leaders to motivate the organization's workforce.

Model of Leader Development Support Influence on Motivating Others

$$Motiv. = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

Motiv. = Motivation Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Results: *In my organization, leaders generate high levels of motivation and commitment in the workforce.*

Table 6.15 reports the results of the four regression analyses incorporating the response item: *In my organization, leaders generate high levels of motivation and commitment in the workforce.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but an outlier may be present. A Grubbs test confirmed the presence of this outlier and it was dropped from the population, reducing the number of sub-elements to 235. The interaction term is significant across the models and therefore is included in the regressions. The R-squared values across the four models range from 0.86 to 0.87 and the adjusted R-squared values across the models range from 0.85 to 0.86. This indicates that each model accounts for 85 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four

Table 6.15 OLS Regression Model: In my organization, leaders generate high levels of motivation and commitment in the workforce.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.150**			
	(0.07)			
Superv Suggests Perf Improv (2)		0.010		
		(0.06)		
Superv Supports Dev (3)			-0.038	
			(0.07)	
Training Needs Assessed (4)				0.143***
				(0.05)
Controls				
Leader Training Satis	0.065	-0.039	-0.017	-0.161**
	(0.06)	(0.05)	(0.06)	(0.06)
Interaction Term	0.267**	0.288*	0.274**	0.228**
	(0.12)	(0.15)	(0.13)	(0.10)
Satisfaction Scale	0.117***	0.111***	0.113***	0.112***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.433***	-0.414***	-0.435***	-0.386***
	(0.09)	(0.10)	(0.09)	(0.09)
Headquarters	0.081***	0.072**	0.071**	0.096***
	(0.03)	(0.03)	(0.03)	(0.03)
Caucasian	-0.173***	-0.173***	-0.169***	-0.192***
	(0.06)	(0.06)	(0.06)	(0.06)
Hybrid	0.042**	0.041**	0.041**	0.021
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.121***	0.117***	0.118***	0.089***
	(0.02)	(0.02)	(0.02)	(0.02)
Supervisory Status	0.035	0.042*	0.043*	0.046*
	(0.03)	(0.03)	(0.03)	(0.02)
Agency Size	0.000***	0.000***	0.000***	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.005	0.006	0.005	0.007
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	235	235	235	235
R-squared	0.87	0.86	0.86	0.87
Adj. R-squared	0.85	0.85	0.85	0.86

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Work Important; Workforce has Relevant Knowledge & Skills; Recruit People w/ Right Skills; Have Resources to get Job Done; Workload Reasonable; Hispanic; Age Group, Pay Category; Professional

models, the highest VIF value was 6.71 and the lowest tolerance value was 0.15, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides mixed results for the Motivating Others hypothesis, as 2 of the 4 measures of leader development support have no significant relationships with this response item and coefficients that are not practically different from 0. In Model 1 the measure of development support has a significant and negative relationship with the motivating others measure. However, the interaction term is significant and shows that at levels of leader training satisfaction the slope of the regression of level of perception of high leader generated motivation and commitment on perception of opportunity to improve skills increases on average by 0.267 level for every 1 level average increase in training satisfaction. In other words, at any levels of perception of opportunity to improve skills, any increase in average level of leader satisfaction with training reduces the negative effect of that perception. Another potential explanation for this negative relationship may be the wording of the survey question. The response item asks the respondent if "leaders generate *high* (italics mine) levels of motivation and commitment." The qualifier *high* may have persuaded respondents to respond more negatively than they would have if it were not included.

Model 4 provides mixed evidence relative to the hypothesized relationship. The relationship between the perception on average of leaders in each sub-element that their training

needs are assessed and the perception on average of all employees in the same sub-element that leaders generate high levels of motivation and commitment is positive and significant. Specifically, an average 1 level increase in positive response to the leader training need assessment measure results in a 0.15 average increase in positive response level regarding the generation of high levels of motivation and commitment by leaders, where all other variables are 0. This would seem to provide evidence in favor of the hypothesis. However, the training satisfaction control measure is statistically significant and has an almost equal negative effect on average response level regarding the generation of high levels of motivation and commitment by leaders. This indicates that an increase in satisfaction with training received counters the positive effect training needs assessment has on the motivation measure. This effect contradicts what is expected and therefore draws the positive effect of the independent variable in this model into question. Taking into account the results of the statistical analysis of the relationship of leader development to the fostering of motivation in the workforce by leaders, one can conclude that this study provides little, if any, evidence to support the hypothesis.

Hypothesis 7: Leader Performance

The results of the OLS regression analyses of the dependent variable measures of the evaluation of leader performance are shown in the tables below. Also below is a model of the effect of leader development support on the performance of organization leaders.

Model of Leader Development Support Influence on Leader Performance

$$L.\ Perform. = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

$L.\ Perform.$ = Leader Performance Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Results: *I have trust and confidence in my supervisor.*

Table 6.16 reports the results of the four regression analyses incorporating the response item: *I have trust and confidence in my supervisor*. Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 231. The interaction term is not significant in any of the models and therefore is excluded from the regressions. The R-squared values across the four models range from 0.80 to 0.81 and the adjusted R-squared values across the models range from 0.79 to 0.80. This indicates that each model accounts for 79 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.16 and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides support for the Leadership Performance hypothesis, as 2 of the 4 measures of leader development support have significant and positive relationships with this response item. The other models have no significant

Table 6.16 OLS Regression Model: I have trust and confidence in my supervisor.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.084			
	(0.06)			
Superv Suggests Perf Improv (2)		0.121***		
		(0.05)		
Superv Supports Dev (3)			0.167***	
			(0.05)	
Training Needs Assessed (4)				0.009
				(0.04)
Controls				
Leader Training Satis	-0.060	-0.048	-0.096**	-0.016
	(0.05)	(0.03)	(0.04)	(0.05)
Satisfaction Scale	0.059***	0.059***	0.058***	0.062***
	(0.01)	(0.01)	(0.01)	(0.01)
Recruit	0.139***	0.118***	0.115***	0.138***
	(0.04)	(0.04)	(0.04)	(0.04)
Workload	-0.066	-0.089**	-0.076*	-0.075*
	(0.04)	(0.04)	(0.04)	(0.04)
Caucasian	0.113**	0.111**	0.085*	0.115**
	(0.04)	(0.04)	(0.04)	(0.04)
Pay Category	0.035**	0.032*	0.021	0.037**
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.033**	0.026*	0.025*	0.033**
	(0.01)	(0.01)	(0.01)	(0.02)
Professional	0.048*	0.059**	0.051**	0.056**
	(0.03)	(0.03)	(0.03)	(0.03)
Constant	-0.012**	-0.013**	-0.009	-0.011*
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	231	231	231	231
R-squared	0.81	0.81	0.81	0.80
Adj. R-squared	0.79	0.79	0.80	0.79

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Like Work; Work Important; Workforce has Relevant Knowledge & Skills; Resources to Get Job Done; Headquarters; Hispanic; Age Group; Hybrid; Supervisory Status; Agency Size

relationships. Model 2 indicates that an average 1 level increase in positive response to the measure of leaders' perception that leaders provide employees constructive suggestions to improve their job performance results in a 0.121 average increase in positive response level regarding trust and confidence in supervisors, where all other variables are 0. Model 3 indicates that an average 1 level increase in positive response to the measure of leader perception of leader support for employee development results in a 0.167 average increase in positive response level regarding trust and confidence in supervisors, where all other variables are 0. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on leader performance.

Results: *I have a high level of respect for my organization's senior leaders.*

Table 6.17 reports the results of the four regression analyses incorporating the response item: *I have a high level of respect for my organization's senior leaders.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 231. The interaction term is significant in all four models and therefore is included in the regressions. The R-squared value across the four models is 0.83 and the adjusted R-squared value across the models ranges from 0.81 to 0.82. This indicates that each model accounts for 81 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 5.93 and the

Table 6.17 OLS Regression Model: I have a high level of respect for my organization's senior leaders.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.244***			
	(0.09)			
Superv Suggests Perf Improv (2)		-0.073		
		(0.07)		
Superv Supports Dev (3)			-0.210**	
			(0.09)	
Training Needs Assessed (4)				0.174***
				(0.06)
Controls				
Leader Training Satis	0.009	-0.131**	-0.048	-0.303***
	(0.07)	(0.06)	(0.06)	(0.07)
Interaction Term	0.333**	0.422**	0.418**	0.306**
	(0.15)	(0.20)	(0.18)	(0.13)
Satisfaction Scale	0.126***	0.120***	0.123***	0.118***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.639***	-0.667***	-0.688***	-0.601***
	(0.11)	(0.12)	(0.11)	(0.11)
Work Important	0.165	0.211*	0.198*	0.129
	(0.11)	(0.11)	(0.11)	(0.11)
Knowledge and Skills	0.253**	0.255**	0.209**	0.261***
	(0.10)	(0.10)	(0.10)	(0.10)
Headquarters	0.077**	0.060*	0.060*	0.093***
	(0.03)	(0.03)	(0.03)	(0.03)
Caucasian	-0.296***	-0.310***	-0.284***	-0.323***
	(0.07)	(0.07)	(0.07)	(0.07)
Hispanic	0.666***	0.791***	0.724***	0.747***
	(0.23)	(0.23)	(0.23)	(0.22)
Hybrid	0.065***	0.066***	0.069***	0.039*
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.151***	0.150***	0.155***	0.107***
	(0.02)	(0.02)	(0.02)	(0.02)
Agency Size	0.000***	0.000***	0.000***	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.008	0.011	0.006	0.010
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	231	231	231	231
R-squared	0.83	0.83	0.83	0.83
Adj. R-squared	0.82	0.81	0.81	0.82

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Recruit People w/ Right Skills; Resources to Get Job Done; Workload; Age Group; Pay Category; Supervisory Status; Professional

lowest tolerance value was 0.17, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item mixed results for the Leadership Performance hypothesis, as 3 of the 4 measures of leader development support have significant relationships with this response item. However, two of the three relationships are negative. The other model has no significant relationship. Model 1 indicates that an average 1 level increase in positive response to the measure of leader perceived opportunity to improve skills results in a 0.244 average decrease in positive response level regarding employee respect for the organization's senior leaders, where all other variables are 0. The interaction term in Model 1 is significant and indicates a positive relationship, showing that at levels of leader training satisfaction the slope of the regression of employee respect for the organization's senior leaders on leader perceived opportunity to improve skills increases on average by 0.333 level for every 1 level average increase in training satisfaction.

Model 3 indicates that an average 1 level increase in positive response to the measure of leader perception of leader support for employee development results in a 0.210 average decrease in positive response level regarding employee respect for the organization's senior leaders, where all other variables are 0. The interaction term in Model 3 is significant and indicates a positive relationship, showing that at levels of leader training satisfaction the slope of

the regression of employee respect for the organization's senior leaders on leader perception of leader support for employee development increases on average by 0.418 level for every 1 level average increase in training satisfaction.

Model 4 indicates that an average 1 level increase in positive response to the measure of leader training needs assessment results in a 0.174 average increase in positive response level regarding employee respect for the organization's senior leaders, where all other variables are 0. The interaction term in Model 4 is significant and indicates a positive relationship, showing that at levels of leader training satisfaction the slope of the regression of employee respect for the organization's senior leaders on leader training needs assessment increases on average by 0.306 level for every 1 level average increase in training satisfaction.

Model 4 provides evidence in support of the hypothesis that leader development can have a modest positive effect on leader performance. While the results for Models 1 and 3 are unexpected and do not support the hypothesis, there are some plausible explanations for the negative relationship. First, the question specifically refers to senior leaders. Most employees may not have any personal contact with senior leaders and therefore view them as impersonal entities to which they tie all of their general disappointments with the organization. In addition, the purpose of this study was to investigate the general effect of development for *all* employees in leadership position on various environmental and performance outcomes. Therefore, the reference to senior leadership may have created a focus and disconnect for the question response that resulted in the nonsensical negative relationship. In addition, the interaction effect indicates that the relationship is strongly satisfaction driven and that increases in leader satisfaction with training can, at certain levels of the independent variables in Models 1 and 3, change the relationship to a positive one.

Results: *Overall, how good a job do you feel is being done by your immediate supervisor/team leader?*

Table 6.18 reports the results of the four regression analyses incorporating the response item: *Overall, how good a job do you feel is being done by your immediate supervisor/team leader?* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 230. The interaction term is not significant in any of the models and therefore is excluded from the regressions. The R-squared values across the four models range from 0.77 to 0.79 and the adjusted R-squared values across the models range from 0.75 to 0.78. This indicates that each model accounts for 75 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.00 and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

Table 6.18 OLS Regression Model: Overall, how good a job do you feel is being done by your immediate supervisor/team leader?

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.053			
	(0.06)			
Superv Suggests Perf Improv (2)		0.215***		
		(0.04)		
Superv Supports Dev (3)			0.165***	
			(0.05)	
Training Needs Assessed (4)				0.038
				(0.04)
Controls				
Satisfaction Scale	0.052***	0.045***	0.046***	0.050***
	(0.01)	(0.01)	(0.01)	(0.01)
Like Work	-0.204***	-0.146**	-0.185***	-0.197***
	(0.07)	(0.07)	(0.07)	(0.07)
Resources	0.083**	0.106***	0.091**	0.089**
	(0.04)	(0.03)	(0.04)	(0.04)
Workload	-0.042	-0.066*	-0.040	-0.046
	(0.04)	(0.04)	(0.04)	(0.04)
Caucasian	0.109**	0.095**	0.076*	0.103**
	(0.04)	(0.04)	(0.04)	(0.04)
Pay Category	0.060***	0.049***	0.042**	0.058***
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.027*	0.009	0.015	0.019
	(0.01)	(0.01)	(0.01)	(0.02)
Supervisory Status	0.027	0.036**	0.031*	0.031*
	(0.02)	(0.02)	(0.02)	(0.02)
Agency Size	-0.000**	-0.000**	-0.000**	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.006	-0.009	-0.005	-0.006
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	230	230	230	230
R-squared	0.77	0.79	0.78	0.77
Adj. R-squared	0.75	0.78	0.76	0.75

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Training Satisfaction; Work Important; Workforce has Relevant Knowledge & Skills; Recruit People w/ Right Skills; Headquarters; Hispanic; Age Group; Hybrid; Professional

The regression analysis of this response item provides support for the Leadership Performance hypothesis, as 2 of the 4 measures of leader development support have significant and positive relationships with this response item. The other models have no significant relationships. Model 2 indicates that an average 1 level increase in positive response to the measure of leaders' perception that leaders provide employees constructive suggestions to improve their job performance results in a 0.215 average increase in positive response level regarding how good a job immediate supervisors/team leaders are doing, where all other variables are 0. Model 3 indicates that an average 1 level increase in positive response to the measure of leader perception of leader support for employee development results in a 0.165 average increase in positive response level regarding how good a job immediate supervisors/team leaders are doing, where all other variables are 0.

These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on leader performance. However, these results may need to be taken with caution. The independent variable response items in Models 2 and 3 refer explicitly to supervisors/team leaders, as does the dependent variable. The independent variables in Models 1 and 4, which are not significant, do not. This could be an indicator that the matching specificity of reference in the independent variables in Models 2 and 3 and the dependent variable is causing a response bias in the results. However, given that the dependent variable is the 9th question on the survey and the independent variables are the 48th and 49th questions on the survey, the separation of the dependent and independent variable questions could mitigate the response bias.

Hypothesis 8: Talent Utilization

The results of the OLS regression analyses of the dependent variable measures of the ability of leaders to utilize talent effectively within an organization are shown in the tables

below. Also below is a model of the effect of leader development support on the ability of leaders to utilize talent effectively.

Model of Leader Development Support Influence on Talent Utilization

$$Talent = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

$Talent$ = Talent Utilization Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Results: *My talents are used well in the workplace.*

Table 6.19 reports the results of the four regression analyses incorporating the response item: *My talents are used well in the workplace.* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 232. The interaction term is not significant in any of the models and therefore is excluded from the regressions. The R-squared values across the four models range from 0.87 to 0.88 and the adjusted R-squared values across the models range from 0.86 to 0.87. This indicates that each model accounts for 86 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.11 and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the

Table 6.19 OLS Regression Model: My talents are used well in the workplace.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	0.123**			
	(0.05)			
Superv Suggests Perf Improv (2)		0.064		
		(0.04)		
Superv Supports Dev (3)			0.044	
			(0.05)	
Training Needs Assessed (4)				0.113***
				(0.03)
Controls				
Leader Training Satis	-0.062	-0.006	-0.010	-0.091**
	(0.04)	(0.03)	(0.04)	(0.04)
Satisfaction Scale	0.047***	0.051***	0.051***	0.052***
	(0.01)	(0.01)	(0.01)	(0.00)
Like Work	0.232***	0.250***	0.234***	0.255***
	(0.06)	(0.06)	(0.06)	(0.06)
Resources	0.051	0.055	0.052	0.068*
	(0.03)	(0.04)	(0.04)	(0.04)
Caucasian	-0.098**	-0.095**	-0.100**	-0.100***
	(0.04)	(0.04)	(0.04)	(0.04)
Age Group	0.039*	0.043**	0.043**	0.055***
	(0.02)	(0.02)	(0.02)	(0.02)
Pay Category	-0.046***	-0.045***	-0.047***	-0.045***
	(0.02)	(0.01)	(0.01)	(0.01)
Non-Regulatory	0.032**	0.031**	0.033**	0.017
	(0.01)	(0.01)	(0.01)	(0.01)
Supervisory Status	0.061***	0.055***	0.054***	0.059***
	(0.01)	(0.01)	(0.01)	(0.01)
Agency Size	0.000*	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.012**	0.012**	0.014**	0.015***
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	232	232	232	232
R-squared	0.88	0.87	0.87	0.88
Adj. R-squared	0.86	0.86	0.86	0.87

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Work Important; Workforce has Relevant Knowledge & Skills; Recruit People w/ Right Skills; Workload; Headquarters; Hispanic; Hybrid; Professional

models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan tests for heteroskedasticity are significant (although White tests are not) indicating that heteroskedasticity may be a problem in Models 1, 2, and 3. Heteroskedasticity robust standard errors using Huber-White sandwich estimators were calculated to compensate for heteroskedasticity in these models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides support for the Talent Utilization hypothesis, as 2 of the 4 measures of leader development support have significant and positive relationships with this response item. The other models do not have significant relationships. Model 1 indicates that an average 1 level increase in positive response to the measure of leader perceived opportunity to improve skills results in a 0.123 average increase in positive response level regarding employee perception of how well their talents are used, where all other variables are 0. Model 4 indicates that an average 1 level increase in positive response to the measure of leader training needs assessment results in a 0.113 average increase in positive response level regarding employee perception of how well their talents are used, where all other variables are 0. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on the utilization of employee talents.

Hypothesis 9: Work Quality

The results of the OLS regression analyses of the dependent variable measures of the ability of leaders to foster high quality work within an organization are shown in the tables below. Also below is a model of the effect of leader development support on the ability of leaders to foster high quality work.

Model of Leader Development Support Influence on Work Quality

$$Work\ Quality = \beta_0 + \beta_1 D + \beta_2 S + \beta_3 D * S + \beta_i X_i + \varepsilon$$

Work Quality = Work Quality Outcome Measure
D = Leader Development Support Measure
S = Leader Training Satisfaction Measure
X_i = Vector of Control Variable Measures

Results: *How would you rate the overall quality of work done by your work group?*

Table 6.20 reports the results of the four regression analyses incorporating the response item: *How would you rate the overall quality of work done by your work group?* Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 231. The interaction term is not significant in any of the models and therefore is excluded from the regressions. The R-squared values across the four models range from 0.73 to 0.74 and the adjusted R-squared values across the models range from 0.70 to 0.72. This indicates that each model accounts for 70 percent or more of the variance in employee responses to this question. F-test statistics show that each model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 5.96 and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a

Table 6.20 OLS Regression Model: How would you rate the overall quality of work done by your work group?

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.058			
	(0.05)			
Superv Suggests Perf Improv (2)		0.043		
		(0.04)		
Superv Supports Dev (3)			0.140***	
			(0.04)	
Training Needs Assessed (4)				-0.010
				(0.03)
Controls				
Satisfaction Scale	0.024***	0.020***	0.018***	0.021***
	(0.01)	(0.00)	(0.00)	(0.00)
Knowledge and Skills	0.181***	0.183***	0.208***	0.179***
	(0.05)	(0.05)	(0.05)	(0.05)
Resources	-0.071**	-0.065**	-0.062**	-0.071**
	(0.03)	(0.03)	(0.03)	(0.03)
Workload	0.086**	0.086**	0.089***	0.093***
	(0.03)	(0.03)	(0.03)	(0.04)
Headquarters	0.061***	0.058***	0.056***	0.056***
	(0.02)	(0.02)	(0.02)	(0.02)
Caucasian	0.192***	0.187***	0.164***	0.189***
	(0.04)	(0.04)	(0.04)	(0.04)
Hispanic	-0.333***	-0.324***	-0.303**	-0.315***
	(0.12)	(0.12)	(0.12)	(0.12)
Pay Category	0.083***	0.079***	0.067***	0.081***
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory	0.030**	0.025**	0.020*	0.029**
	(0.01)	(0.01)	(0.01)	(0.01)
Agency Size	-0.000**	-0.000*	-0.000	-0.000*
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-0.019***	-0.020***	-0.018***	-0.020***
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	231	231	231	231
R-squared	0.73	0.73	0.74	0.73
Adj. R-squared	0.71	0.70	0.72	0.70

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Training Satisfaction; Like Work; Work Important; Recruit People w/ Right Skills; Age Group; Hybrid; Supervisory Status; Professional

problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides limited support for the Work Quality hypothesis, as 1 of the 4 measures of leader development support has a significant and positive relationship with this response item. The other models do not have significant relationships. Model 3 indicates that an average 1 level increase in positive response to the measure of leader perception of leader support for employee development results in a 0.140 average increase in positive response level regarding employee assessment of quality of work done by the work group, where all other variables are 0. This result provides weak evidence in support of the hypothesis that leader development can have a modest positive effect on the quality of supervisee work.

Results: *I am held accountable for achieving results.*

Table 6.21 reports the results of the four regression analyses incorporating the response item: *I am held accountable for achieving results*. Missing values in the control variables caused the number of agency sub-elements included in the regression to fall from 272 to 237. A visual examination of a plot of the data points indicates that the distribution is close to normal, but outliers may be present. A Grubbs test confirmed the presence of these outliers and they were dropped from the population, reducing the number of sub-elements to 229. The interaction term is significant in 2 of the 4 models and therefore is included in the regressions. The R-squared values across the four models range from 0.62 to 0.65 and the adjusted R-squared values across the models range from 0.59 to 0.61. This indicates that each model accounts for 59 percent or more of the variance in employee responses to this question. F-test statistics show that each

Table 6.21 OLS Regression Model: I am held accountable for achieving results.

	UNSTANDARDIZED COEFFICIENTS			
VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)
Leader Development Measures				
Opp Improve Skills (1)	-0.065			
	(0.05)			
Superv Suggests Perf Improv (2)		0.181***		
		(0.04)		
Superv Supports Dev (3)			0.091*	
			(0.05)	
Training Needs Assessed (4)				0.119***
				(0.03)
Controls				
Leader Training Satis	0.111***	0.016	0.026	-0.040
	(0.04)	(0.03)	(0.04)	(0.04)
Interaction Term	0.193**	0.053	0.087	0.157**
	(0.08)	(0.10)	(0.10)	(0.07)
Work Important	0.264***	0.175***	0.247***	0.231***
	(0.06)	(0.06)	(0.06)	(0.06)
Knowledge and Skills	0.115**	0.110**	0.119**	0.119**
	(0.06)	(0.05)	(0.06)	(0.06)
Recruit	0.068*	0.036	0.056	0.069*
	(0.04)	(0.04)	(0.04)	(0.04)
Resources	0.130***	0.146***	0.134***	0.151***
	(0.03)	(0.03)	(0.03)	(0.03)
Workload	-0.151***	-0.157***	-0.142***	-0.165***
	(0.04)	(0.04)	(0.04)	(0.04)
Caucasian	-0.094**	-0.093**	-0.109***	-0.104***
	(0.04)	(0.04)	(0.04)	(0.04)
Age Group	0.044**	0.031	0.036*	0.057***
	(0.02)	(0.02)	(0.02)	(0.02)
Average Pay Category	0.055***	0.049***	0.047***	0.051***
	(0.02)	(0.02)	(0.02)	(0.02)
Non-Regulatory Agency	0.025**	0.015	0.022*	0.002
	(0.01)	(0.01)	(0.01)	(0.01)
Supervisory Status	0.051***	0.053***	0.051***	0.056***
	(0.02)	(0.02)	(0.02)	(0.02)
Constant	-0.003	-0.001	0.001	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	229	229	229	229
R-squared	0.62	0.65	0.62	0.64
Adj. R-squared	0.59	0.61	0.58	0.61

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10 (two-tailed tests)

Excluded from results presentation due to lack of statistical significance across models: Satisfaction Scale; Like Work; Headquarters; Hispanic; Hybrid; Professional; Agency Size

model is statistically significant at the ($p < 0.001$) level. VIF and tolerance tests were run to test for multicollinearity in each model. Across the four models, the highest VIF value was 6.02 and the lowest tolerance value was 0.16, indicating that multicollinearity is not likely a problem. The potential for multicollinearity problems was further tested by examining correlations between the model variables, the size of the standard errors, and by dropping variables from the models, all of which indicated that multicollinearity is not a problem. Breusch-Pagan and White tests indicate that heteroskedasticity is not a problem in any of the models. Regression residuals were plotted against the predicted values to visually check for extreme outliers in the regression errors; none were found.

The regression analysis of this response item provides support for the Work Quality hypothesis, as 3 of the 4 measures of leader development support has a significant and positive relationship with this response item. The other models do not have significant relationships. Model 2 indicates that an average 1 level increase in positive response to the measure of leaders' perception that leaders provide employees constructive suggestions to improve their job performance results in a 0.181 average increase in positive response level regarding employee agreement that he/she is accountable for achieving results, where all other variables are 0. Model 3 indicates that an average 1 level increase in positive response to the measure of leader perception of leader support for employee development results in a 0.091 average increase in positive response level regarding employee agreement that he/she is accountable for achieving results, where all other variables are 0.

Model 4 indicates that an average 1 level increase in positive response to the measure of leader training needs assessment results in a 0.119 average increase in positive response level regarding employee agreement that he/she is accountable for achieving results, where all other

variables are 0. The interaction term in Model 4 is significant and indicates a positive relationship, showing that at levels of leader training satisfaction the slope of the regression of employee agreement that he/she is accountable for achieving results on leader training needs assessment increases on average by 0.157 level for every 1 level average increase in training satisfaction. These results provide evidence in support of the hypothesis that leader development can have a modest positive effect on the expectation of quality in supervisee work.

Summary of Results

To summarize, the *Goal Setting* hypothesis receives statistical support across three of the four measures of development for two of the three measures of goal setting orientation. The *Motivating Others* hypothesis receives little, if any, statistical support across all of the measures of development for a single measure of motivation enhancement. The *Empowerment* hypothesis receives weak statistical support across two or fewer measures of development for five measures of work process empowerment, with the opportunity to demonstrate leadership skills showing the strongest relationship across measures of development. The *Meritocratic Principles* hypothesis received statistical support across two or fewer of the measures of development for three of five measures of meritocratic decision-making. The *Performance Evaluation* hypothesis received statistical support across two or fewer of the measures of development for three of five measures of performance evaluation quality. The *Leadership Performance* hypothesis received statistical support across two or fewer of the measures of development for two of three measures of leader performance quality and mixed results for the other measure. The *Communication* hypothesis received statistical support across three or fewer of the measures of development for both of the communication fostering measures. The *Talent Utilization* hypothesis received statistical support across two of the measures of development for the single measure of talent

utilization. The *Work Quality* hypothesis received statistical support across three or fewer of the measures of development for both of the work quality evaluation measures. This summary of results is also presented in Table 6.22.

Table 6.22 Summary of Results for Hypotheses

Dependent Variables	Independent Variables			
	Improve Skills	Constructive Suggestions	Support Development	Training Assessed
H1: Goal Setting				
Know how work relates to goals and priorities.				
Managers communicate goals		Sig; Pos	Sig; Pos	Sig; Pos
Managers review and evaluate progress toward goals		Sig; Pos	Sig; Pos	Sig; Pos
H2: Empowerment				
Encouraged to come up with new and better ways of doing things.	Sig; Pos	Sig; *Neg*		
Leaders provide employees opportunities to demonstrate leadership skills	Sig; Pos†		Sig; Pos†	
Employees have empowerment with respect to work processes.				
Creativity and innovation are rewarded	Sig; Pos	Sig; *Neg*	Sig; Pos	Sig; *Neg*
Satisfaction with involvement in decisions that affect work	Sig; Pos			
H3: Communication				
Managers promote communication among different work units			Sig; Pos	Sig; Pos
Satisfaction with information received from management on organization affairs		Sig; Pos	Sig; Pos	Sig; Pos
H4: Performance Evaluation				
Performance differences recognized in meaningful way	Sig; Pos		Sig; Pos	
Performance appraisal is fair		Sig; Pos		Sig; Pos†
Discussions with leader about performance worthwhile				
Understood what to do to be rated at different performance levels				Sig; Pos
Satisfaction with recognition received for good job				
H5: Meritocratic Principles				
Promotions based on merit	Sig; Pos	Sig; Pos		
Steps taken to deal with a poor performer		Sig; Pos	Sig; Pos	
Employees rewarded for providing high quality products and services	Sig; Pos			
Pay raises depend on job performance				
Awards depend on job performance				
H6: Motivating Others				
Leaders generate high levels of motivation and commitment	Sig; *Neg*†			Sig; Pos†
H7: Leader Performance				
Trust and confidence in supervisor		Sig; Pos	Sig; Pos	
High level of respect for senior leaders	Sig; *Neg*†		Sig; *Neg*†	Sig; Pos†
Overall, how good a job do you feel is being done by your immediate leader		Sig; Pos	Sig; Pos	
H8: Talent Utilization				
Talents are used well in the workplace	Sig; Pos			Sig; Pos
H9: Work Quality				
Rate overall quality of work group work			Sig; Pos	
Held accountable for achieving results		Sig; Pos	Sig; Pos	Sig; Pos†

† = Interaction Term Significant and Positive

CHAPTER 7

DISCUSSION

Analysis Results

The theoretical model developed in this study proposes that generalized organizational support for leadership development positively affects a variety of leader skills, competencies, and behaviors, as well as measures of organizational performance at a general organizational level given well-developed and readily available opportunities for education. This model is based on evidence both from prior research and from theory developed across a number of fields of study. Empirical testing in this study, as summarized in Table 6.22, provides overall support for the general proposition of the model. Two hypotheses have broad evidence of support across multiple measures; four hypotheses have moderate evidence of support across multiple measures; and three hypotheses have limited, if any, evidentiary support.

More specifically, of those hypotheses receiving broad support (Hypotheses 1 and 3), tests of Hypothesis 1 investigating the effects of measures of leadership development support on measures of leader goal setting behavior. It finds support in evidence of significant and positive relationships across the same three of four development support measures for two goal setting measures referring specifically to manager behavior. These results provide evidence that, across a variety of subjective measures of organizational support for leadership development, support has a positive effect organization-wide on leader behavior related to goal communication and progress assessment. A number of sources emphasize the value of the effective setting of goals as it relates to effective leadership (Rainey 2003; Whetten and Cameron 2007; Yukl 2006) as well as performance (Locke and Latham 2002). The third measure relating work to goals and

priorities shows no statistically significant effects. This result could be a consequence of the complexity and ambiguity often associated with organizational goals (Chun and Rainey 2005; Rainey 2003). Leaders across organizations may have a hard time relating the work done by individuals to organizational goals due to excessive complexity and ambiguity. Or, this result may indicate that leaders need enhanced development in this area.

The other hypothesis receiving broad support is Hypothesis 3, which tests the effects of measures of organizational support for leadership development on organization-wide measures of leader-influenced communication. Two of four measures of leadership development support have a significant and positive relationship with one of the measures of communication and three of four measures of support have significant and positive relationships with the other. These results provide evidentiary support that, across a variety of subjective organizational support for leadership development measures, support has a positive effect organization-wide on satisfaction with organization affairs information received from leaders and on leader promotion of inter-unit communication. Skill in both fostering and engaging in effective communication within the workplace is important to effective leadership, as established by Whetten and Cameron (2007) and Yukl (2006).

The analysis results show moderate support for four hypotheses, Hypotheses 4, 5, 8, and 9. Hypothesis 4 results provide evidence for significant and positive relationships in three of five measures of performance evaluation. Of those three, two have significant and positive relationships across only two measures of leadership development support and the third measure of performance evaluation has a significant and positive relationship with one measure of leadership development support. These results indicate that across a limited number of measures of organizational support for leadership development, support has an organization-wide positive

effect on the meaningful recognition of performance differences, the fairness of the appraisal process, and understanding of performance level ratings. This evidence provides moderate support for the influence of organizational support of leadership development on the process of performance evaluation. However, the lack of significant results for two of the measures seems to indicate that support for leadership development does not affect the value that employees overall derive from performance evaluation. Again, both Whetten and Cameron (2007) and Yukl (2006) list adeptness at performance evaluation as a competency of effective leaders.

Hypothesis 5 results indicate significant and positive relationships in three of five measures of meritocratic principles. Two of these three measures have significant and positive relationships across two measures of leadership development support, while the third measure of meritocratic principles has a significant and positive relationship with one measure of leadership development support. These results imply that across a limited number of measures of organizational support for leadership development, support has an organization-wide positive effect on perceptions that promotions are based on merit, poor performers are addressed, and employees are rewarded for high-quality work output. Based on these findings, the hypothesis is moderately supported through these measures of meritocratic action. As described above, in the public sector environment, a higher expectation exists that leader actions adhere to meritocratic principles, due to both historical and policy standards.

The lack of significant results for the meritocratic principles hypothesis related to measures of job performance rewards and pay raises may be a consequence of difficulties associated with pay for performance in a public sector compensation system. Berman et al. (2010, 214) list five preconditions for merit pay to be effective – "trust in management, a valid job evaluation system, clear performance factors, meaningful and consistent funding, and

accurate performance appraisal." If some or all of preconditions break down or are not present, then the link between job performance and rewards are lost. Thus, in such a situation, leadership is not able to effectively implement pay for performance, whether or not they have received development in this area. These results are consistent with previous research showing that merit pay in the public sector has had implementation difficulties (Kellough and Lu 1993).

The last two hypotheses moderately supported by the results of the analysis focus on performance. Hypothesis 8 incorporates a single measure of organization-wide talent utilization, which is significantly and positively related to two of four measures of organizational leadership development support. These results provide some evidence that organizational support for leadership development has a positive effect on employee perception of the utilization of their talents organization-wide. This outcome sustains the idea that support for leadership development can have some effect on employee performance as a consequence of the influence of the supported leadership.

Hypothesis 9 employs two measures of work quality, with the measure rating the overall quality of work group work organization-wide having a significant and positive relationship with one measure of organizational support for leadership development. The other measure, focusing on organization-wide accountability for achieving results, has a significant and positive relationship with three measures of support for leadership development. Therefore, the results indicate support for the hypothesis that organizational support for leadership development has a positive effect on work quality measures. In this case, the evidence is stronger for accountability monitoring rather than group work quality, likely because leaders have direct control over accountability assessment but much less control over group work quality. This outcome also

provides support, though weak, for the expectation that support for leadership development positively influences employee performance through enhanced leadership capacity.

Three hypotheses receive weak or no support from the analysis of the data. The results show very weak support for Hypothesis 2, empowerment. The key measure focusing on work process empowerment has no significant relationships. Two measures related to creativity and innovation have equally mixed significant positive and negative relationships with various measures of organizational support for leadership development, which are difficult to explain and essentially negate the measures' effects. The last two measures both have significant and positive relationships with measures of leadership development support, but with only two support measures in one case and one in the other. Therefore, conservatively, evidence for a positive relationship between organizational support for leadership development and organization-wide employee empowerment is very weak over most measures, except in the case of opportunities to demonstrate leadership skills. This result is disappointing, as employee empowerment is considered an important behavior of effective leaders (Whetten and Cameron 2007, Yukl 2006). However, as Rainey (2003) points out, constraints placed on the autonomy and power of civil servants, in addition to accountability demands, may act against the disposition to empower employees, negating any pass-through effect of organizational support for leadership development.

Hypothesis 6 proposes a positive relationship between organizational support for leadership development and organization-wide leader ability to motivate others. A single measure gauges motivation and it has a statistically significant relationship with two measures of leadership development support. However, one relationship is positive and one is negative. These results make it difficult to justify support for the hypothesis. There are a number of

possible explanations for this result. The most straightforward is that motivation fostering is not an easily developable skill, assuming that valid and effective programs for the development of motivation fostering skills exist. Another explanation is that motivation is an intangible psychological and emotional construct with levels of measurement unique to each individual. Consequently, patterns of influence are not consistent across individuals. A third possible explanation is that levels of motivation and commitment are not constant and change based on any number of environmental, psychological, and emotional conditions. Therefore, levels measured at a moment in time as with a survey may not accurately reflect the average levels experienced over time.

The final hypothesis with weak or no statistical support, Hypothesis 7, tests the relationship between organizational support for leadership development and organization-wide leader performance. All three measures of organization-wide leader performance have statistically significant relationships with measures of organizational support for leadership development. For the two measures referencing immediate leader performance, the two measures of leadership development support that have significant and positive relationships with these performance measures also directly reference leaders. The validity of these relationships is suspect because of the direct reference by all measures to the immediate leader, which could be a consequence of generalized bias related to the responders' overall perception of their immediate leader. Significant relationships with the other leadership support measures that do not refer to immediate leaders would temper questions regarding this kind of bias, however there are no such results.

The third measure of organization-wide leader performance has two significant and negative relationships with measures of organizational support for leadership development and a

significant and positive relationship with another. This result could be a consequence of the measure referring to a higher level of leadership than the other two measures. The hierarchical and relational distance most responders likely have from the senior leadership could result in different responses than those related to leaders with a more proximal leadership relationship. Despite any explanations of the relationships, the evidence is not available or unimpeachable enough to state that Hypothesis 7 is supported.

To summarize, the results of the statistical analysis provide evidence to support the viability of the model of effect transfer from organizational support for leadership development to the manifestation of a number of effective leader competencies, skills, and behaviors, in addition to performance benefits. The results also supply evidence for the value of organizational support for leadership development as it relates to positive organizational outcomes. Two of nine hypotheses received broad evidentiary support; four more received moderate support. Of the three hypotheses not receiving support, the most important to effective leadership is empowerment. The other two, motivating others and leader performance, are very subjective and can easily be influenced by factors that can mitigate the effects of support for leadership development.

Intangible Return on Investment Benefits Linked to Leader Development

Having established evidence for the value of organizational support in relation to both the organizational capacity of effective leadership skills, competencies, and behaviors and organizational performance, this study now returns to the framework of return on investment (R.O.I.). The purpose of utilizing the concept of R.O.I. in this study is to establish a basis within which to consider and interpret the coefficients produced by the statistical analysis in this study. The concept of R.O.I. provides a functional way to think about organizational support for

leadership development and its effects on organizational leadership development, organizational capacity of effective leadership outcomes, and organizational performance outcomes. As described earlier, R.O.I. calculations related to development involve comparing the costs of development with the financial benefits attributed to the related performance enhancements (Phillips 2003). The remainder of this section will make a case for a modified conceptualization of R.O.I. that works within the information constraints of the federal government, to provide a framework for understanding the results of this study's statistical analyses.

As illustrated in previous chapters, publicly available spending data for development in federal agencies is not yet sufficient to lend itself to analysis. Therefore to construct a R.O.I type framework for leadership development in federal organizations, one must first propose an alternate measure of investment. In this case, if one accepts the perceived level of organizational support for leadership development as a proxy for organizational level of investment in leadership, then the first half of our alternative R.O.I. comparison framework, the organizational investment, is identified.

Now we must develop the second half of the R.O.I. framework – the organizational benefit from the investment in leadership development. This study has already argued that quality leadership development opportunities are readily available to federal employees; they simply require the support of the organization to take advantage of them. This study has also established that outcomes of quality leadership development include effective leadership skills, competencies, and behaviors in addition to organizational performance improvements. These outcomes are beneficial to the federal organizations that realize them, but are not easily monetized. Soft skills, such as leadership skills, competencies, and behaviors, are not readily quantifiable. Performance outcomes in government are often difficult to measure in the first

place (Boyne et al. 2006) and don't frequently lend themselves to the assignment of monetary values. In the context of leadership development R.O.I., Phillips and Phillips (2007) refer to these unquantifiable benefits as "intangibles."

Phillips and Phillips (2007, 160) recognize these intangible benefits as "very important" to the organization "because they represent the human dynamics element in the work environment." In the context of R.O.I., they are an "important part of the overall evaluation" and "should be identified, explored, examined, monitored, and analyzed for changes" (Phillips 2003). Phillips and Phillips (2007, 161) provide a table of intangibles associated with leadership development, which match very closely with the effective leadership and performance outcomes measured in this study. The table is reproduced in part in Table 7.1 below.

Table 7.1 ***Typical Intangibles Linked with Leadership Development***

• Job satisfaction	• Decisiveness
• Organizational Commitment	• Communication
• Engagement	• Creativity
• Teamwork	• Competencies
• Cooperation	

(Phillips and Phillips 2007, 161)

Following the example of Phillips and Phillips, we can now establish the second half of the R.O.I. framework, the benefits of leadership development. If we accept that the effective leadership and performance outcomes measured in this study are all intangible benefits linked to leadership development, we can treat the level of these measures in relation to the levels of organizational support for leadership development (investment) as the return on the investment. With this framework established if one returns to the regression results of this study, within this conceptualization of R.O.I. the reader can interpret a significant and positive regression coefficient as the return on investment, in the form of a *coefficient value* average organizational

perception level increase in the effective leadership or performance outcome for an one level average increase in the measure of organizational support for leadership development. To provide an example, for the goalsetting hypothesis measure: *Managers communicate the goals and priorities of the organization*, an one level average increase in leader agreement to the support item, *my training needs are assessed*, results in a return of a 0.287 average level increase in agreement that managers communicate the goals and priorities of the organization.

A survey of the coefficients of the regressions contained in the supported hypotheses indicates that in this study, the practical effect of organizational support for leadership development on the outcome measures, or as we have argued for here, the R.O.I., is small, ranging from a 0.091 to a 0.522 average level increase in positive response to the outcome measure. Despite the fact these effects appear small, it is important to remember that the measures being used are average measures organization-wide. Aggregate measures do not capture the individual effects, which could be larger than those reported here. Also, these effects are generalized across-organization, which may dilute the impact of support for leadership development even more so than if the effects were isolated at a more granular level, such as at the department level within an organization.

In addition, noting the theoretical model developed in chapter 3, the effect of leadership development support on leader behaviors and performance is also moderated through the leadership development process. If leadership development opportunities are poorly designed or inadequate, and/or if the skills, competencies, and behaviors learned as part of the opportunities do not endure or manifest in a positive manner, then the positive effect of support for leadership development on observable skills, competencies, and behavior can be muted or adulterated. In addition, the measures employed in this study were not designed explicitly to capture support for

leadership development or the effects of that support. As such, a study designed to more directly measure support and related outcomes could reveal even larger effects.

In support of continued research regarding this topic, it is important to point out that 6 out of 9 hypothesized effects are supported to some extent by statistically significant results, even when the relationships are diluted by aggregation and the sample size shrinks to approximately 230. Despite the use of imperfect measures and having limited controls, most regression models realize high adjusted R-squared values, indicating that the models explain a substantial amount of the variance in the data. And the statistically significant positive effects found lend support to the findings from previous research into the topic of leadership development and its effects on leader skills, competencies, and behaviors, as well as complementary effects on performance.

CHAPTER 8

CONCLUSIONS

Concerted leadership development across the federal government is an objective frequently identified as important to government performance yet noted as being neglected by many agencies. A variety of studies from government sources have made the case that federal agencies should provide and be provided more support for leadership development, but base their arguments on frequencies of survey responses and anecdotal evidence. Additionally, a number of research streams focusing on the public sector have developed empirical evidence that the quality of organizational leadership influences a number of organizational factors, including environment and performance.

Despite the established impact of public leaders on organizations and the noted deficiencies in public sector leadership development, very little empirical research exists investigating the effect of leadership development on organizations in the public sector. Nearly all research in this area centers on private sector organizations. Given that public sector research has established the need for high quality, effective leaders, a complementary topic of study should be the evaluation of if and how leadership development in government produces beneficial improvements in leader effectiveness. This dissertation employs a model of leadership development effect and measures from a survey of federal personnel to empirically test hypotheses proposing effects of organizational support of leadership development on organization-wide perceptions of leader skills, competencies, and behaviors, as well as aspects of organization performance.

This model and the hypotheses derived from it are built upon previous research from a number of streams focusing on public management, leadership, human capital development, and organizations. Literature from the study of public sector management establishes that leaders' influence and actions affects the performance of employees and, consequently, that of organizations. Studies, mostly of private sector leadership development, provide evidence that development opportunities can positively shape the skills, competencies, and behaviors of leaders, making them more effective. Consequently, leadership development can also have a positive effect on individual and organizational performance. Theory, reinforced by findings from the private sector, proposes that organizational support for leadership development is a primary antecedent of effective leadership development, with consequential effects on leader skills, competencies, and behaviors, as well as, organization performance. Finally, another stream of research from the study of leadership provides a collection of skills, behaviors, and competencies that are characteristic of effective leaders, which would ideally be fostered by well-designed leadership development opportunities. The integration of these various areas of research form the foundation for the theory and hypotheses tested in this study.

Empirical tests find varying levels of support for six of the nine hypotheses proposed in this study. Organizational support for leadership development is found to have positive effects on goal setting, communication, performance evaluation, meritocratic principles, talent utilization, and work quality. Organizational support for leadership development has weak or indeterminate effects on empowerment, motivating others, and leader performance. The hypotheses supported by the empirical analysis match findings from the private sector, lending further credence to the value of leadership development to the organization established by previous research (Ban and Faerman 1990; Burke and Day 1986; Cameron and Ulrich 1986; Collins and Holton 2004; Day

2001) and, consequentially, organizational support of leadership development.

The hypotheses not supported by the analysis require consideration. The lack of evidence for a consistent effect on motivation can be discounted by the complexity of this psychological construct. Employee empowerment is considered an important competency of effective leaders. For the reasons described in the preceding chapter, empowerment may be difficult to execute in the public sector environment and consequently is a leadership behavior that does not manifest as readily. Finally, subjective impressions of leaders, including recent actions and interpersonal interactions between the responder and his/her direct leader could influence perceptions of leader performance and bias statistical results, making this hypothesis's positive results of suspect validity.

The analysis of the data and the positive results in this study also establishes evidence for the value of support for leadership development in the public sector. Within this study's R.O.I. framework, organizational support does provide a level of organizational return. Despite the fact that this return appears small in most cases, the moderating effects of the structure of the study data and model could be masking a larger effect. The results of this study indicate that it is worthwhile to further pursue a clearer understanding of the nature and magnitude of the effects.

This study provides evidence that organization support for leadership development can have positive effects on an organization. As described at the beginning of this study, a number of sources have argued that the federal government as a whole is doing a poor job of developing its leaders and may be paying for the consequences of this neglect on an individual, organizational, and government-wide level. The results of this study may be used as a basis to develop more evidence in favor of endeavoring to overcome this general attitude of neglect. The work done here lends credence to the importance of support for leadership development in the federal

government. As this study has established, the opportunities for leader development in the federal government are readily available. Support is needed to encourage current and potential leaders to take advantage of those opportunities.

Support does not have to only take the form of money, although financial support is likely a strong influence on development effect. Support can also be an established plan of development to guide leaders. It can be attention to the topic from the direct supervisor of the developing leader. It can be opportunities within the organization to learn and exercise new skills, competencies, and behaviors on the job. It can be a pervasive culture of employee development throughout the organization. All of these and more can serve as support. If the organization can establish a broad commitment to the principle of expansive support of leadership development, this study provides evidence that it can realize organizational benefits from this support.

Methodological Issues

There are several potential methodological issues related to this study that could call the analysis results into question. First, the presence of an explanatory variable that is correlated with the error in the model, otherwise known as endogeneity, presents a potential problem. This situation could be the result of functional form misspecification of the regression model. *F*-tests and regression specification error tests indicate that functional form misspecification is not a problem in any of the models (Wooldridge 2006).

Another cause of endogeneity could be the omission of an unobserved explanatory variable. In this study, availability and quality of leadership development opportunities in the federal government is assumed, not measured. As illustrated by the model of leadership development effects in this study, both access to and the quality of the leadership development

opportunities, independent of support for leadership development, can have effects on the manifestation of leader skills, competencies, and behaviors, as well as performance. Because the effect of support is filtered through the actual leadership development opportunities, it can be enhanced or diminished by the quality of and access to opportunities. By not accounting for the moderating effect of the quality and availability of development opportunities, this study is not able to accurately measure the true support effect. But given that effects were found, it can be assumed that enough quality and access exist in development opportunities not to negate the influence of development support.

A second potential methodological issue related to the use of survey data is response bias. This study relies on a single source for the dependent and independent variables. Consequently, the results of the study are subject to questions of validity due to the potential presence of mono-method bias. If, as in this study, the same respondents measure the independent and dependent variables, then the common variance present in this study between measures may be a consequence of response bias related to that single source, rather than a true relationship between the measures.

A number of characteristics of this study help mitigate concerns regarding mono-method bias. All measures are aggregated to the organization sub-element level, which can temper manifestations of individual level bias, but not persistent sub-element-wide bias. The sample populations measuring the independent variables of interest focusing on leadership development support (organization employees in leadership positions) and dependent variables (all organization employees) are different. This means that the potential of the full sample population that forms these independent variables to bias the overall response results in the dependent variables is lessened, because employees in leadership positions make up only 44% of all

respondents. Often, bias in perceptual survey responses is produced by characteristics of the respondent, most significantly satisfaction. This survey controls for a number of potentially bias producing characteristics, including for job satisfaction using a scale of five measures and for leader satisfaction with training. Social desirability of responses can also introduce bias into survey measures. The potential for this problem is mitigated by the fact that all survey responses were collected anonymously. These factors should help alleviate concerns regarding questionable validity due to mono-method bias.

Possibilities for Future Research

The research in this dissertation develops the potential for a number of future avenues of investigation. Primarily, it provides evidence for the viability of and need for pursuing the study of leadership development in the public sector and its effects on individuals and organizations. The results of this study indicate that, generally, the federal government has a leadership development structure in place that, when taken advantage of organization-wide, can produce positive organizational effects. This outcome is expected, given the previous research in the public sector (Ban and Faerman 1990; Cameron and Ulrich 1986) and in the private sector (Burke and Day 1986; Collins and Holton 2004; Day 2001). Considering this evidence indicating positive effects of organizational support for leadership development on a number of organization-wide leader skills, competencies, and behaviors, as well as aspects of organization performance, future research should seek to further confirm the presence of these effects and seek to identify their drivers more specifically.

The federal government provides a unique environment within which to study generalizable effects of leadership development. It is made up of large, medium, and small organizations, which perform a wide variety of functions and are staffed with diverse populations

of individuals. These organizations have access to a uniform set of leadership development opportunities offered by OPM, of which each organization can determine the level of access and utilization desired. The federal government also regularly collects data related to organization performance, organization environment, and, increasingly, type and cost of development, among other useful measures. All of these factors create a valuable research environment with a number of controls in place and the benefits of both consistency and variability across organizations, a situation not available in the private sector where inter-organizational comparisons are difficult due to data insufficiency and comparability concerns.

Future research confirming the effects of organizational support for leadership development should attempt to incorporate data over time, which can provide proof of consistent effects that may by anomalous to cross-sectional data. Such research should also seek other measures of support, such as expenditures for leadership training; other controls, such as development opportunity quality; as well as other outcome measures. These measures should come from a variety of independent sources in order to minimize the possibility of bias in the data analysis. Possible sources include the still-developing EHRI for development expenditure data and the Performance Assessment Rating Tool scores or other organizational performance measures.

Potential research opportunities to seek out the drivers of organizational effects of leadership development could make use of unique programs that offer structured development for employees such as OPM's Leadership Education and Development certificate program or the Presidential Management Fellow program. These initiatives could be used to develop comparison groups both within and between organizations to test the effects of leadership development structure and content on outcomes. The data collected in the EHRI identifying

specific types of development completed could be another source of useful data to investigate the drivers of effects related to leadership development.

This dissertation seeks to fill a gap in the public sector leadership development research literature. It is the hope of the author that this study can contribute to a variety of fields of study, including leadership, human capital development, public management, and public sector performance. This dissertation employs aggregate measures primarily from a large-n survey of federal employees to investigate the effects of organizational support for leadership development on organization-wide leader skills, competencies, and behaviors, as well as aspects of organization performance. Research and theory from a number of sources and fields informed the development of a theoretical model explaining the effect of organizational support for leadership development on these outcomes. Employing OLS regression to analyze the data, the results provide support for the proposition that organizational support for leadership development positively influences a number of skills, competencies, and behaviors attributed to effective leaders, as well as some measures of performance, organization-wide. As such, this study provides evidence to encourage further study of leadership development in the public sector, to fill a gap in the field of public management research, and also to reinforce the utility of leadership development for organizations.

REFERENCES

Aguinis, Herman, and Kurt Kraiger. 2009. Benefits of training and development for individuals and teams, organizations, and society. *Annual Review of Psychology* 60 (1): 451-74.

American Society for Training and Development. 2009. *2009 State of the industry.* Alexandria, VA: American Society for Training and Development, http://www.astd.org/content/research/stateOfIndustry.htm (accessed December 15, 2009).

———. 2007. *2007 State of the industry report.* Alexandria, VA: American Society for Training and Development, http://store.astd.org/Default.aspx?tabid=167&ProductId=18667 (accessed September 3, 2009).

———. 2004. *2004 State of the industry report.* Alexandria, VA: American Society for Training and Development, http://www.astd.org/NR/rdonlyres/661B8224-B793-43BB-87BF-0CC1903F1E3C/0/SOIR_2004_Executive_Summary.pdf (accessed September 3, 2009).

Arthur, Jr., Winfred, Winston Bennett, Jr., Pamela S. Edens, and Suzanne T. Bell. 2003. Effectiveness of training in organizations: A meta-analysis of design and evaluation features. *Journal of Applied Psychology* 88 (2): 234-45.

Ban, Carolyn, and Sue R. Faerman. 1990. Issues in the evaluation of management training. *Public Productivity & Management Review* 13 (3) (Spring): 271-86.

Bandura, Albert. 2001. Social cognitive theory: An agentic perspective. *Annual Review of Psychology* 52: 1-26.

Behn, Robert D. 1994. *Leadership counts: Lessons for public managers from the Massachusetts welfare, training, and employment program.* Cambridge, Mass.: Harvard University Press.

Berman, Evan M., James S. Bowman, Jonathan P. West, and Montgomery R. Van Wart. 2010. *Human resource management in public service: Paradoxes, processes, and problems.* 3rd ed. Thousand Oaks, Calif: SAGE Publications.

Berman, Evan M., and Jonathan P. West. 2003a. What is managerial mediocrity? Definition, prevalence, and negative impact (part 1). *Public Performance & Management Review* 27 (2): 9-29.

———. 2003b. Solutions to the problem of managerial mediocrity: Moving up to excellence (part 2). *Public Performance & Management Review* 27 (2): 30-52.

Bilmes, Linda, and W. Scott Gould. 2009. *The people factor: Strengthening America by investing in public service.* Washington, D.C.: Brookings Institution Press.

Boyne, George A., Kenneth J. Meier, Laurence J. O'Toole, Jr., and Richard M. Walker, eds. 2006. *Public service performance: Perspectives on measurement and management*, eds. George A. Boyne, et al. Cambridge: Cambridge University Press.

Brewer, Gene A. 2005. In the eye of the storm: Frontline supervisors and federal agency performance. *Journal of Public Administration Research and Theory* 15 (4): 505-27.

Burke, Michael J., and Russell R. Day. 1986. A cumulative study of the effectiveness of managerial training. *Journal of Applied Psychology* 71 (2): 232-45.

Cameron, Kim S., and David O. Ulrich. 1986. Transformational leadership in colleges and universities. In *Higher education: Handbook of theory and research.*, ed. John C. Smart. Vol. 2, 1-42. New York: Agathon Press.

Chun, Young Han, and Hal G. Rainey. 2005. Goal ambiguity and organizational performance in U.S. federal agencies. *Journal of Public Administration Research & Theory* 15 (4): 529-57.

Collins, Doris B., and Elwood F. Holton. 2004. The effectiveness of managerial leadership development programs: A meta-analysis of studies from 1982 to 2001. *Human Resource Development Quarterly* 15 (2): 217-48.

Daft, Richard L. 2007. *Organization theory and design*. 9th ed. Mason, OH: Thompson-South Western.

Day, David V. 2001. Leadership development: A review in context. *The Leadership Quarterly* 11 (4): 581-613.

Deci, Edward L., and Richard M. Ryan. 2002. *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.

Doig, Jameson W., and Erwin C. Hargrove. 1990. *Leadership and innovation: Entrepreneurs in government*. Abridged. Baltimore: Johns Hopkins University Press.

Faerman, Sue R., and Carolyn Ban. 1993. Trainee satisfaction and training impact: Issues in training evaluation. *Public Productivity & Management Review* 16 (3): 299-314.

Fulmer, Robert M., and Philip A. Gibbs. 1998. Lifelong learning at the corporate university. *Career Development International* 3 (5): 177-84.

Fulmer, Robert M., and Marshall Goldsmith. 2001. *The leadership investment: How the world's best organizations gain strategic advantage through leadership development.* New York: Amacom.

Hargrove, Erwin C., and John C. Glidewell. 1990. *Impossible jobs in public management*. Lawrence, Kan.: University Press of Kansas.

Ingraham, Patricia W., Philip G. Joyce, and Amy Kneedler Donahue. 2003. *Government performance: Why management matters.* Johns Hopkins studies in governance and public management. Baltimore: Johns Hopkins University Press.

Kellough, J. Edward, and Haoran Lu. 1993. The paradox of merit pay in the public sector: Persistence of a problematic procedure. *Review of Public Personnel Administration* (13) (April 1993): 45-64.

Kettl, Donald F., and H. Brinton Milward. 1996. *The state of public management*. Baltimore: Johns Hopkins University Press.

Kirkpatrick, Donald L., and James D. Kirkpatrick. 2007. *Implementing the four levels: A practical guide for effective evaluation of training programs.* 1st ed. San Francisco: Berrett-Koehler Publishers.

Lewis, Eugene. 1980. *Public entrepreneurship: Toward a theory of bureaucratic political power: The organizational lives of Hyman Rickover, J. Edgar Hoover, and Robert Moses*. Bloomington: Indiana University Press.

Locke, Edwin A., and Gary P. Latham. 2002. Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist* 57 (9): 705-17.

Lynn, Laurence E., Jr., Carolyn J. Heinrich, and Carolyn J. Hill. 2000. Studying governance and public management: Why? How? In *Governance and performance: New perspectives.*, eds. Carolyn J. Heinrich, Laurence E. Lynn, Jr., 1-33. Washington, D.C.: Georgetown University Press.

Meier, Kenneth J., and Laurence J. O'Toole, Jr. 2009. The proverbs of new public management: Lessons from an evidence-based research agenda. *American Review of Public Administration* 39 (1): 4-22.

Meier, Kenneth J., and Laurence J. O'Toole Jr. 2002. Public management and organizational performance: The effect of managerial quality. *Journal of Policy Analysis and Management* 21 (4): 629-43.

Meister, Jeanne C. 1998. *Corporate universities: Lessons in building a world-class work force.* New York: McGraw-Hill.

Moynihan, Donald P., and Sanjay K. Pandey. 2005. Testing how management matters in an era of government by performance management. *Journal of Public Administration Research & Theory* 15 (3): 421-39.

Mumford, Alan. 1997. *Management development: Strategies for action.* Developing strategies. 3rd ed. London: Institute of Personnel and Development.

National Academy of Public Administration. 2003. *First-line supervisors in the federal service: Their selection, development, and management.* Vienna, VA: Management Concepts.

National Commission on the Public Service. 2003. *Urgent business for America: Revitalizing the federal government for the 21st century.* Washington D.C.: National Commission on the Public Service, http://www.brookings.edu/gs/cps/volcker/reportfinal.pdf (accessed June 18, 2009).

———. 1989a. *Leadership for America: Rebuilding the public service.* Washington: National Commission on the Public Service.

———. 1989b. *Leadership for America: Rebuilding the public service: Task force reports to the national commission on the public service.* Washington: National Commission on the Public Service.

Nicholson-Crotty, Sean, and Laurence J. O'Toole, Jr. 2004. Public management and organizational performance: The case of law enforcement agencies. *Journal of Public Administration Research & Theory* 14 (1): 1-18.

O'Toole, Jr., Laurence J., and Kenneth J. Meier. 2009. The human side of public organizations: Contributions to organizational performance. *American Review of Public Administration* 39 (5): 499-518.

O'Toole, Jr., Laurence J., and Kenneth J. Meier. 1999. Modeling the impact of public management: Implications of structural context. *Journal of Public Administration Research & Theory* 9 (4): 505-26.

Paddock, Susan C. 1997. Benchmarks in management training. *Public Personnel Management* 26 (4): 441-60.

Partnership for Public Service. 2008a. *Brain drain 2008.* Washington D.C.: Partnership for Public Service.

———. 2008b. *Roadmap to reform: A management framework for the next administration.* Washington D.C.: Partnership for Public Service.

Partnership for Public Service, and Grant Thornton, LLP. 2008. *Elevating our federal workforce: Chief human capital officers offer advice to President Obama.* Washington D.C.: Partnership for Public Service and Grant Thornton LLP, http://www.ourpublicservice.org/OPS/publications/download.php?id=130 (accessed July 29, 2009).

Phillips, Jack J. 2003. *Return on investment in training and performance improvement programs*. Improving human performance series. 2nd ed. Amsterdam; Boston: Butterworth-Heinemann.

Phillips, Jack J., and Patti Phillips. 2007. Measuring return on investment in leadership development. In *The handbook of leadership development evaluation*. eds. Kelly Hannum, Jennifer Martineau, and Claire Reinelt. 1st ed., 137-166. San Francisco: Jossey-Bass.

Porter, Lyman W., and Lawrence E. McKibbin. 1988. *Management education and development: Drift or thrust into the 21st century*?. New York: McGraw-Hill Book Co.

Rainey, Hal G. 2003. *Understanding and managing public organizations.* The Jossey-Bass nonprofit and public management series. 3rd ed. San Francisco: Jossey-Bass.

Rainey, Hal G., and Barry Bozeman. 2000. Comparing public and private organizations: Empirical research and the power of the A priori. *Journal of Public Administration Research & Theory* 10 (2): 447-70.

Rainey, Hal G., and Paula Steinbauer. 1999. Galloping elephants: Developing elements of a theory of effective government organizations. *Journal of Public Administration Research & Theory* 9 (1): 1-32.

Riccucci, Norma. 2005. *How management matters: Street-level bureaucrats and welfare reform.* Public management and change. Washington, D.C.: Georgetown University Press.

———. 1995. *Unsung heroes: Federal execucrats making a difference.* Washington, D.C.: Georgetown University Press.

Salas, Eduardo, and Janis Cannon-Bowers. 2001. The science of training: A decade of progress. *Annual Review of Psychology* 52 (1): 471-99.

Schermerhorn, John R., Richard Osborn, and James G. Hunt. 2005. *Organizational behavior.* 9th ed. New York: Wiley.

Tannenbaum, Scott I., and Gary Yukl. 1992. Training and development in work organizations. *Annual Review of Psychology* 43 (1): 399-441.

Tharenou, Phyllis, Alan M. Saks, and Celia Moore. 2007. A review and critique of research on training and organizational-level outcomes. *Human Resource Management Review* 17 (3): 251-73.

United States Government Accountability Office. June 2005. *Human capital: Selected agencies have opportunities to enhance existing succession planning and management efforts.* Washington D.C.: United States Government Accountability Office, GAO-05-585.

———. February 2004. *High-performing organizations: Metrics, means, and mechanisms for achieving high performance in the 21st century public management environment.* Washington D.C.: United States Government Accountability Office, GAO-04-343SP.

United States Merit Systems Protection Board. 2009a. *As supervisors retire: An opportunity to reshape organizations.* Washington D.C.: United States Merit Systems Protection Board, http://www.mspb.gov/netsearch/viewdocs.aspx?docnumber=457394&version=458606&application=ACROBAT (accessed November 19, 2009).

———. 2009b. *Managing for engagement – communication, connection, and courage.* Washington D.C.: United States Merit Systems Protection Board, http://www.mspb.gov/netsearch/viewdocs.aspx?docnumber=437591&version=438697&application=ACROBAT (accessed August 25, 2009).

———. 2007. *Accomplishing our mission: Results of the merit principles survey 2005.* Washington D.C.: United States Merit Systems Protection Board, http://www.mspb.gov/NETSEARCH/launchit.aspx?url=/netsearch/viewdocs.aspx&docnumber=251283&version=251556&application=ACROBAT (accessed January 15, 2009).

United States Office of Personnel Management. 2009a. *Fiscal year 2008 annual performance report.* Washington D.C.: United States Office of Personnel Management, http://www.opm.gov/gpra/opmgpra/performance_report2008.pdf (accessed February 23, 2010).

———. 2009b. *Results from the 2008 federal human capital survey*. Washington D.C.: United States Office of Personnel Management, http://www.fhcs.opm.gov/2008FILES/2008_Govtwide_Report.pdf (accessed July 1, 2009).

———. 2008. *An analysis of federal employee retirement data: Predicting future retirements and examining factors relevant to retiring from the federal service*. Washington D.C.: United States Office of Personnel Management, http://www.opm.gov/feddata/RetirementPaperFinal_v4.pdf (accessed January 13, 2010).

———. 2007. *Results from the 2006 federal human capital survey*. Washington D.C.: United States Office of Personnel Management, http://www.fhcs.opm.gov/2006FILES/FHCS_2006_Report.pdf (accessed March 31, 2009).

———. 2001. *Supervisors in the federal government: A wake-up call*. Washington D.C.: United States Office of Personnel Management, https://www.opm.gov/studies/sups.pdf (accessed July 29, 2009).

Van Velsor, Ellen, Cynthia D. McCauley, and Marian N. Ruderman. 2010. *The center for creative leadership handbook of leadership development*. J-B CCL (Center for Creative Leadership). 3rd ed. San Francisco: Jossey-Bass.

Van Wart, Montgomery. 2005. *Dynamics of leadership in public service: Theory and practice*. Armonk, N.Y.: M.E. Sharpe.

Voinovich, George V. 2000. *Report to the president: The crisis in human capital*. Washington D.C.: Subcommittee on Oversight of Government Management, Restructuring and the District of Columbia Committee on Governmental Affairs, http://hsgac.senate.gov/humancapital.pdf (accessed July 21, 2009).

Whetten, David A., and Kim S. Cameron. 2007. *Developing management skills*. 7th ed. Upper Saddle River, NJ: Prentice Hall.

Wooldridge, Jeffrey M. 2006. *Introductory econometrics: A modern approach.* 3rd ed. Mason, OH: Thomson/South-Western.

Yukl, Gary A. 2006. *Leadership in organizations*. 6th ed. Upper Saddle River, NJ: Pearson/Prentice Hall.

APPENDICES

APPENDIX A

Measures

Independent Variable Measures

Leader Development

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree

2. I am given a real opportunity to improve my skills in my organization.

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

48. Supervisors/team leaders provide employees with constructive suggestions to improve their job performance.
49. Supervisors/team leaders in my work unit support employee development.
51. My training needs are assessed.

Dependent Variable Measures

Goal Setting Measures (Dependent Variables)

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

19. I know how my work relates to the agency's goals and priorities.
40. Managers communicate the goals and priorities of the organization.
41. Managers review and evaluate the organization's progress toward meeting its goals and objectives.

Dependent Variable Measures (continued)

Motivating Others Measure (Dependent Variable)

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

38. In my organization, leaders generate high levels of motivation and commitment in the workforce.

Empowerment Measures (Dependent Variables)

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree

4. I feel encouraged to come up with new and better ways of doing things.

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree

13. Supervisors/team leaders in my work unit provide employees with the opportunities to demonstrate their leadership skills.
24. Employees have a feeling of personal empowerment with respect to work processes.
26. Creativity and innovation are rewarded.

Very Satisfied, Satisfied, Neither Satisfied nor Dissatisfied, Dissatisfied, Very Dissatisfied

55. How satisfied are you with your involvement in decisions that affect your work?

Meritocratic Principles Measures (Dependent Variables)

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

22. Promotions in my work unit are based on merit.
23. In my work unit, steps are taken to deal with a poor performer who cannot or will not improve.
25. Employees are rewarded for providing high quality products and services to customers.
27. Pay raises depend on how well employees perform their jobs.
28. Awards in my work unit depend on how well employees perform their jobs.

Dependent Variable Measures (continued)

Performance Evaluation Measures (Dependent Variables)

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

29. In my work unit, differences in performance are recognized in a meaningful way.

30. My performance appraisal is a fair reflection of my performance.

31. Discussions with my supervisor/team leader about my performance are worthwhile.

32. In my most recent performance appraisal, I understood what I had to do to be rated at different performance levels (for example, Fully Successful, Outstanding).

Very Satisfied, Satisfied, Neither Satisfied nor Dissatisfied, Dissatisfied, Very Dissatisfied

57. How satisfied are you with the recognition you receive for doing a good job?

Management Performance Measures (Dependent Variables)

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree

7. I have trust and confidence in my supervisor.

37. I have a high level of respect for my organization's senior leaders.

Very Good, Good, Fair, Poor, Very Poor

9. Overall, how good a job do you feel is being done by your immediate supervisor/team leader?

Dependent Variable Measures (continued)

Communication Measures (Dependent Variables)

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

52. Managers promote communication among different work units (for example, about projects, goals, needed resources).

Very Satisfied, Satisfied, Neither Satisfied nor Dissatisfied, Dissatisfied, Very Dissatisfied

56. How satisfied are you with the information you receive from management on what's going on in your organization?

Talent Utilization Measure (Dependent Variable)

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

18. My talents are used well in the workplace.

Work Quality Measures (Dependent Variables)

Very Good, Good, Fair, Poor, Very Poor

10. How would you rate the overall quality of work done by your work group?

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

33. I am held accountable for achieving results.

Controls

Interaction Effect and Control

Very Satisfied, Satisfied, Neither Satisfied nor Dissatisfied, Dissatisfied, Very Dissatisfied

60. How satisfied are you with the training you receive for your present job?

Controls (continued*)*

Job Satisfaction (Combined into a scale "Satisfaction Scale")

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree

5. My work gives me a feeling of personal accomplishment.

8. I recommend my organization as a good place to work.

Very Satisfied, Satisfied, Neither Satisfied nor Dissatisfied, Dissatisfied, Very Dissatisfied

58. How satisfied are you with the policies and practices of your senior leaders?

61. Considering everything, how satisfied are you with your job?

63. Considering everything, how satisfied are you with your organization?

Intrinsic Value of Work

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree

6. I like the kind of work I do.

20. The work I do is important.

Capacity

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

11. The workforce has the job-relevant knowledge and skills necessary to accomplish organizational goals.

14. My work unit is able to recruit people with the right skills.

16. I have sufficient resources (for example, people, materials, budget) to get my job done.

17. My workload is reasonable.

Controls (continued)

Policy Responsibility

Hybrid?

Yes/No

Non-Regulatory?

Yes/No

Headquarters?

Yes/No

Agency Size

Number of FTE

Professionalism

Proportion of professionals to total number of employees

Supervisory Status

What is your supervisory status?

[1] *Non-Supervisor: You do not supervise other employees.*

[2] *Team Leader: You are not an official supervisor; you provide employees with day-to-day guidance in work projects, but do not have supervisory responsibilities or conduct performance appraisals.*

[3] *Supervisor: You are responsible for employees' performance appraisals and approval of their leave, but you do not supervise other supervisors.*

[4] *Manager: You are in a management position and supervise one or more supervisors.*

[5] *Executive: Member of Senior Executive Service or Equivalent.*

Controls (continued)

Hispanic?

Yes/No

Race (Converted to a dichotomous variable – Caucasian Yes/No)

[A] *American Indian or Alaska Native*

[B] *Asian*

[C] *Black or African American*

[D] *Native Hawaiian or Other Pacific Islander*

[E] *White*

[F] *Two or more races (Not Hispanic or Latino)*

Age Group

[1] *29 and under*

[2] *30-39*

[3] *40-49*

[4] *50-59*

[5] *60 or older*

Pay Category

[1] *Federal Wage System ex. WB, WD, WG, WL, WM, WS, WY*

[2] *GS 1-6*

[3] *GS 7-12*

[4] *GS 13-15*

[5] *Senior Executive Service, Senior Level (SL), or Scientific or Professional (ST)*

Controls (continued)

Additional Controls in *Performance Evaluation* Hypothesis Regressions

Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree, Do Not Know

31. Discussions with my supervisor/team leader about my performance are worthwhile.
32. In my most recent performance appraisal, I understood what I had to do to be rated at different performance levels (for example, Fully Successful, Outstanding).

APPENDIX B

Agencies Included in 2008 FHCS Survey

President's Management Council Agencies

- Department of Agriculture
- Department of Commerce
- Department of Defense
    - Department of the Army
    - Department of the Navy
    - Department of the Air Force
    - U.S. Army Corps of Engineers
    - U.S. Marine Corps
- Department of Education
- Department of Energy
- Department of Health and Human Services
- Department of Homeland Security
- Department of Housing and Urban Development
- Department of the Interior
- Department of Justice
- Department of Labor
- Department of State
- Department of Transportation
- Department of the Treasury

President's Management Council Agencies (continued)

- Department of Veterans Affairs
- United States Agency for International Development
- Environmental Protection Agency
- General Services Administration
- National Aeronautics and Space Administration
- National Science Foundation
- Office of Management and Budget
- Office of Personnel Management
- Small Business Administration
- Social Security Administration

Small/Independent Agencies

- Advisory Council on Historic Preservation
- African Development Foundation
- American Battle Monuments Commission
- Broadcasting Board of Governors
- Chemical Safety and Hazard Investigation Board
- Commission on Fine Arts
- Commission on Civil Rights
- Committee for Purchase from People who are Blind
- Commodity Futures Trading Commission
- Consumer Product Safety Commission

Small/Independent Agencies (continued)

- Corporation for National and Community Service
- Court Services and Offender Supervision Agency
- Defense Nuclear Facilities Safety Board
- Equal Employment Opportunity Commission
- Export-Import Bank of the United States
- Federal Communications Commission
- Federal Election Commission
- Federal Energy Regulatory Commission
- Federal Housing Finance Board
- Federal Labor Relations Authority
- Federal Maritime Commission
- Federal Retirement Thrift Savings Board
- Federal Trade Commission
- Harry S. Truman Scholarship Foundation
- Inter-American Foundation
- International Boundary and Water Commission
- James Madison Memorial Fellowship Foundation
- Marine Mammal Commission
- Merit Systems Protection Board
- National Archives and Records Administration
- National Capital Planning Commission

Small/Independent Agencies (continued)

- National Council on Disability
- National Credit Union Administration
- National Endowment for the Arts
- National Endowment for the Humanities
- National Indian Gaming Commission
- National Labor Relations Board
- National Mediation Board
- National Transportation Safety Board
- Nuclear Regulatory Commission
- Nuclear Waste Technical Review Board
- Occupational Safety and Health Review Commission
- Office of Government Ethics
- Office of Federal Housing Enterprise Oversight
- Office of U.S. Trade Representative
- Overseas Private Investment Corporation
- Pension Benefit Guaranty Corporation
- Postal Regulatory Commission
- Railroad Retirement Board
- Securities and Exchange Commission
- Selective Service System
- Surface Transportation Board

Small/Independent Agencies (continued)

- Trade and Development Agency
- U.S. International Trade Commission