Predicting Managerial Performance: Testing an Integrated Model

by

Christopher Brian Flynn

A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
May 4, 2013

Approved by

Alan G. Walker, Chair, Associate Professor of Management, Department of Management
Hubert S. Feild, Torchmark Professor of Management, Department of Management
Daniel J. Svyantek, Professor, Chair of Department of Psychology

Abstract

In today's complex business environment the role of middle managers is critical for organizational success (Hansen & Wernerfelt, 1989; Ren & Guo, 2011). This is because middle managers must deal with high levels of complexity in the process of communicating organizational goals and directives from top management to line workers and simultaneously oversee operations and communicate performance information from line workers back to top management (Ren & Guo, 2011). Given the complexity of their work, a critical characteristic that research suggests contributes to the level of middle manager performance is general mental ability, or g. While the relationship of g to performance is well established, it is surprising that more research has not focused on the relationship of g to *managerial* performance, or to potential moderators of this relationship. In fact, we lack a well-accepted model that integrates g with critical personal characteristics as moderators that would provide guidance for future research, and provide practical guidance in the selection and development of middle managers. As such, the purpose of this study is to identify constructs that might be influential to managerial performance, and to integrate those constructs into a model that includes potential moderators on the relationship of g to managerial performance. This study contributes to the field of management in two ways. First, it contributes to current theory by identifying several key drivers of middle manager performance and integrating them into a theoretical model. Second, this study contributes to practice by proposing and testing an integrated model for selection and development of middle managers that incorporates constructs organizations can identify and develop to improve managerial performance.

Acknowledgments

I wish to gratefully acknowledge the assistance of my dissertation chair, Dr. Alan G. Walker for his support and advice throughout the entire dissertation process. His suggestions and direction have been invaluable. I wish to also thank Dr. Hubert S. Feild and Dr. Daniel J. Svyantek for their willingness to sit on my dissertation committee and provide helpful insights and suggestions to move the dissertation process forward, as well as Dr. Allison Jones-Farmer for her assistance and helpful insights.

Most importantly, I wish to thank my wife, Ana, and my children Alessandro, Analia, Erica, and Ethan, for their patient support throughout my entire Ph.D. program. Without their support, obtaining a Ph.D. would have never been possible.

Table of Contents

List of Tables

List of Figures

CHAPTER 1: INTRODUCTION

In today's complex business environment, effective managers are crucial for maximizing organizational effectiveness (Hansen & Wernerfelt, 1989; Reay, Golden-Biddle, & Germann, 2006; Rubin & Dierdorff, 2011; Sadler--Smith, Hampson, Chaston, & Badger, 2003). Indeed, virtually all organizations can benefit from effective managers because they bring unique qualities, skills, and characteristics to organizations that create and maintain competitive advantage (Fulmer, Gerhant, & Scott, 2003; Luthans & Youssef, 2004; Ren & Guo, 2011). Even very individualistic work, such as the work performed by attorneys or surgeons, is conducted in professional practice organizations where technical skills must be complemented by management skills and ability (Sayles, 1979). In the end, the success of any organization is usually tied to the effectiveness of its managers and thus the selection and development of managers should be of paramount concern to organizational leaders (Longenecker & Fink, 2001).

For organizations to select and develop effective managers, answers to at least three fundamental questions seem relevant, namely, "What is a manager?" "What do managers do?" and "What makes a manager a high performer?" In answer to the question "What is a manager," Robbins and Coulter (2008) and Rost (1991) have suggested that a manager is anyone with the formal authority to coordinate and oversee the work of someone else for the purpose of accomplishing some organizational goal, such as producing and selling a product or service. Thus, the term "manager" is applicable to any individual appointed to coordinate the work of others, from the first level supervisor to the CEO.

1

In answer to the question "What do managers do?" a manager's primary responsibilities involve the creation of routines that help the organization function as a cohesive unit to enhance organizational effectiveness (Sayles, 1979). Functionally, managerial work has typically involved planning and budgeting, organizing, staffing, controlling, and problem-solving (Kotter, 1999), though these functions may be performed at varying degrees depending on the manager's organizational level. The day-to-day objective of a manager is thus to produce some degree of stability and order in an otherwise chaotic work environment (Kotter, 1990).

A logical follow-up question is "How is a manager different from a leader?" Early management research seems to use the terms "leader" and "manager" interchangeably, and thus no clear distinction was made. In the last few decades, however, some writers have made this distinction, suggesting that leadership "does the right thing" by articulating a vision and setting the direction of the organization in an environment of change, whereas management "does things right" by maintaining stability and directing the day-to-day operations (Bass & Stogdill, 1990; Katzenbach, 1997; Kotter, 1990). Whetton and Cameron (2010), however, suggest that the two functions are inseparable; in this day and age, one cannot be a good leader without being a good manager and vice versa. Mintzberg (1973) also acknowledges leadership as one of the roles of a manager. Consequently, differentiating between the two may be a matter of personal perspective rather than technical necessity. For the purposes of this dissertation, I adopt Mintzberg's approach by using the term "manager" while acknowledging that leadership is an important part of being a manager.

While responses to the questions of "what is a manager?" and "what do managers do?" are fairly simple to delineate, the question of "what makes a manager a high performer?" is more problematic and to some degree controversial (Andersen, 2006; Yukl, 2010). Reddin (1970)

emphatically supports the idea that performance must be defined in terms of output, such as measures of profitability. Others view managerial performance as the result of traits or behaviors (1949). Campbell(1970) suggested that a synthesis of these perspectives is more relevant to managerial performance. Still others suggest that managerial performance can be measured by how well a manager develops and manages critical relationships with individuals and groups (Chemers, 2002; Fraser & Zarkada-Fraser, 2003; Morse & Wagner, 1978). Finally, some have suggested that managerial performance is about making systematic decisions in uncertain environments (Georgiou, 2006).

Given the variability in defining what managers do and how to measure their performance, it can be quite complicated to identify high performing managers. Historically, at least three general approaches were used with varying degrees of success. The first major approach taken was a trait-based approach. Early work assumed that high performing managers were simply born that way, and so began the effort to examine what traits could be used to identify these managers. This approach met with little success, however, as researchers were relatively unsuccessful in establishing consistent relationships between manager traits and performance (Mann, 1959; Stogdill, 1948)[1].

Another approach utilized to identify high performing managers is the behavioral approach. As Drucker (1967) states, "If effectiveness were a gift people were born with . . . we would be in bad shape," so efforts turned to identifying key managerial behaviors that result in high performing managers[2]. One of the earliest of these attempts to define management

---

[1] More recent work stimulated by the development of the Big Five typology of personality is supportive of trait-based approaches, resulting in a resurgence of interest of sorts (House & Aditya, 1997; Luthans, Avolio, Avey, & Norman, 2007).

[2] Much of the management research literature, particularly the early literature, uses the terms "performance" and "effectiveness" somewhat interchangeably. I have chosen to use the term performance throughout this manuscript, except where the term "effectiveness" is used in direct quotes or other appropriate statements.

behaviors was the functional view proposed by Henri Fayol (1949), in which he defines the five critical management functions of planning, organizing, commanding, coordinating, and controlling. Theoretically, one may determine managerial effectiveness by how well an individual can perform these functions. Despite numerous other approaches, the functional approach is still one of the more relevant ways to examine managerial performance (Carroll & Gillen, 1987), and continues to receive support in current research (Andersen, 2006; Derue, Nahrgang, Wellman, & Humphrey, 2011).

Another behavioral approach for understanding managerial performance is Mintzberg's (1973) role-based explanation. Based on the observations of five CEOs and their mail, Mintzberg discounted the basic managerial functions proposed by Fayol in favor of 10 roles. These roles included three interpersonal roles (figurehead, leader, and liaison), three informational roles (monitor, disseminator, and spokesman), and four decision-making roles (entrepreneur, disturbance handler, resource allocator, and negotiator). Mintzberg's approach to managerial performance continues to be taught in management education courses and is considered an important behavioral contribution.

Behaviors, however, are manifestations of underlying skills, and hence a third approach, a skills-based approach for understanding managerial performance, gained credibility. Katz (1974) proposed that high performing managers possess three primary skills: conceptual, human, and technical skills. This view finds some support in the literature. For example, Pavett (1983) asked 180 managers and executives from a variety of private service and manufacturing firms for their perceptions of the skills required for successful job performance. The conclusion from this study was that conceptual, human, technical, and political skills were perceived as relatively important to managerial job success depending on job level (i.e., middle-level manager, CEO).

However, human skills were important across all managerial levels. Shipper and Davy (2002)

conducted a study of 1,125 managers examining the relationships between managerial skills,

employee attitudes and managerial performance (as measured using a 4-item scale from the

Survey of Management Practices; Wilson & Wilson, 1991). They found that interactive skills

(encouraging upward communication and participation, facilitating the work of others, and

recognizing and rewarding good performance) and initiating skills (planning, time emphasis, and

control of details) were related to managerial performance. Thus, at least from a broad

perspective, it is clear from the literature that skills do have a relationship to managerial

performance.

These perspectives, however, while important in their own right, fall short of identifying

high performing managers because they give greater importance to one particular element of

performance at the expense of other elements (e.g., emphasizing traits while ignoring behaviors).

An initial attempt at a more integrative approach can be seen in the "competency model"

proposed by Boyatzis (1982). Boyatzis defines a competency as a characteristic of an individual

that enables high job performance, or alternatively any characteristic, behavior, and trait

necessary to perform the job effectively (Abraham, Karns, Shaw, & Mena, 2001). Boyatzis

enumerated 21 competencies related to managerial performance, and competencies have since

been widely adopted as measures of manager performance (Levenson, Van der Stede, & Cohen,

2006). Competencies, however, are not without their weaknesses when used as a measure of

performance. Issues arise particularly in the variability of definitions of a competency used

across organizations, which competencies are important for managerial performance, and unclear

and inconsistent norms for evaluating relative strengths and weaknesses for each competency

(Pulakos & O'Leary, 2011). These issues yield an inconsistent model (Mintzberg, 1994) that often fails to aid practitioners in the selection and development of high performing managers.

What seems to be rather obviously neglected in all of the approaches discussed thus far is the role cognitive ability plays in managerial performance. An ever-changing work environment coupled with changing skill sets and flattening organizations (Semadar, Robins, & Ferris, 2006), particularly in the service sector, has made the work of managers more diverse and complex than ever. Managers now find themselves dealing with two fundamental challenges in their work: determining what to do despite large amounts of uncertainty and potentially relevant information (Kotter, 1982), and accomplishing organizational goals through a large and diverse group of employees (Bass & Stogdill, 1990). Managers are now expected to perform their traditional duties of planning, organizing, commanding, coordinating, and controlling in increasingly complex and dynamic environments. Furthermore, managers are increasingly expected to perform non-traditional duties that are potentially even more cognitively demanding such as coaching, motivating and inspiring employees, and coordinating teamwork (Hogan, Curphy, & Hogan, 1994). In addition, managers are expected to do these duties in a fragmented and hectic environment requiring the ability to shift from one person to another and from one subject to another on a continuous basis (Mintzberg, 1973; Sayles, 1979). In essence, a model is needed that recognizes that effective managers are more than the traits and skills they possess; the modern manager must also have the "cognitive and behavioral capacity to recognize and react to paradox, contradiction, and complexity in their environments." (Denison, Hooijberg, & Quinn, 1995, p. 525).

Fundamentally, what is needed is a framework that (a) combines the various components of managerial performance into an integrated whole, (b) provides guidance for future research,

and (c) identifies useable tools for practitioners. Jaques and Cason (1994) proposed such a framework, one that recognizes the role of cognitive ability along with the influences of motivation, traits, and skills. This framework suggests that a manager's applied work capability (i.e., their ability to perform work tasks) is a function of a manager's level of complexity of mental processing (CMP, a measure of one's ability to deal with complexity), the extent to which they are interested and/or committed to managerial work, and the extent to which a person possesses managerial skills. In addition, they propose that a manager's work capability will be negatively influenced by negative personality characteristics (i.e., low self-esteem or high neuroticism).

Using the Jaques and Cason model as a theoretical framework, the purpose of this study is to test a model of managerial performance that incorporates the elements of cognitive ability, personality, motivation, and managerial skills. A study of this nature contributes to theory and practice in a number of ways. Foremost, while a number of studies have looked at each of these variables as predictors of managerial performance independent from one another, this study integrates these components into one framework and proposes to test them simultaneously. Investigating these components together provides the opportunity to examine the effects of the combined elements, yielding better understanding of the possible interactive effects of the various components. Ackerman and Heggestad (1997), in their meta-analysis of the relationships between intelligence, personality, and interests, made significant strides in this direction, but more work is needed in this area (Tenopyr, 2002), particularly on alternative non-cognitive predictors that may provide incremental validity over that of cognitive ability (Goldstein, Zedeck, & Goldstein, 2002).

7

Additionally, this study contributes to theory and practice by integrating personality, skills, and state-based motivation into a more complete model that may provide direction for future research and clues as to who might be best qualified for management positions and who might be most successful in management endeavors. The identification of managers that possess the qualities most likely to maximize performance is of particular importance to practitioners for both selection and development purposes.

In sum, managerial performance is a critical factor contributing to organizational performance and should be of concern to both academic researchers and human resource professionals engaged in the selection and development of managers (Carroll & Gillen, 1987). In particular, changes from a manufacturing to service economy are requiring managers to have increasing levels of capability in order to be effective (Hogan et al., 1994). Managers that lack the complexity of mental processing to work in the managerial environment of today's organizations are not likely to be successful. Further, even with adequate cognitive ability, lack of motivation and skills, as well as personality characteristics may handicap overall effectiveness. Thus, having a more integrated view of overall managerial performance may be helpful both at the individual level (by allowing them to be successful through good fit, or avoiding unnecessary failure due to poor fit) and the organization level (by obtaining a competent and effective manager).

CHAPTER 2: LITERATURE REVIEW AND HYPOTHESES

The Model

The proposed model (see Figure 1) has at its foundation the construct of complexity of mental processing (CMP). That is, as proposed, CMP serves as the primary predictor of managerial performance. While CMP is critical in predicting managerial performance, it is not the only predictor. Based on the proposed model, the CMP $\rightarrow$ Performance relationship is moderated by three other variables: (a) managerial skills, (b) managerial motivation, and (c) negative personality traits. With this model in mind, after a brief discussion of managerial performance, I will discuss how CMP might relate to performance, followed by how the three moderating components of personality, motivation, and skills may influence the CMP $\rightarrow$ Performance relationship.

Managerial Performance

Job performance is a central theme in industrial/organizational psychology and management research (Viswesvaran & Ones, 2000), and managerial job performance is particularly important because managers have the ability to directly influence the organization's culture and productivity (Young, Arthur, & Finch, 2000). However, agreement concerning what constitutes managerial performance is lacking.

Figure 1: *Hypothesized Model*
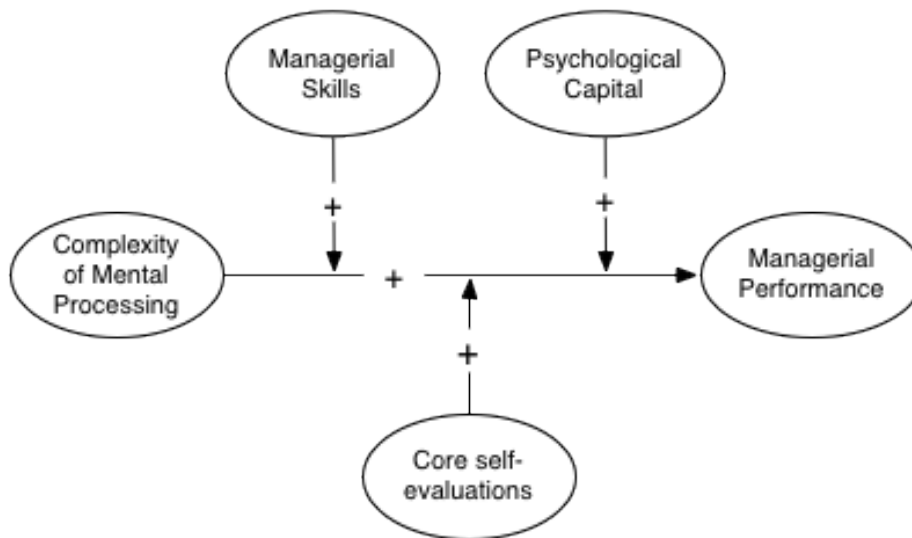
Defining managerial performance is somewhat problematic. There is a vast amount of literature on this topic, but no single source has identified a singular method of evaluation. Rather, the measure of performance reflects what the researcher believes coincides with their concept of management (Yukl, 2010). Nonetheless, Campbell, Dunnette, Lawler, and Weick (1970) provide a useful definition of managerial performance in terms of behaviors that optimize organizational functioning. They define managerial performance as, " . . . any set of managerial actions believed to be optimal for identifying, assimilating, and utilizing both internal and external resources toward sustaining, over the long term, the function of the organizational unit for which a manager has some degree of responsibility" (1970, p. 105). Past research has identified a number of actions and behaviors that contribute to managerial performance that can be grouped generally as task and contextual performance factors (Oh & Berry, 2009). These groupings have resulted in a number of taxonomies of managerial performance.

For example, Luthans (1988) identified a number of factors, along with relevant behaviors, that contribute to managerial performance. These include: (a) communication behaviors (e.g., exchanging routine and non-routine information via face-to-face, phone, e-mail, and memos), (b) traditional management behaviors (e.g., setting goals, defining tasks, scheduling employees, assigning tasks, handling day-to-day operational crises, monitoring performance data), (c) human resource management behaviors (e.g., allocating formal rewards, resolving conflict between subordinates, developing job descriptions, reviewing applications, interviewing applicants, orienting employees, arranging for training, clarifying roles, coaching, mentoring), and (d) networking behaviors (e.g., establishing and utilizing relationships with other managers, clients, and vendors, attending external meetings, and doing/attending community service).

Borman and Brush (1993) used a panel of five Industrial/Organizational psychologists to classify 187 different performance dimensions collected from 26 published and unpublished studies that employed critical incidents or other behavioral-related analyses of managerial performance. Their analysis resulted in a taxonomy consisting of 18 factors comprised of an overarching structure of four groupings: (a) interpersonal dealings and communication, (b) leadership and supervision, (c) technical activities and the "mechanics of management," and (d) useful personal behavior and skills. The dimensions derived in their study were inclusive of most of the dimensions developed in several earlier taxonomies (e.g., Hemphill, 1959; Tornow & Pinto, 1976; Yukl, 1987).

As part of a more recent study, Dierdorff, Rubin, and Morgeson (2009) identified a number of managerial activities using archival data provided by the U.S. Department of Labor for the Occupational Information Network (O*NET). These data consisted of 8,633 respondents spanning 52 managerial occupations responding to a 41-item generalized work activities

questionnaire developed for O*NET (Hubbard et al., 2000). From this analysis, they determined a six-factor structure of managerial activities, consisting of Managing Human Capital, Managing Logistics and Technology, Managing Decision-making Processes, Managing Strategy and Innovation, Managing the Task Environment, and Managing Administration and Control. These dimensions, though not identical, seem to be consistent with the Luthans (1988) and Borman and Brush (1993) taxonomies.

Thus, based on the review of the literature presented, there appears to be some level of consistency regarding the broader behaviors/activities associated with managerial performance. In sum, it appears that for managers to be high performers they must produce output that meets both the quantity and quality requirements of the organization, and they must accomplish this through other people (Luthans, 1988).

Complexity of Mental Processing

As noted previously, the complexity involved with managerial work is increasing in today's workplace, requiring managers to possess sufficient mental capability to perform their job (Denison et al., 1995). Jaques and Cason (1994) label this mental capability "complexity of mental processing" (CMP) and define CMP as the ability of an individual to exercise mental processes in order to solve problems related to accomplishing a task. CMP is a component of an individual's makeup not influenced by environment, culture, education, the type of work we do, or the content of any given role. Jaques and Cason state that CMP is likely the psychological construct of general mental ability (or g, Spearman, 1904). As conceptualized today, g is a general ability to process complex information of any type, or in other words, to deal effectively with complexity (Gottfredson, 2002), which as noted earlier, is a critical aspect of managerial work.

A large body of evidence supports the influential role of g as a predictor of both current and future job performance (Ree & Carretta, 2002). A number of meta-analyses have demonstrated the predictive strength of g on job performance. For example, Hunter and Hunter (1984) found that across a broad range of job families, the relationship between g and job performance had a mean true correlation of .45. Schmidt and Hunter (1998) assessed the utility of g and 18 other selection methods on job and training performance. The predictive validity of g for job performance was .51, and for training performance was .56. Only work sample tests were more predictive of job performance ($r = .54$), and no other single selection method was more predictive of training performance. The predictive validity of g also increases as the complexity of the job increases, as Hunter (1983) demonstrated in a test of g against 515 occupations classified as either low ($r = .40$), medium ($r = .51$), or high ($r = .58$) complexity jobs. In essence, no single non-cognitive trait or interest predicts core performance better (Furnham, 2008). Individuals high in g learn more and learn faster, and unlike other characteristics, such as job experience, the influence of g does not decrease over time (Gottfredson, 2002).

Since its original conception as a single general factor (Spearman, 1904), however, g has evolved into a multi-faceted construct consisting of a number of "intelligences," such as fluid intelligence, crystallized intelligence, general memory and learning, and processing speed, among others (Ployhart, Schneider, & Schmitt, 2006). While there remains some debate as to the multi-faceted nature of g, it is plausible that if g is not a single factor, it may best be represented by a two-factor structure, namely crystallized and fluid intelligence (Cattell, 1941). Crystallized intelligence includes abilities that are acquired over time through experience, learning, and acculturation, such as language development, reading comprehension, spelling ability, foreign language ability, and verbal ability (Carroll, 1993).

More pertinent to this study is the facet of fluid intelligence. Fluid intelligence is defined as the capacity to "perceive relations and deduce correlates" (Cattell, 1941, p. 5), or in other words, the capacity to deal with complexity. Examples of factors considered part of fluid intelligence include general sequential reasoning, qualitative reasoning, and speed of reasoning (Carroll, 1993). It is this facet that is most closely related to the Complexity of Mental Processing construct proposed by Jaques and Cason (1994), and is most relevant to the work of managers. Given the overlap in the definitions of *g*, fluid intelligence, and complexity of mental processing, and the amount of evidence that connects *g* to greater performance, I will use the terms interchangeably, with a preference for CMP, and hypothesize the following:

> *Hypothesis 1:* Complexity of mental processing (CMP) will positively relate to managerial performance; those who score higher on CMP will perform better than managers scoring lower.

Personality

Jaques and Cason (1994) suggest that personality has little bearing on performance, except in the case where a person's negative personality traits can diminish effectiveness. Research on personality and performance would seem to both contradict and support this assertion. For example, a number of studies (Dudley, Orvis, Lebiecki, & Cortina, 2006; Hogan & Holland, 2003; Mount, Barrick, & Stewart, 1998; Oh & Berry, 2009) have found significant relationships between various dimensions of personality and job performance. Effect sizes, however, are often small. For example, in a meta-analysis of 11 studies, Mount, Barrick, and Stewart (1998) found true estimated mean correlations for the Big Five personality dimensions of Conscientiousness, Emotional Stability, Agreeableness, Extraversion, and Openness to Experience as predictors of overall job performance to be .26, .18, .21, .14, and .17, respectively.

Hurtz and Donovan (2000) reported similar results and state that the validities of the Big Five as predictors of performance tend to be low to moderate. These results seem supportive of Jaques and Casons' argument that, with the notable exception of conscientiousness, personality may have little bearing on performance, as evidenced by the large amount of unexplained variance.

Direct effects of personality on job performance may be misleading, however, for two reasons. First, isolated traits may not adequately capture enough variance of the entire conceptual space in personality to be valid predictors of job performance. For example, self esteem is frequently considered important for job performance, but Baumeister, Campbell, Krueger, and Volts (2003), in a review of the literature on self-esteem, state that there is no evidence that self-esteem predicts job or task performance. Second, many traits have significant overlap with other traits. For these reasons, the use of a latent model higher order construct may capture more of the personality-related conceptual space resulting in unifying constructs that better explain and predict job performance (Johnson, Rosen, & Levy, 2008). A latent model higher order construct consists of several first-level latent variables that have a latent commonality among them (Law, Wong, & Mobley, 1998), and thus overcomes the two weaknesses previously mentioned (i.e., individual traits are insufficient because they do not capture enough of the conceptual space to predict job performance, and individual traits are insufficient because they are highly correlated). A good example of a higher order personality trait that seeks to overcome these limitations, and the one used in this study, is the trait of core self-evaluations (CSE; Judge, Locke, & Durham, 1997).

CSE is a higher-order, trait-based personality construct comprised of four facets: self-efficacy, self-esteem, locus of control, and neuroticism. As a construct, CSE is designed to reflect an appraisal of one's self-worth and beliefs in their abilities to succeed (Judge, 2009).

Studies have confirmed the stability of these variables as common underlying traits of a higher order trait (Dormann, Fay, Zapf, & Frese, 2006; Judge & Bono, 2001), and demonstrated that CSE is consistently a better predictor than the four isolated traits (Erez & Judge, 2001). Each of these facets has significant bearing on the work of a manager. A manager high in self-efficacy (i.e., feelings of ability to be successful) combined with high self-esteem (i.e., feelings of self-worth) may be more likely to feel confident in their abilities to handle the complexities inherent in managerial work. A manager low in neuroticism (i.e., free from anxiety, depression, anger, emotional instability, insecurity, nervousness, fearfulness, or apprehension), might develop better relationships faster and be more effective at garnering the trust, cooperation, and support of others. A manager high in internal locus of control might be more likely to take personal responsibility for the outcomes over which they are responsible. In general, we would expect that managers high in CSE would have greater levels of effectiveness than managers would with lower levels of CSE.

Evidence does seem to support these expectations. CSE has been shown to have a direct effect on higher task performance in a laboratory setting, and higher job performance among sales representatives (Bono & Judge, 2003), though this linkage is modest ($r = .23$). The weak but statistically significant relationship of personality, and CSE in particular, with performance, suggests that CSE may also be a meaningful moderator of some relationships. A study by Harris, Harvey, and Kacmar (2009) found that CSE was a moderator on the relationship of social stressors to both job satisfaction and turnover intentions, confirming the moderating ability of CSE though not directly on job performance. For this study, I also expect CSE to act as a moderator, moderating the CMP $\rightarrow$ Managerial performance relationship more so than a direct relationship of CSE to performance might produce. If Jaques and Cason are correct in their

assertions, CSE's moderating role would imply that when CSE is high, there should be little or no effect on the correlation between CMP and performance (since, in their model, they only consider the possibility that personality will negatively impact performance). However, when CSE is low the correlation between CMP and performance will be lower than for managers with high CSE.

Hypothesis 2: Core self-evaluations (CSE) will moderate the relationship between Complexity of Mental Processing (CMP) and managerial performance such that the relationship will be weaker for managers low in CSE than for managers high in CSE.

Motivation

A second influence on the CMP → Performance relationship involves the commitment of the manager to performing required duties. In other words, how motivated is an individual to fulfill the responsibilities of a manager? Managers are consistently confronted with a number of discretionary activities in the course of their duties suggesting that intrinsic motivation to fulfill their responsibilities will result in higher levels of effort and persistence (Meyer, Becker, & Vandenberghe, 2004). Traits, in particular, can be a significant source of intrinsic motivation, such as those posited by the theory of needs (i.e., need for achievement, need for power, and need for affiliation; McClelland, 1967; McClelland & Burnham, 2003; Stahl, 1983). Traits, however, are by definition generally stable and difficult to change. If organizations must rely on individuals possessing adequate levels of a motivational trait to fill management positions, they may be severely limited in the selection options, resulting in essential positions remaining unfilled. Other psychological characteristics, however, are more "state-like." That is, they are relatively malleable and open to development (Luthans et al., 2007). These state-based motivational constructs may be more useful to organizations because these constructs can be

cultivated in most managers, including those that do not possess especially high levels of motivational traits.

Psychological Capital (PsyCap; Luthans & Youssef, 2004) is just such a state-based construct of motivation originating in the positive organizational behavior (POB) movement. According to Luthans, Youssef, and Avolio (2007), this construct is composed of four facets: (a) self-efficacy, having the confidence to take on challenging tasks and put in the effort to succeed; (b) optimism, believing one can succeed now and in the future; (c) hope, having the will to succeed and the ability to identify, clarify, and pursue the way to success; and (d) resiliency, the ability to bounce back from adversity to attain success. PsyCap, taken as a whole, "represents one's positive appraisal of circumstances and probability for success based on motivated effort and perseverance" (Luthans et al., 2007, p. 551).

Previous research has linked each of the four facets to positive job attitudes and performance. For example, self-efficacy has been linked to better leadership under stress (Murphy, 1992) and to higher levels of motivation (Gist & Mitchell, 1992). Optimism has been linked with the ability to better cope with stressors that occur while working toward higher levels of performance (Scheier, Weintraub, & Carver, 1986). Likewise, both hope and resiliency have been empirically correlated to performance (Adams et al., 2002; Luthans, Avolio, Walumbwa, & Li, 2005). As a latent model higher order construct, PsyCap has demonstrated both theoretically and empirically that it predicts job performance better than each of the four independent facets of which it is comprised (Avey, Luthans, Smith, & Palmer, 2010).

A key distinguishing factor between PsyCap and other latent model higher order constructs, such as core self-evaluations, is that PsyCap is conceptualized to be state-like and malleable, and thus developable (Stajkovic, 2006; Walumbwa, Peterson, Avolio, & Hartnell,

2010). For example, a recent study has demonstrated that psychological capital can be increased through a Web-based training intervention (Luthans, Avey, & Patera, 2008). This seems conceptually consistent with the fact that each of its four facets is both trait- and state-like and has been demonstrated empirically to be open to development (Luthans et al., 2007). Initial evidence also suggests that the construct of PsyCap is distinct from trait-based constructs such as core self-evaluations and the Big Five personality traits (Luthans et al., 2007).

The potential practicality and intuitive appeal of PsyCap is apparent given that managers are often assigned a variety of tasks that may have a high risk of failure. Even managers high in CMP may be daunted in the face of some assignments. I propose that managers with high levels of PsyCap will be rated as better performers due to stronger beliefs about their abilities to complete the task (self-efficacy), having a vision of completion (hope), approaching their responsibilities from a positive perspective (optimism), and when things go awry, bouncing back more quickly (resiliency). Thus, I propose that PsyCap will moderate the relationship between CMP and managerial performance such that the correlation will be higher for those managers high in PsyCap than for those managers low in PsyCap.

> *Hypotheses 3:* Psychological Capital will moderate the relationship between Complexity of Mental Processing (CMP) and managerial performance such that the relationship will be stronger for managers high in Psychological Capital than for managers with lower levels of Psychological Capital.

Managerial Skills

A final moderating variable of the model is related to a manager's skills, defined by Mumford, Peterson, and Childs (1999) as procedures for acquiring and working with information. Mumford et al. differentiate skills from traits such as personality or core self-

evaluations in that they are not necessarily stable but depend on experience and practice (Mumford, Peterson, & Childs, 1999). Of particular value for managers are skills necessary for accomplishing work *through* others, which is the essence of managerial work.

For example, Luthans, Rosenkrantz, and Hennessey (1985) found that managers high in skills such as managing conflict, decision-making, communicating with internal organizational members, and planning and goal setting were rated as more successful (i.e., number of promotions within the organization per month or per year) than managers not possessing these skills. Curtis, Winsor, and Stephens (1989) found that skills necessary for managerial success included interpersonal skills, verbal and written communication skills, and technical competence among others. Van Velsor and Britain (1995) identified several skills that when lacking cause managers to derail (cease upward advancement due to misfit between job requirements and skills), including lack of interpersonal skills, inability to build and lead a team, and inability to adapt.

In a qualitative study, Whetten and Cameron (2010) identified 402 managers considered highly effective performers and interviewed them to find out what skills contributed to their success. Their analysis revealed 10 critical skills cited most frequently. These 10 skills include verbal communication, managing time and personal stress, managing individual decisions, recognizing, defining, and solving problems, motivating others, delegating, setting goals and articulating a vision, self-awareness, building effective teams, and managing conflict.

These findings have significant overlap with the skills identified by Mumford, Campion, and Morgeson (2007). Mumford et al. asked 1,023 junior, mid-level, and senior U.S. government employees across five different career specialties to rate the skills necessary for leadership positions using the skills rating questionnaire developed by the U.S. Department of Labor for the

Occupational Information Network (O*NET; Mumford et al., 1999). Their findings supported a four-factor skill structure consisting of cognitive skills (i.e., speaking, writing, critical thinking, etc.), interpersonal skills (i.e., social perceptiveness, coordination, etc.), business skills (i.e., managing personnel, financial, and material resources), and strategic skills (i.e., visioning, problem identification, solution appraisal, etc.). It is this set of skills, identified by Mumford et al., which, for the purposes of this study, I will utilize. That is, these are the skills that are most useful to managers in dealing with the complexities of managerial work and which are necessary for accomplishing work through others. As Jaques and Cason (1994) acknowledge, skills can be an important moderator on the CMP → Managerial performance relationship. I propose that the correlation between CMP and performance will be higher for managers high in managerial skills than for managers low in managerial skills.

> *Hypothesis 4:* Managerial skills will moderate the relationship between Complexity of Mental Processing (CMP) and managerial performance such that the relationship will be stronger for managers high in managerial skills than for those managers with lower levels of managerial skills.

CHAPTER 3: METHOD

Research Setting and Procedures

The target population of this study was middle managers. Traditionally, middle managers are those who have first-line managers/supervisors that report to them and who in turn report to a manager above them in the hierarchy (Robbins & Coulter, 2008). Today's organizations, however, tend to be more decentralized and flatter, and thus may include some first-line managers/supervisors that have broader roles (Hardt, 1997; De Jong, Leenders, & Thijssen, 1999). This population is in the unique position of having to take demands and goals from upper-level executives and translate them to operational objectives for line personnel. In turn, they must take performance data and filter it back to the executive level. Thus, the unique positioning of middle managers makes them a critical component in organizational performance (King, Fowler, & Zeithaml, 2001; Ren & Guo, 2011), and requires them to deal with high levels of job complexity, making them an ideal target for this study.

Acquiring an organization sufficiently large to provide adequate manager response proved challenging and in the end required a pool of data from two different sources. The first source, and the source from which the majority of the data were collected, was a facilities maintenance organization for a large university in the southeastern United States. A smaller sample of data (less than 12% of the total sample) was collected from employees from the veterinary services' clinic within the same university and combined with the facilities maintenance data during analysis. Data were collected from the veterinary clinic over

approximately a two-month period in early 2012. Data from the facilities' maintenance group were collected over a three-month period in the summer of 2012.

To facilitate the data collection, online surveys were created and administered to three constituencies within each organization: (a) managers (ratee), (b) the managers' supervisors (boss), and (c) the mangers' subordinates. For the purposes of this study, a manager was defined as any individual with the formal authority to perform performance evaluations for any number of subordinates. The resulting sample consisted of a range of managers including assistant supervisors, supervisors, assistant managers, managers, assistant directors, and directors. As previously stated, the flatter nature of organizations and the subsequent delegation of many managerial tasks to lower levels of the managerial hierarchy justified the inclusion of each of these managerial categories.

The purpose of each survey was to gather information about one specific manager. In order to accomplish this purpose, respondents were required to provide the name of the manager being rated. The manager's name was used to provide a link between the responses of the manager, the manager's boss, and any of the manager's subordinates that responded. Given the potential sensitivity of the responses and to protect the anonymity of the manager, once the data collection process was complete all names were replaced with a unique numerical identifier. This served to eliminate any manager identity from the data set, yielding the data completely anonymous.

Employees were provided a link to a master webpage containing a list of web links and descriptions for each of the three surveys. From this master page, employees clicked on the link for the survey in which they desired to participate. The survey opened in a new web page. Once complete, the respondents simply closed the browser window in which they took the survey and

were returned to the master webpage. Respondents could then complete additional surveys as needed. Taking additional surveys might be necessary, for example, when a manager may respond for him- or herself to the manager survey, and because they were subordinate to a director, they may have needed to respond to the subordinate survey regarding the performance of their manager. Additionally, if a manager had managerial employees under them, they were asked to rate those employees' skills.

To facilitate administration of the surveys, all employees were allowed to complete the surveys on work time and at computers within their work area. This was particularly important to the success of the data collection process as many of the employees lacked sufficient resources to complete the surveys outside of the work environment. A number of individuals, however, did not have ready access to computers in their work area and/or needed assistance with the technology. To address this issue, I provided several survey administration opportunities at a computer lab located outside of the respondent's main work areas and free of supervisor oversight. All survey participants that utilized the lab site used the same web-based surveys as other participants.

Managers participated in a test of cognitive ability, and provided self-reports of core self-evaluations, and psychological capital. Given the nature of these constructs, self-report data were the logical source. The manager's supervisor provided measures of the manager's skills. Since research suggests that self-reports tend to be inflated in comparison to supervisory ratings (Heidemeier & Moser, 2009), acquiring a skill rating from the ratee's manager reduced concerns of inflated self-ratings.

Subordinates were asked to provide a measure of the manager's performance. As previously argued, given the multi-level nature of managerial work, certain behaviors are more

readily observed by the subordinates, and thus subordinates constitute an important source for rating relevant managerial performance behaviors (Mount, 1984; Tsui & Ohlott, 1988).

Sample

Survey invitations were extended to all managers who fit the managerial criteria ($n = 82$), their subordinates ($n = 469$), and the manager's bosses ($n = 27$; most rated more than one manager) inviting them to participate in a survey to assist with a study of managerial performance. At the conclusion of the data collection period, I received 83 manager responses, 83 manager skills ratings from 26 bosses, and 329 subordinate responses. It was initially unclear why more manager and boss responses were received than solicited. To investigate this issue and to render the data anonymous, I assigned each manager who was solicited to participate a unique numerical identifier and used that identifier to recode the managers' names. After recoding the names, some responses remained un-coded. In a few cases, a boss inappropriately rated a subordinate as a manager, which explained why more manager responses were received than solicited. In other instances, an individual was identified as a manager who was not a manager, explaining the over-response of managers. After removing 13 cases of this nature, along with 5 cases of incomplete or blank responses from the dataset, I retained 81 manager responses, 78 boss responses, and 318 subordinate responses.

The second issue that needed to be resolved was to match all the data across each of the three response sets. For each manager, there must be a complete self-rating, a complete boss rating, and sufficient subordinate ratings (3 or more; see the section "Method of Analysis" below for more information on why this number was chosen) to justify an analysis. After deleting 11 manager responses, eight boss ratings, and 18 subordinate ratings that did not have corresponding matches in one or both of the other response sets, I retained a total of 70 complete

matches [n(manager) = 70; n(boss) = 70; n(subordinate) = 300; N = 440]. Of the complete

matched sets, 61 sets (87.1%) had three or more complete subordinate ratings for each manager.

In the nine situations where subordinate ratings were less than three, six of these managers had

fewer than three subordinates but 100% of the subordinates responded, so these cases were

retained. In the remaining three situations, I acquired two subordinate responses for each

manager; I retained these as well. After the dataset was purged of unusable data as described

above, the overall response rate for managers was 84.37%, and the response rate for subordinates

was 63.97%).

Approximately half of the responses from managers came from assistant supervisors or

supervisors. Most manager respondents were male (80.0%), and most were 41 years old or older

(81.5%). Many of the managers responding had a 4-year (Bachelor's) degree or higher (45.7%),

had been with their organization for 11 or more years (62.9%) and had been in their position 3 or

more years (65.7%). Subordinate characteristics were somewhat similar. A majority was male

(68.3%), over the age of 40 (63.4%), and had been in their respective position 3 or more years

(68%). Organizational tenure was a bit lower in the subordinate sample, with a majority residing

with their organization 3 or more years (76%). Education levels among subordinates tended to be

clustered around 2-yr (Associate's) degrees, technical certificates, and high school diplomas

(71.0%), with the majority (38%) possessing only a high school diploma. Table 1 (see below)

presents a detailed breakdown of the respondent characteristics.

Table 1: *Respondent Characteristics*

Characteristics - Manager	*n*	*%*	Characteristics - Subordinates	*n*	*%*
Gender			Gender		
Male	56	80.0	Male	205	68.3
Female	14	20.0	Female	87	29.0
Age (in years; Mean=33.6, SD = 6.5)			Age (in years; Mean=33.6, SD = 6.5)		
20-25	1	1.4	20-25	12	4.0
26-30	1	1.4	26-30	21	7.0
31-35	4	5.7	31-35	26	8.7
36-40	5	7.1	36-40	35	11.7
41-45	17	24.3	41-45	47	15.7
46-50	13	18.6	46-50	54	18.0
>50	27	38.6	>50	89	29.7
No Response	2	2.9	No Response	16	5.3
Education Level			Education Level		
Less Than High School Diploma	0	0.0	Less Than High School Diploma	10	3.3
High School Diploma	18	25.7	High School Diploma	114	38.0
Technical Degree/Certificate	12	17.1	Technical Degree/Certificate	62	20.7
Associates Degree	8	11.4	2-yr (Associate) Degree	37	12.3
4-yr (Bachelors) Degree	25	35.7	4-yr (Bachelor) Degree	58	19.3
Masters Degree	6	8.6	Masters Degree	14	4.7
Doctorate Degree	1	1.4	Doctorate Degree	2	0.7
No Response	0	0.0	No Response	3	1.0
Organizational Tenure			Organizational Tenure		
Less Than 1year	5	7.1	Less Than 1year	22	7.3
1-2 years	1	1.4	1-2 years	45	15.0
3-5 years	2	2.9	3-5 years	67	22.3
6-10 years	17	24.3	6-10 years	65	21.7
11 or more years	44	62.9	11 or more years	96	32.0
No Response	1	1.4	No Response	5	1.7
Organizational Position			Position Tenure		
Asst. Supervisor/Supervisor	35	50.0	Less Than 1year	34	11.3
Asst. Manager	12	17.1	1-2 years	57	19.0
Manager	9	12.9	3-5 years	84	28.0
Asst. Director	5	7.1	6-10 years	59	19.7
Director	8	11.4	11 or more years	61	20.3
No Response	1	1.4	No Response	5	1.7
Position Tenure					
Less Than 1year	8	11.4			
1-2 years	15	21.4			
3-5 years	14	20.0			
6-10 years	14	20.0			
11 or more years	18	25.7			
No Response	1	1.4			

Note. N = 370; *n*(manager) = 70; *n*(subordinate) = 300.

27

Measures

Complexity of mental processing (CMP). To measure CMP of the manager, I used a short version of the Raven's Advanced Progressive Matrices (APM; Raven, Court, & Raven, 1978). The full Raven's APM is a widely used measure of *g* or fluid intelligence (Bors & Stokes, 1998; Carpenter, Just, & Shell, 1990) said by some to be the purest measure of fluid intelligence (Day, Arthur Jr, & Gettman, 2001). Further, because it is a non-verbal test of intelligence it is generally considered culture-neutral (Arthur & Day, 1994) and not susceptible to differences in reading ability (McKay, Doverspike, Bowen-Hilton, & Martin, 2002). The test was designed to measure the ability of respondents to solve problems and handle complexity through progressively more complex puzzles (Carpenter et al., 1990; Raven, 2000). The full test consists of 12 practice items and 36 test items. Each item is a puzzle with one missing part at the end. The respondent is asked to pick which of eight options best completes the puzzle. The test is designed to become increasingly difficult as the respondent moves through the items.

The full test generally takes about 40 minutes to complete, which was of particular concern for this study. Having a shorter version of the test would be of practical value in an organizational setting. At least two studies have sought to create a short version of the test (Arthur & Day, 1994; Bors & Stokes, 1998). Arthur and Day (1994) created a short form that obtained a correlation of .90 with the full-length APM, and the Bors and Stokes' (1998) version obtained a correlation of .92 with the full-length APM and an internal consistency (as measured by Cronbach's alpha) for the 12-items of .73.

For this study, I used the short version of the Raven's APM outlined by Bors and Stokes' (1998). The test was administered by providing each manager with a test booklet consisting of two practice puzzles and 12 scored puzzles. Scores were obtained by calculating the total number

of correct responses on each of the 12 scored puzzles, with a higher score indicative of greater CMP. The proprietary nature of this measure prevents the reproduction of any test item, however, an item similar to the actual test items (retrieved from http://www.iqtest.dk/main.swf) appears in *Appendix 1: Measures*. Coefficient alpha for the measure as used in this study was .82 (M = 5.91; SD = 3.2).

   Core self-evaluations. Core self-evaluations was self-reported by managers using the 12-item Core Self-evaluations Scale (CSES; Judge, Erez, Bono, & Thoresen, 2003). CSE is designed to reflect an appraisal of one's self-worth and beliefs in their abilities to succeed(Judge, 2009). This scale has shown internal consistencies across a number of studies in the range of .80-.84 (Judge, Van Vianen, & De Pater, 2004; Kacmar, Collins, Harris, & Judge, 2009; Stumpp, Hulsheger, Muck, & Maier, 2009). The complete scale is included in *Appendix 1: Measures*. Each item was rated using a 6-point Likert type scale (1 = Strongly Disagree, 6 = Strongly Agree). Coefficient alpha for this study was .74 (M = 4.66; SD = .54).

   Psychological capital. Psychological capital was self-reported by each manager using the 24-item Psychological Capital Questionnaire (PCQ-24; Luthans et al., 2007). The scale purports to measure the level of a manager's state-based self-efficacy, optimism, hope, and resiliency. This scale is relatively new, but has been used in a number of studies. In a validation study of the scale, Luthans et al. (2007) found internal consistencies across multiple studies to be greater than .85, and reliabilities for other studies have ranged from .93 (Avey et al., 2010) to .98 (Peterson, Luthans, Avolio, Walumbwa, & Zhang, 2011). The full scale is included in *Appendix 1: Measures*. Each item was rated using a 6-point Likert type scale (1=Strongly Disagree, 6=Strongly Agree). Coefficient alpha for this study was .88. (M = 4.93; SD = .47).

Managerial skills. The ratings of managerial skills was reported by the manager's

supervisor using 20 items from the generalized work skills questionnaire provided by the U.S.

Department of Labor for the Occupational Information Network (O*NET;

https://onet.rti.org/pdf/OE_Skills_Questionnaire.pdf). The original version of this scale was a 46-

item measure originally developed by Mumford, Peterson, and Childs (1999) that measures both

the level of the particular skill needed for the job, and the importance of that skill to the job. To

determine which of the skills were related to leadership, Mumford et al. (2007) factor-analyzed

the 46 items and determined that leadership skills were best represented by a four-factor structure

consisting of 21 of the 46 items. These items were grouped into four factors: cognitive skills ($\alpha =$

.90), interpersonal skills ($\alpha = .84$), business skills ($\alpha = .75$), and strategic skills ($\alpha = .91$).

In 2000, the scale was updated and revised resulting in the 35-item measure currently in

use (Hubbard et al., 2000). The revised version of the questionnaire merged six of the original 46

skills identified by Mumford et al. into a single skill (complex problem solving), eliminated

several outdated skills previously identified, and added a number of other managerial related

skills not previously included. A factor analysis of the revised edition of the scale identifying

leadership skills was not available, so in selecting the skills considered most relevant to

managerial work, I selected the 15 skills identified by Mumford et al. that remained in the

revised version of the questionnaire, the one skill that was created by merging six skills used in

the Mumford et al. study (complex problem solving), and four others from the new questionnaire

that seem particularly relevant to managerial work based on previous research (i.e., time

management, quality control analysis, judgment and decision-making, systems analysis;

Boyatzis, 1982; Campbell, 1970; Mintzberg, 1994). The scale is designed to assess the overall

level of managerial skills as perceived by the manager's boss. The manager's bosses' were given

the statement, "[Name of manager] does very well at . . ." followed by the 20 statements reflecting the skills selected, such as "Talking to others to convey information effectively" or "Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems." Each item was rated on a 7-point Likert type scale (0=Not Sure/Does Not Apply; 1=Strongly Disagree; 2=Disagree; 3=Somewhat Disagree; 4=Somewhat Agree; 5=Agree; 6=Strongly Agree). The full scale is included in *Appendix 1: Measures*. Scores were calculated by taking the average of all 20 ratings. Coefficient alpha for this study was .93 (M = 4.89; SD = .7).

Managerial performance. Rating managerial performance raised two questions: "Who should rate the manager? and "How should the manager be rated?" Traditional performance management systems usually acquire ratings from immediate supervisors as the only raters of a managers' performance (Facteau & Craig, 2001), but today, subordinates of managers are increasingly used to rate their managers (Conway & Huffcutt, 1997). Because subordinates are often the direct recipients of managerial actions and have the opportunity to witness first-hand the behaviors of managers on a day-to-day basis, subordinates can provide a unique perspective on how well the manager actually performs (Mount, 1984; Tsui & Ohlott, 1988). Thus, for this study I collected ratings of managerial performance from the managers' subordinates.

The resolution of how to rate manager performance was somewhat more problematic. Some studies conducted in organizational settings utilize the performance appraisal used by the organization as a measure of managerial performance (e.g., Oh & Berry, 2009). Other researchers create or modify measures specifically for their study (Walker, Smither, & Waldman, 2008). Thus, oftentimes, performance is measured within the context of the study, which has resulted in a lack of generally accepted, more global measures of managerial performance.

Nevertheless, a measure was needed, so I considered three criteria for choosing a measure that I believed important: (a) the measure must align with the task and contextual elements of managerial behaviors as outlined in the previous discussion of managerial performance, (b) the measure must have an acceptable level of reliability, and (c) given typical organizational constraints (i.e., time and money), the number of items must not be overly burdensome to the respondents.

Based on these criteria, I selected an eight-item measure that is more contextual in nature, and more reflective of behaviors observable by subordinates. This scale was composed by Mount (1984) based on items taken from the Management Position Description Questionnaire (MPDQ) by Tornow and Pinto (1976). The resulting eight items were those identified by three subject matter experts as most relevant to middle management positions, making this scale particularly relevant to this study. The full scale is included in *Appendix 2: Measures*, but a sample statement is, "Know-how – serving as a resource person on whom others can rely for technical advice." The statements were worded based on the responding referent group. Mount tested the measure in a single study with manager self-ratings, supervisors, and subordinates and found a scale reliability of .87.

For this study, subordinates were given the manager's name followed by the 8 statements of performance. Each item was rated on a 6-point Likert type scale (0=Not Sure/Does Not Apply; 1=Consistently performs way below expectations; 2=Consistently performs below expectations; 3=Consistently performs at expectations; 4=Consistently performs above expectations; 5=Consistently performs way above expectations). The full scale is included in *Appendix 1: Measures*. Coefficient alpha for this measure was .90 (M = 3.7; SD = .95).

Method of Analysis

The multi-level nature of this study lends itself to analysis using random coefficient modeling, i.e., hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002). Hierarchical linear models are the appropriate statistical mechanism for investigating and drawing conclusions about data that cross between levels of analysis (Hofmann, Griffin, & Gavin, 2000), such as is the case in this study. Hierarchical linear models also avoid the need for aggregation at any level.

Hierarchical linear models do present a statistical challenge in that it is difficult to estimate the required sample size needed to achieve adequate power (Scherbaum & Ferreter, 2009). Kreft (1996) determined that relatively large sample sizes were needed in multi-level studies, and in a simulation study, Basiri (1988) suggested that in order to detect cross-level interactions and maintain a power of .90 one would need 30 groups (Level 2) and 30 individuals (Level 1) in each group. In practice, however, achieving sample sizes of this magnitude are generally unrealistic. In organizational research, 50 or more groups seems to be a frequently occurring number for the level 2 variable (Maas & Hox, 2005). Further, Maas and Hox (2005) found in a simulation study that regression coefficients and variance components are estimated without bias, and standard errors for the regression coefficients are accurate, across a number of simulated conditions (the number of groups ranged from 30-100, and group sizes ranged from 5 to 50). In general, increasing the sample size at the Level 2 variable (i.e., the managers in this study) does more to influence power than significant increases in Level 1 variables (i.e., the subordinates in this study; Hofmann, 1997). Thus, a review of the literature on hierarchical linear models suggests that a minimum of 50 managers (Level 2) and 5 subordinates per manager (for a total $N = 250$) was needed to achieve satisfactory results. Given the realities of collecting field

data, I adopted a target of 75 managers and 3-5 subordinates per manager, resulting in an $N =$ 300-400 to provide the sample size necessary to achieve adequate power, reliability, and satisfactory statistical results. As outlined previously in the discussion of the sample, I obtained 70 complete sets (96% of which consisted of two or more subordinate responses) resulting in an $N = 370$ (manager and subordinate responses).

To test my hypotheses, I analyzed an intercepts-as-outcome model using HLM 7 for Windows (Raudenbush, Bryk, & Congdon, 2011). Managerial performance was entered as the level-1 outcome variable and CMP, CSE, PsyCap, and Managerial Skills were entered as level-2 variables. I also created interaction terms for CMPxCSE, CMPxPsyCap, and CMPxManagerial Skills by grand-mean centering each independent variable before calculating the interactions terms. The independent and interaction terms were then utilized for hypothesis testing.

CHAPTER 4: RESULTS

Table 2 (see below) shows the means, standard deviations, and intercorrelations among the study variables at each level. As can be seen in Table 2, the bivariate correlation coefficients between Complexity of Mental Processing (CMP), Core self-evaluations (CSE), Psychological Capital (PsyCap), and Managerial Skills are statistically significant, but the actual correlation coefficients are low to moderate. Significant correlation coefficients among the independent variables are often assumed to suggest the possibility of multicollinearity, however according to Kline (2005, p. 56) multicollinearity is not an issue unless the coefficients exceed 0.85. Additionally, a calculation of the coefficient of determination (r^2) indicated very little shared variance between the statistically significant variables, suggesting that these variables are capturing primarily information about unique constructs. Core self-evaluations and Psychological Capital share more variance than the other correlated variables, ($r^2 = .36$), but previous research suggests that the construct of Psychological Capital is distinct from Core self-

Table 2: *Means, Standard Deviations, and Intercorrelations among study variables*

Variable	M	SD	1	2	3	4	5
Level 1							
1.Subordinate Ratings of Manager Performance	3.7	0.95	*(.90)*				
Level 2							
2. Complexity of Mental Processing	5.91	3.2		*(.82)[a]*			
3. Core self-evaluations	4.66	0.54		.28*	*(.74)[a]*		
4. Psychological Capital	4.93	0.47		.37**	.60**	*(.88)[a]*	
5. Managerial Skills	4.89	0.7		.27*	0.1	0.18	*(.93)[a]*

Note. Level 1 n = 300; Level 2 n = 70. Cronbach's Alphas are on the diagonal.

[a] Cronbach Alpha's represent pre-aggregation reliabilities.

* $p < .05$. ** $p < .01$

evaluations (Luthans et al., 2007), so this was deemed sufficient to proceed with the analysis.

Before running the HLM model, it is important to determine the amount of variance in the outcome variable due to the level-2 variable(s) (Davison, Kwak, Seo, & Choi, 2002). This is accomplished by initiating an analysis of the null model (entering the outcome variable into a model by itself). The total amount of variance accounted for by level-2 variables can be determined by dividing the intercept variance component by the sum of the intercept variance component and the level-1 variance component. The resulting coefficient is called the intraclass correlation coefficient (ICC) and indicates the total amount of variance accounted for by the level-2 variable(s). In this case, ICC = .21 indicating that 21% of subordinate ratings of managerial performance are due to supervisor differences. While there is no definitive guide as to how much variance is "enough" to proceed with the analysis, 21.19% seemed sufficient to warrant investigation of the effects of the level-2 variables on the outcome. This conclusion was further supported by the statistical significance of the intercept variance component ($p < .001$).

Hypothesis Testing

Table 3 (see below) presents the results of the hypotheses tests. I tested my hypotheses by entering the dependent variable (subordinate ratings of managerial performance) as the outcome variable at level-1. All level-2 variables were grand-mean centered as recommended by Hofmann and Gavin (1998) with the exception of the interaction terms which were inserted without centering because they had been grand-mean centered prior to inserting them into the model.

Hypothesis 1 stated that CMP would be positively correlated with performance. To test this hypothesis, CMP was entered into the model at level-2 by itself with managerial

performance as the outcome variable. CMP was not a significant predictor of managerial performance, thus Hypothesis 1 was not supported.

Hypothesis 2 stated that CSE would moderate the correlation between CMP → Managerial performance such that managers lower in CSE would have lower performance ratings. To test this hypothesis, CMP, CSE, and the CMP x CSE interaction variable were entered into the model at level-2. CMP was not a significant predictor of performance, but CSE was ($p < .05$). However, the interaction effect was non-significant, and thus Hypothesis 2 was not supported.

Hypothesis 3 stated that PsyCap would moderate the correlation between CMP → Managerial performance such that managers higher in PsyCap would have higher performance ratings. To test this hypothesis, CMP, PsyCap, and the CMPxPsyCap interaction variable were entered into the model at level-2. CMP and PsyCap were not significant predictors of performance, nor was the interaction effect, and thus Hypothesis 3 was not supported.

Hypothesis 4 stated that Managerial Skills would moderate the correlation between CMP → Managerial performance such that managers higher in Managerial Skills would have higher performance ratings. To test this hypothesis, CMP, Managerial Skills, and the CMPxManagerial Skills interaction variable were entered into the model at level-2. CMP and Managerial Skills were not significant predictors of performance, nor was the interaction effect, and thus Hypothesis 4 was not supported.

In sum, none of the hypothesized relationships were supported, and only one main effect (CSE → Managerial performance) was statistically significant. In the remainder of this manuscript I will explore a number of limitations that may have influenced the outcomes of this study, and suggest future research that might address these limitations.

Table 3: *Hierarchical Linear Modeling Estimates Predicting Managerial Performance*

Predictors	Estimate	SE
Hypothesis 1		
Constant	3.61**	0.07
Complexity of Mental Processing (CMP)	0.01	0.02
Hypothesis 2		
Constant	3.61**	0.07
Complexity of Mental Processing (CMP)	-0.01	0.02
Core self-evaluations (CSE)	0.41*	0.13
CMP x CSE	-0.01	0.03
Hypothesis 3		
Constant	3.60**	0.08
Complexity of Mental Processing (CMP)	0.00	0.02
Psychologial Capital (PsyCap)	0.17	0.19
CMP x PsyCap	0.02	0.03
Hypothesis 4		
Constant	3.63**	0.08
Complexity of Mental Processing (CMP)	0.01	0.02
Managerial Skills (ManSkills)	0.11	0.12
CMP x ManSkills	-0.02	0.04

Note. SE = Standard Error.

* *p* < .05, **p < .001.
n = 300 (Level 1 Outcome); *n* = 70 (Level 2 Predictors)

CHAPTER 5: DISCUSSION

My study was built upon a theoretical framework proposed by Jaques and Cason (1994) that suggests that a manager's applied work capability (i.e., their ability to perform work tasks) is a function of a manager's level of complexity of mental processing (CMP, a measure of one's ability to deal with complexity), the extent to which they are interested and/or committed to managerial work, and the extent to which a person possesses managerial skills. In addition, they propose that a manager's work capability will be negatively influenced by negative personality characteristics (i.e., low self-esteem or high neuroticism). I extrapolated from this theoretical framework a model of managerial performance, in which a manager's complexity of mental processing would predict managerial performance and this relationship would be moderated by the manager's personality, their motivation to be a manager, and their level of managerial skill. Previous empirical research supported the logic of this model, so it is important to consider why more empirical support for the hypotheses was not found.

Possible Limitations to Finding Significant Results

One possible reason for the lack of support of the hypotheses could be an inadequate theoretical foundation. My hypothesized model relies on a framework utilized by Jaques and Cason as a part of a broader, more comprehensive and complex theory titled Stratified Systems Theory. While less well known, a significant amount of support has been found for this theory, and a number of its tenets, in previous research (Jacobs & Jaques, 1987; Jaques, 1986; Jaques & Stamp, 1990; Rowbottom & Billis, 1977; Stamp, 1981), including the framework utilized as a

reference for the hypothesized model. In addition, the amount of empirical evidence accumulated to date (previously reviewed in this manuscript) regarding each of the independent variables utilized in the model and their relationship with performance outcomes would suggest that the model was theoretically sound. Thus, I feel it is unlikely that weak theoretical underpinnings of the model were the cause of insignificant results.

A second possible reason for insignificant findings may be the nature of, and the relationship between, the variables. In all multivariate studies, it is assumed that the independent variables are normally distributed. An examination of the Q-Q plots, and the skewness and kurtosis statistics, of the independent and dependent variables used in this study suggested that the assumption of normality was met for all of the variables. Additionally, as previously noted, bivariate correlations among all of the independent variables were statistically significant, but actual correlation coefficients were low to moderate. Thus, the actual nature of the variables is unlikely to be a cause of insignificant results.

A third possible reason for the lack of support could be common method and rater bias. Common rater bias was curtailed to some degree by collecting the independent variables from the manager and the manager's boss, and collecting the dependent variable from the manager's subordinates. Collecting study variables in this method distribute the chance for rater bias across multiple parties and reduce it at any one respondent group, thus common rater bias should be minimized. The data was, however, self-report data collected using a single survey for each respondent group and is thus subject to common method bias. I felt, however, that common method bias was unavoidable due to the study variables being self-report constructs that could not be adequately assessed by any other source. Given the voluntary nature and anonymity of study participants, I see no reason to believe that respondents were untruthful or biased in their

responses, and as such feel that common method bias is not unduly influential (Conway & Lance, 2010).

A fourth limitation of the study that may have caused insignificant findings is related to the sample size. As discussed previously, predicting the size of the sample needed to achieve adequate power in multi-level studies is difficult (Scherbaum & Ferreter, 2009). It is possible that the sample size obtained for this study is inadequate to achieve sufficient power to arrive at accurate findings. Based on previous evidence presented, however, a sample of 50 level-2 cases and 5 level-1 matching cases (for a total N = 300) should yield a sample size resulting in adequate power. The sample obtained in this study contained 70 level-2 cases and 300 level-1 cases (total N = 370), exceeding the standards set by previous research. Thus, I feel that sample size was not a significant issue.

A fifth limitation that may have had an impact on the results was the position level of the managers in the sample. The target sample was middle managers (defined as managers reporting to a higher level manager and with other managers as subordinates), but obtaining sufficient numbers of middle managers proved to be a significant challenge. As a result, an insufficient quantity of true middle managers may have obfuscated the results. To assess the possibility of this limitation, two revised models were constructed and tested. In the first revised model, assistant supervisors and their corresponding performance ratings were removed from the sample. These were removed because they are a true first-line manager with no managerial subordinates. This reduced the total sample size to n(managers) = 65 and n(subordinates) = 280 (N = 345). Each of the four hypotheses was tested using managerial performance as the dependent variable and the results were identical. Only the main effect of CSE was a statistically significant predictor of managerial performance.

In the second revised model, supervisors and assistant supervisors were removed from the sample with their corresponding performance ratings. This reduced the total sample size to n(managers) = 36 and n(subordinates) = 147 (N = 183). Each of the four hypotheses was tested using managerial performance as the dependent variable and the results were again identical to the models with all managers included and the model that excluded assistant supervisors. Only the main effect of CSE was a statistically significant predictor of managerial performance. In this second model, however, results should be taken with caution as the sample size drops below the minimally accepted standards for HLM models. Nonetheless, based on the results of these additional tests, it seems unlikely that position level had a significant impact on the findings.

Having investigated some of the more common causes of insignificant results, and having determined that these limitations were unlikely to have influenced the findings, I am left to consider two other more probable influences on the outcomes. The first of these influences is the way in which the outcome variable was measured. As noted previously, managerial performance is difficult to rate and measures of managerial performance are inconsistent across studies. In this study, managerial performance was rated by subordinates on a variety of statements about their manager including, "Serves as a resource that others can rely on for technical advice," "Processes paper work quickly, accurately, and with close attention to details," and "Conducts performance appraisals regularly with each employee." (the full scale is in *Appendix 1: Measures*). In retrospect, a managerial performance measure of this nature may not have adequately tapped the complexity of managerial work, particularly the decision-making functions that are truly the complex functions of managers. Instead, it may have tapped impressions of managerial performance on routine behaviors that would be expected of most managers, regardless of a manager's level of complexity of mental processing. As a result,

establishing a relationship between one's complexity of mental processing and routine behaviors may have been unrealistic.

The second of these influences is related to the environment in which the sample was found. In short, the complexity of the jobs represented in this sample may not have been complex enough for complexity of mental processing to really matter. With the exception of the most senior positions (Directors and Asst. Directors), many of the managers who responded in this sample might not engage in complex decision-making on a regular basis. In fact, many of the decisions that ordinarily may be complex might often be made through a prescribed process, such as purchasing decisions or hiring new employees. In these cases, managers simply follow a process rather than engage in complex decision-making. The result is that many of the issues that might normally require more complexity of mental processing are routinized to the point that CMP is not engaged and/or required, and thus, CMP would likely fail to be a predictor of managerial performance. In essence, as an organization becomes more formalized (prescribed processes and procedures), a need for complexity of mental processing is reduced, and it is just this sort of organization in which the sample was taken.

In sum, a number of limitations may have contributed to the results found in this study. It is probable, however, that the measure of managerial performance (it's failure to capture the true complex nature of managerial performance) and the environment in which the sample resides (lack of a need to make regular complex decisions) are the most likely causes of the weak findings of this study.

Future Research

The results of this study, while disappointing, have introduced the possibility of additional avenues of research. A primary avenue for future research would directly address the

issue of managerial performance. Extensive review of the literature revealed that no consistent

measure of managerial performance exists, and specifically no measure exists that taps the

complexity of managerial work, evidenced most likely in their decision-making processes.

Tapping the complex abilities of managers may be better accomplished by utilizing scenarios

developed with subject matter experts that address complex managerial situations and the

decisions that must be made in the managerial process. Developing a measure of this nature

would be useful to both academics and practitioners in assessing managerial capability in

managerial research.

In addition to the measure of performance utilized, it will be important for future research

to consider the structure and environment of the organization in which data may be collected. It

is possible that more complex decision-making will be more evident in organic organizational

structures that are less formalized. Traditional mechanistic structures that are highly formalized

may have in place processes that negate the need for complex decision-making on the part of

managers, and thus may not be optimal organizations in which to study the effects of CMP on

managerial performance.

A second opportunity for possible future research involves predictors of managerial

performance based on who is rating that manager's performance. Traditional performance

management systems usually acquire ratings from immediate supervisors as the raters of a

managers' performance, but today multi-rater feedback systems are seen as viable alternatives

(Facteau & Craig, 2001). One of the reasons to adopt multi-rater feedback is to capture different

perspectives of managerial performance. It would be interesting to explore which predictors may

influence the different raters in their ratings of a manager's performance. Preliminary analysis of

secondary data acquired during the collection of data for this study suggests that the predictors of

managerial performance differ between a manager's boss and a manager's subordinates. In the case of the manager's boss, the managerial skill level of the manager, as rated by the manager's boss, seemed to be an important predictor of the performance rating. On the other hand, a manager's core self-evaluations seemed to be more predictive of performance ratings by subordinates. This would seem to suggest that when a manager's superior rates the manager's performance, the manager's skills are of primary concern, but the ratings by subordinates are reflective of the personality of the manager. This could have significant implications for multi-rater feedback systems, as well as manager selection. A more detailed review of the literature in this area, along with a more robust sample of data, would be needed to explore this avenue of future research.

A third avenue of possible future research may be in the measurement of complexity of mental processing. For this study, I used the Raven's APM, a widely accepted and validated measure of general mental ability that taps fluid intelligence (Bors & Stokes, 1998; Carpenter et al., 1990), which is synonymous with complexity of mental processing. It is said by some to be an excellent measure of fluid intelligence (Day et al., 2001), but it is very arduous to administer. Because of it's proprietary nature, it must be administered with a paper-and-pencil measure using expensive test booklets and answer sheets, or through a proprietary website at considerable cost. This is both expensive and impractical for furthering future managerial research. Recent calls, however, have been issued to reestablish a research agenda on intelligence in the workplace (Scherbaum, Goldstein, Yusko, Ryan, & Hanges, 2012). Future work to develop a reliable but simple test for complexity of mental processing may find widespread support among practitioners and academics alike.

Conclusions

In this study it was hypothesized that a manager's complexity of mental processing would be directly related to their performance, and that personality, their level of motivation to be a manager, and the level of managerial skills they possess would moderate that relationship. This study did not produce sufficient results to confirm these hypotheses. Several limitations of the study and probable reasons for the lack of empirical support were presented, with the most likely culprits being the use of a measure of managerial performance that was somewhat broad in nature and failed to capture the level of complexity sought after for this study as well as the work environment from which the sample was obtained. Future research studies were proposed that might correct this deficiency as well as promote additional managerial research.

REFERENCES

Abraham, S. E., Karns, L. A., Shaw, K., & Mena, M. A. (2001). Managerial competencies and the managerial performance appraisal process. *Journal of Management Development*, *20*(10), 842-852. Retrieved from Google Scholar.

Ackerman, P. L., & Heggestad, E. D. (1997). Intelligence, personality, and interests: Evidence for overlapping traits. *Psychological Bulletin*, *121*(2), 219-245. Retrieved from Google Scholar.

Adams, V. H., Snyder, C. R., Rand, K. L., King, E. A., Sigmon, D. R., & Pulvers, K. M. (2002). Hope in the workplace. In R. Giacolone & C. Jurkiewicz (Eds.), *Handbook of workplace spirituality and organizational performance* (pp. 367-377). New York: ME Sharpe Inc. Retrieved from Google Scholar.

Andersen, J. A. (2006). Leadership, personality and effectiveness. *Journal of Socio-Economics*, *35*(6), 1078-1091. Retrieved from Google Scholar.

Arthur, W., & Day, D. V. (1994). Development of a short form for the raven advanced progressive matrices test. *Educational and Psychological Measurement*, *54*(2), 394-403. Retrieved from Google Scholar.

Avey, J. B., Luthans, F., Smith, R. M., & Palmer, N. F. (2010). Impact of positive psychological capital on employee well-being over time. *Journal of Occupational Health Psychology*, *15*(1), 17-28. doi:10.1037/a0016998

Bass, B. M., & Stogdill, R. M. (1990). Chapter 20: The work of leaders and managers. In *Bass &*
stogdill's handbook of leadership: Theory, research, and managerial applications (pp.
383-414). London: Collier Macmillan. Retrieved from Auburn University.

Bassiri, D. (1988). Large and small sample properties of maximum likelihood estimates for the
hierarchical linear model. *Unpublished Doctoral Dissertation, Department of*
Counseling, Educational Psychology, and Special Education, Michigan State University.
Retrieved from Google Scholar.

Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Volts, K. D. (2003). Does high self-esteem
cause better performance, interpersonal success, happiness, or healthier lifestyles?
Psychological Science in the Public Interest, *4*(1), 1-44.

*B*ono, J. E., & Judge, T. A. (2003). Core self-evaluations: A review of the trait and its role in job
satisfaction and job performance. *European Journal of Personality*, *17*, S5-S18.
doi:10.1002/per.481

Borman, W. C., & Brush, D. H. (1993). More progress toward a taxonomy of managerial
performance requirements. *Human Performance*, *6*(1), 1-21. Retrieved from Google
Scholar.

Bors, D. A., & Stokes, T. L. (1998). Raven's advanced progressive matrices: Norms for first-year
university students and the development of a short form. *Educational and Psychological*
Measurement, *58*(3), 382-394. Retrieved from Google Scholar.

Boyatzis, R. E. (1982). *The competent manager: A model for effective performance* (pp. xiv,
308). New York: Wiley. Retrieved from Auburn University.

Campbell, J. J., Dunnette, M. D., Lawler, E. E., & Weick, K. E. (1970). Managerial behavior,
performance, and effectiveness. In McGraw-Hill. Retrieved from Google Scholar.

Campbell, J. P. (1970). Chapter 5 defining and measuring managerial effectiveness. In

    Managerial behavior, performance, and effectiveness (pp. xiv, 546). New York:

    McGraw-Hill. Retrieved from Auburn University.

Carpenter, P. A., Just, M. A., & Shell, P. (1990). What one intelligence test measures: A

    theoretical account of the processing in the raven progressive matrices test. *Psychological*

    Review, *97*(3), 404-431. Retrieved from Google Scholar.

Carroll, J. B. (1993). *Human cognitive abilities* (illustrated ed., p. 819). Cambridge ;: Cambridge

    University Press. Retrieved from Google Books.

Carroll, S. J., & Gillen, D. J. (1987). Are the classical management functions useful in describing

    managerial work? *Academy of Management Review*, *12*(1), 38-51. Retrieved from

    Google Scholar.

Cattell, R. B. (1941). Some theoretical issues in adult intelligence testing. *Psychological Bulletin*,

    38, 592-602. Retrieved from Google Scholar.

Chemers, M. M. (2002). Leadership effectiveness: An integrative review. In M. A. Hogg & R. S.

    Tindale (Eds.), *Blackwell handbook of social psychology: Group processes* (pp. 376-

    399). Oxford, UK: Blackwell Publishers Ltd. doi:10.1002/9780470998458.ch16

Conway, J. M., & Huffcutt, A. I. (1997). Psychometric properties of multisource performance

    ratings: A meta-analysis of subordinate, supervisor, peer, and self-ratings. *Human*

    Performance, *10*(4), 331-360. Retrieved from Google Scholar.

Conway, J. M., & Lance, C. E. (2010). What reviewers should expect from authors regarding

    common method bias in organizational research. *Journal of Business and Psychology*, *25*,

    325-334. doi:10.1007/s10869-010-9181-6

Curtis, D. B., Winsor, J. L., & Stephens, R. D. (1989). National preferences in business and

communication education. *Communication Education*, *38*(1), 6-14. Retrieved from

Google Scholar.

Davison, M. L., Kwak, N., Seo, Y. S., & Choi, J. (2002). Using hierarchical linear models to

examine moderator effects: Person-by-organization interactions. *Organizational*

Research Methods, *5*(3), 231-254. doi:10.1177/1094428102005003003

Day, E. A., Arthur Jr, W., & Gettman, D. (2001). Knowledge structures and the acquisition of a

complex skill. *Journal of Applied Psychology*, *86*(5), 1022-1033. doi:10.1037//0021-

9010.86.5.1022

Denison, D. R., Hooijberg, R., & Quinn, R. E. (1995). Paradox and performance: Toward a

theory of behavioral complexity in managerial leadership. *Organization Science*, *6*(5),

524-540. Retrieved from Google Scholar.

Derue, D. S., Nahrgang, J. D., Wellman, N., & Humphrey, S. E. (2011). Trait and behavioral

theories of leadership: An integration and meta-analytic test of their relative validity.

Personnel Psychology, *64*(1), 7-52.

Dierdorff, E. C., Rubin, R. S., & Morgeson, F. P. (2009). The milieu of managerial work: An

integrative framework linking work context to role requirements. *The Journal of Applied*

Psychology, *94*(4), 972-988. doi:10.1037/a0015456

Dormann, C., Fay, D., Zapf, D., & Frese, M. (2006). A state-trait analysis of job satisfaction: On

the effect of core self-evaluations. *Applied Psychology*, *55*(1), 27-51. Retrieved from

Google Scholar.

Drucker, P. F. (1967). *The effective executive* (pp. viii, 178). New York,: Harper & Row.

Retrieved from Auburn University.

Dudley, N. M., Orvis, K. A., Lebiecki, J. E., & Cortina, J. M. (2006). A meta-analytic investigation of conscientiousness in the prediction of job performance: Examining the intercorrelations and the incremental validity of narrow traits. *Journal of Applied Psychology*, *91*(1), 40-57.

Erez, A., & Judge, T. A. (2001). Relationship of core self-evaluations to goal setting, motivation, and performance. *Journal of Applied Psychology*, *86*(6), 1270-1279. doi:10.1037//0021-9010.86.6.1270

Facteau, J. D., & Craig, S. B. (2001). Are performance appraisal ratings from different rating sources comparable? *Journal of Applied Psychology*, *86*(2), 215-227. Retrieved from Google Scholar.

Fayol, H. (1949). *General and industrial management* (revised ed., p. 112). London, UK: Sir Isaac Pitman and Sons LTD. Retrieved from Google Books.

Fraser, C., & Zarkada-Fraser, A. (2003). Investigating the effectiveness of managers through an analysis of stakeholder perceptions. *The Journal of Management Development*, *22*(9), 762-783. Retrieved from Google Scholar.

Fulmer, I. S., Gerhant, B., & Scott, K. S. (2003). Are the 100 best better? An empirical investigation of the relationship between being a "great place to work" and firm performance. *Personnel Psychology*, *56*(4), 965-993. Retrieved from EBSCO Host.

Furnham, A. (2008). 6. Cognitive ability at work. In *Personality and intelligence at work: Exploring and explaining individual differences at work* (pp. 180-209). Psychology Press. Retrieved from Google Scholar.

Georgiou, I. (2006). Managerial effectiveness from a system theoretical point of view. *Systemic Practice and Action Research*, *19*(5), 441-459. Retrieved from Google Scholar.

Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, *17*(2), 183-211. Retrieved from EBSCO Host.

Goldstein, H. W., Zedeck, S., & Goldstein, I. L. (2002). G: Is this your final answer? *Human Performance*, *15*(1-2), 123-142. Retrieved from Google Scholar.

Gottfredson, L. S. (2002). Where and why g matters: Not a mystery. *Human Performance*, *15*(1-2), 25-46. Retrieved from Google Scholar.

Hansen, G. S., & Wernerfelt, B. (1989). Determinants of firm performance: The relative importance of economic and organizational factors. *Strategic Management Journal*, *10*(5), 399-411. Retrieved from Google Scholar.

Hardt, P. (1997). Eight success factors for first-line leaders in high involvement organizations and how to develop them. *Performance Improvement*, *36*(4), 36-39. Retrieved from Google Scholar.

Harris, K. J., Harvey, P., & Kacmar, K. M. (2009). Do social stressors impact everyone equally? An examination of the moderating impact of core self-evaluations. *Journal of Business and Psychology*, *24*(2), 153-164. doi:10.1007/s10869-009-9096-2

Heidemeier, H., & Moser, K. (2009). Self--other agreement in job performance ratings: A meta-analytic test of a process model. *Journal of Applied Psychology*, *94*(2), 353-370. Retrieved from Google Scholar.

Hemphill, J. K. (1959). Job descriptions for executives. *Harvard Business Review 37*(5), 55-67. Retrieved from Google Scholar.

Hofmann, D. A. (1997). An overview of the logic and rationale of hierarchical linear models. *Journal of Management*, *23*(6), 723-744. Retrieved from Google Scholar.

Hofmann, D. A., & Gavin, M. B. (1998). Centering decisions in hierarchical linear models: Implications for research in organizations. *Journal of Management*, *24*(5), 623-641. Retrieved from Google Scholar.

Hofmann, D. A., Griffin, M. A., & Gavin, M. B. (2000). The application of hierarchical linear modeling to organizational research. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations* (pp. 467-511). San Francisco, CA: Jossey-Bass Publishers. Retrieved from Google Scholar.

Hogan, J., & Holland, B. (2003). Using theory to evaluate personality and job-performance relations: A socioanalytic perspective. *The Journal of Applied Psychology*, *88*(1), 100-112. doi:10.1037/0021-9010.88.1.100

Hogan, R., Curphy, G. J., & Hogan, J. (1994). What we know about leadership: Effectiveness and personality. Retrieved from EBSCO Host.

House, R. J., & Aditya, R. N. (1997). The social scientific study of leadership: Quo vadis? *Journal of Management*, *23*(3), 409-473. Retrieved from Google Scholar.

Hubbard, M., McCloy, R., Campbell, J., Nottingham, J., Lewis, P., Rivkin, D., & Levine, J. (2000). Revision of O* NET data collection instruments. Raleigh, NC: National O* NET Consortium, Employment Security Commission. Retrieved March. Retrieved from Google Scholar.

Hunter, J. E. (1983). A causal analysis of cognitive ability, job knowledge, job performance, and supervisor ratings. In F. Landy, S. Zedeck, & J. Cleveland (Eds.), *Performance measurement and theory* (pp. 257-266). Erlbaum Hillsdale, NJ. Retrieved from Google Scholar.

Hunter, J. E., & Hunter, R. F. (1984). Validity and utility of alternative predictors of job

 performance. *Psychological Bulletin*, *96*(1), 72-98. Retrieved from Google Scholar.

Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance: The five revisited.

 Journal of Applied Psychology, *85*(6), 869-879.

Jacobs, T. O., & Jaques, E. (1987). Leadership in complex systems. In J. Zeidner (Ed.), *Human*

 productivity enhancement: Organizations, personnel and decision making (Vol. 2, p.

 495). Praeger. Retrieved from Google Books.

Jaques, E. (1986). The development of intellectual capability: A discussion of stratified systems

 theory. *The Journal of Applied Behavioral Science*, *22*(4), 361-383. Retrieved from

 Google Scholar.

Jaques, E., & Cason, K. (1994). *Human capability: A study of individual potential and its*

 application (pp. viii-165). Cason Hall & Co Publishers. Retrieved from Google Scholar.

Jaques, E., & Stamp, G. (1990). Development of stratified systems theory for possible

 implementation in the US army. United States Army Research Institute for the

 Behavioral and Social Sciences. Retrieved from Google Scholar.

Johnson, R. E., Rosen, C. C., & Levy, P. E. (2008). Getting to the core of core self-evaluation: A

 review and recommendations. *Journal of Organizational Behavior*, *29*(3), 391-413.

De Jong, J. A., Leenders, F. J., & Thijssen, J. G. L. (1999). HRD tasks of first-level managers.

 Journal of Workplace Learning, *11*(5), 176-183. Retrieved from Google Scholar.

Judge, T. A. (2009). Core self-evaluations and work success. *Current Directions in*

 Psychological Science, *18*(1), 58-62. Retrieved from Google Scholar.

Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits-self-esteem,

 generalized self-efficacy, locus of control, and emotional stability-with job satisfaction

and job performance: A meta-analysis. *Journal of Applied Psychology*, *86*(1), 80-92. doi:10.1037//0021-9010.86.1.80

Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2003). The core self-evaluations scale: Development of a measure. *Personnel Psychology*, *56*(2), 303-331. doi:10.1111/j.1744-6570.2003.tb00152.x

Judge, T. A., Locke, E. A., & Durham, C. C. (1997). The dispositional causes of job satisfaction: A core-evaluations approach. *Research in Organizational Behavior*, *19*, 151-188. Retrieved from Google Scholar.

Judge, T. A., Van Vianen, A. E. M., & De Pater, I. E. (2004). Emotional stability, core self-evaluations, and job outcomes: A review of the evidence and an agenda for future research. *Human Performance*, *17*(3), 325-346. Retrieved from Google Scholar.

Kacmar, K. M., Collins, B. J., Harris, K. J., & Judge, T. A. (2009). Core self-evaluations and job performance: The role of the perceived work environment. *The Journal of Applied Psychology*, *94*(6), 1572-80. doi:10.1037/a0017498

Katz, R. L. (1974). Skills of an effective administrator. *Harvard Business Review*, *52*(5), 90-102. Retrieved from Google Scholar.

Katzenbach, J. R. (1997). *Real change leaders : How you can create growth and high performance at your company* (pp. 357). London: Nicholas Brealey. Retrieved from Google Books.

King, A. W., Fowler, S. W., & Zeithaml, C. P. (2001). Managing organizational competencies for competitive advantage: The middle-management edge. *The Academy of Management Executive*, *15*(2), 95-106. Retrieved from Google Scholar.

Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New

    York, NY: The Guilford Press.

Kotter, J. P. (1982). What effective general managers really do. *Harvard Business Review*, *60*(6),

    156-167. Retrieved from Google Scholar.

Kotter, J. P. (1990). *A force for change: How leadership differs from management* (pp. xi, 180).

    London: Collier Macmillan. Retrieved from Auburn University.

Kotter, J. P. (1999). *John P. Kotter on what leaders really do* (p. 184). Boston: Harvard Business

    School Press. Retrieved from Auburn University.

Kreft, I. G. G. (1996). Are multilevel techniques necessary? An overview, including simulation

    studies. *Unpublished Manuscript, California State University, Los Angeles.* Retrieved

    from Google Scholar.

Law, K. S., Wong, C. S., & Mobley, W. H. (1998). Toward a taxonomy of multidimensional

    constructs. *Academy of Management Review*, 741-755. Retrieved from Google Scholar.

Levenson, A. R., Van der Stede, W. A., & Cohen, S. G. (2006). Measuring the relationship

    between managerial competencies and performance. *Journal of Management*, *32*(3), 360-

    380. Retrieved from Google Scholar.

Longenecker, C. O., & Fink, L. S. (2001). Improving management performance in rapidly

    changing organizations. *Journal of Management Development*, *20*(1), 7-18. Retrieved

    from Google Scholar.

Luthans, F. (1988). Successful vs. Effective real managers. *The Academy of Management

    Executive (1987-1989)*, *2*(2), 127-132. Retrieved from Google Scholar.

Luthans, F., & Youssef, C. M. (2004). Human, social, and now positive psychological capital

    management. *Organizational Dynamics*, *33*(2), 143-160. Retrieved from Google Scholar.

Luthans, F., Avey, J. B., & Patera, J. L. (2008). Experimental analysis of a web-based training

    intervention to develop positive psychological capital. *The Academy of Management*

    Learning and Education ARCHIVE, *7*(2), 209-221. Retrieved from Google Scholar.

Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Positive psychological capital:

    Measurement and relationship with performance and satisfaction. *Personnel Psychology*,

    60, 541-572.

Luthans, F., Avolio, B. J., Walumbwa, F. O., & Li, W. (2005). The psychological capital of

    chinese workers: Exploring the relationship with performance. *Management and*

    Organization Review, *1*(2), 249-271. Retrieved from Google Scholar.

Luthans, F., Luthans, K. W., & Luthans, B. C. (2004). Positive psychological capital: Beyond

    human and social capital. *Business Horizons*, *47*(1), 45-50. Retrieved from Google

    Scholar.

Luthans, F., Rosenkrantz, S. A., & Hennessey, H. W. (1985). What do successful managers

    really do? An observation study of managerial activities. *The Journal of Applied*

    Behavioral Science, *21*(3), 255-270. doi:10.1177/002188638502100303

Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological capital : Developing the*

    human competitive edge (illustrated ed., p. 246). Oxford ; New York: Oxford University

    Press US. Retrieved from Google Books.

Maas, C. J. M., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling.

    Methodology: European Journal of Research Methods for the Behavioral and Social

    Sciences, *1*(3), 86-92. Retrieved from Google Scholar.

Mann, R. D. (1959). A review of the relationships between personality and performance in small

    groups. *Psychological Bulletin*, *56*(4), 241-270. Retrieved from Google Scholar.

McClelland, D. C. (1967). *The achieving society* (reissue, illustrated ed., p. 512). New York: Simon and Schuster. Retrieved from Google Books.

McClelland, D. C., & Burnham, D. H. (2003). Power is the great motivator. *Harvard Business Review*, *81*(1), 117-126.

McKay, P. F., Doverspike, D., Bowen-Hilton, D., & Martin, Q. D. (2002). Stereotype threat effects on the raven advanced progressive matrices scores of african americans. *Journal of Applied Social Psychology*, *32*(4), 767-787. doi:10.1111/j

Meyer, J. P., Becker, T. E., & Vandenberghe, C. (2004). Employee commitment and motivation: A conceptual analysis and integrative model. *Journal of Applied Psychology*, *89*(6), 991-1007. Retrieved from Google Scholar.

Mintzberg, H. (1973). *The nature of managerial work.* Harper & Row New York. Retrieved from Google Scholar.

Mintzberg, H. (1994). Rounding out the manager's job. *Sloan Management Review*, *36*(1), 11-26.

Morse, J. J., & Wagner, F. R. (1978). Measuring the process of managerial effectiveness. *Academy of Management Journal*, *21*(1), 23-35. Retrieved from Google Scholar.

Mount, M. K. (1984). Psychometric properties of subordinate ratings of managerial performance. *Personnel Psychology*, *37*(4), 687-702. Retrieved from Google Scholar.

Mount, M. K., Barrick, M. R., & Stewart, G. L. (1998). Five-factor model of personality and performance in jobs involving interpersonal interactions. *Human Performance*, *11*(2-3), 145-165. Retrieved from Google Scholar.

Mumford, M. D., Peterson, N. G., & Childs, R. A. (1999). Basic and cross-functional skills. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of*

O*NET (1 ed., pp. 49-69). American Psychological Association. Retrieved from Google
Scholar.

Mumford, T. V., Campion, M. A., & Morgeson, F. P. (2007). The leadership skills strataplex:
Leadership skill requirements across organizational levels. *The Leadership Quarterly*,
18(2), 154-166. Retrieved from Google Scholar.

Murphy, S. E. (1992). *The contribution of leadership experience and self-efficacy to group
performance under evaluation apprehension.* Thesis. Retrieved from Google Scholar.

Oh, I. S., & Berry, C. M. (2009). The five-factor model of personality and managerial
performance: Validity gains through the use of 360-degree performance ratings. *Journal
of Applied Psychology*, *94*(6), 1498-1513. Retrieved from Google Scholar.

Pavett, C. M., & Lau, A. W. (1983). Managerial work: The influence of hierarchical level and
functional specialty. *Academy of Management Journal*, 170-177. Retrieved from Google
Scholar.

Peterson, S. J., Luthans, F., Avolio, B. J., Walumbwa, F. O., & Zhang, Z. (2011). Psychological
capital and employee performance: A latent growth modeling approach. *Personnel
Psychology*, *64*(2), 427-450. Retrieved from Google Scholar.

Ployhart, R. E., Schneider, B., & Schmitt, N. (2006). 8 hiring procedures I: Cognitive ability and
certification exams. In *Staffing organizations : Contemporary practice and theory* (3,
illustrated ed., p. 661). Mahwah, N.J.: Lawrence Erlbaum Associates. Retrieved from
Google Books.

Pulakos, E. D., & O''Leary, R. S. (2011). Why is performance management broken? *Industrial
and Organizational Psychology*, *4*(2), 146-164. Retrieved from Google Scholar.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods.* Sage Publications. Retrieved from Google Scholar.

Raudenbush, S. W., Bryk, A. S., & Congdon, R. (2011). *HLM 7 for windows* [Computer Software]. Skokie, IL: Scientific Software International, Inc.

Raven, J. (2000). The raven's progressive matrices: Change and stability over culture and time. *Cognitive Psychology*, *41*(1), 1-48. Retrieved from Google Scholar.

Raven, J. C., Court, J. H., & Raven, J. E. (1978). *Manual for raven's progressive matrices and vocabulary scales* (revised ed., p. 15). London: H. K. Lewis. Retrieved from Google Books.

Reay, T., Golden-Biddle, K., & Germann, K. (2006). Legitimizing a new role: Small wins and microprocesses of change. *Academy of Management Journal*, *49*(5), 977-998. Retrieved from EBSCO Host.

Reddin, W. J. (1970). *Managerial effectiveness* (pp. xiv, 352). New York,: McGraw-Hill. Retrieved from Auburn University.

Ree, M. J., & Carretta, T. R. (2002). G2k. *Human Performance*, *15*(1-2), 3-24. Retrieved from Google Scholar.

Ren, C. R., & Guo, C. (2011). Middle managers' strategic role in the corporate entrepreneurial process: Attention-Based effects. *Journal of Management*, *37*(6), 1586-1610. doi:10.1177/0149206310397769

Robbins, S. P., & Coulter, M. K. (2008). *Management* (10, illustrated ed., p. 565). Upper Saddle River, N.J.: Pearson Prentice Hall. Retrieved from Google Books.

Rost, J. C. (1991). *Leadership for the twenty-first century.* New York: Praeger. Retrieved from WorldCat.

Rowbottom, R., & Billis, D. (1977). The stratification of work and organizational design. *Human Relations*, *30*(1), 53-76. doi:10.1177/001872677703000104

Rubin, R. S., & Dierdorff, E. C. (2011). On the road to abilene: Time to manage agreement about MBA curricular relevance. *Academy of Management Learning & Education*, *10*(1), 148-161.

Sadler--Smith, E., Hampson, Y., Chaston, I., & Badger, B. (2003). Managerial behavior, entrepreneurial style, and small firm performance. *Journal of Small Business Management*, *41*(1), 47-67. Retrieved from Google Scholar.

Sayles, L. R. (1979). *Leadership: What effective managers really do ... And how they do it* (pp. xvi, 251). New York: McGraw-Hill. Retrieved from Auburn University.

Scheier, M. F., Weintraub, J. K., & Carver, C. S. (1986). Coping with stress: Divergent strategies of optimists and pessimists. *Journal of Personality and Social Psychology*, *51*(6), 1257-1264. Retrieved from Google Scholar.

Scherbaum, C. A., & Ferreter, J. M. (2009). Estimating statistical power and required sample sizes for organizational research using multilevel modeling. *Organizational Research Methods*, *12*(2), 347-367. doi:10.1177/1094428107308906

Scherbaum, C. A., Goldstein, H. W., Yusko, K. P., Ryan, R., & Hanges, P. J. (2012). Intelligence 2.0: Reestablishing a research program on g in I--O psychology. *Industrial and Organizational Psychology*, *5*(2), 128-148. doi:1754-9426/12

Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical. *Psychological Bulletin*, *124*(2), 262-274. Retrieved from EBSCO Host.

Semadar, A., Robins, G., & Ferris, G. R. (2006). Comparing the validity of multiple social

      effectiveness constructs in the prediction of managerial job performance. *Journal of*

      Organizational Behavior, *27*(4), 443-461. Retrieved from Google Scholar.

Shipper, F., & Davy, J. (2002). A model and investigation of managerial skills, employees'

      attitudes, and managerial performance. *The Leadership Quarterly*, *13*(2), 95-120.

      Retrieved from Google Scholar.

Spearman, C. (1904). General intelligence," objectively determined and measured. *The American*

      Journal of Psychology, *15*(2), 201-292. Retrieved from Google Scholar.

Stahl, M. J. (1983). Achievement, power and managerial motivation: Selecting talent with the

      job choice exercise. *Personnel Psychology*, *36*(4), 775-789. doi:10.1111/j.1744-

      6570.1983.tb00512.x

Stajkovic, A. D. (2006). Development of a core confidence-higher order construct. *Journal of*

      Applied Psychology, *91*(6), 1208-1224. Retrieved from EBSCO Host.

Stamp, G. (1981). Levels and types of managerial capability. *Journal of Management Studies*,

      18(3), 277-298. Retrieved from Google Scholar.

Stogdill, R. M. (1948). Personal factors associated with leadership; a survey of the literature.

      Journal of Psychology: Interdisciplinary and Applied. Retrieved from Google Scholar.

Stumpp, T., Hulsheger, U. R., Muck, P. M., & Maier, G. W. (2009). Expanding the link between

      core self-evaluations and affective job attitudes. *European Journal of Work and*

      Organizational Psychology, *18*(2), 148-166. doi:10.1080/13594320802281110

Tenopyr, M. L. (2002). Theory versus reality: Evaluation of g in the workplace. *Human*

      Performance, *15*(1-2), 107-122. Retrieved from Google Scholar.

Tornow, W. W., & Pinto, P. R. (1976). The development of a managerial job taxonomy: A system for describing, classifying, and evaluating executive positions. *Journal of Applied Psychology*, *61*(4), 410-418. Retrieved from Google Scholar.

Tsui, A. S., & Ohlott, P. (1988). Multiple assessment of managerial effectiveness: Interrater agreement and consensus in effectiveness models. *Personnel Psychology*, *41*(4), 779-803. Retrieved from Google Scholar.

Van Velsor, E., & Leslie, J. B. (1995). Why executives derail: Perspectives across time and cultures. *The Academy of Management Executive (1993-2005)*, 62-72. Retrieved from Google Scholar.

Viswesvaran, C., & Ones, D. S. (2000). Perspectives on models of job performance. *International Journal of Selection and Assessment*, *8*(4), 216-226. Retrieved from Google Scholar.

Walker, A. G., Smither, J. W., & Waldman, D. A. (2008). A longitudinal examination of concomitant changes in team leadership and customer satisfaction. *Personnel Psychology*, *61*(3), 547-577. Retrieved from Google Scholar.

Walumbwa, F. O., Peterson, S. J., Avolio, B. J., & Hartnell, C. A. (2010). An investigation of the relationships among leader and follower psychological capital, service climate, and job performance. *Personnel Psychology*, *10*(4), 937-963.

Whetten, D. A., & Cameron, K. S. (2010). *Developing management skills* (8th ed., p. 744). Harlow: Pearson Education. Retrieved from Google Books.

Wilson, C. L., & Wilson, J. L. (1991). Teams and leaders: A manual for the clark wilson publishing company training and development programs. In *Clark wilson group, silver spring, MD*. Silverspring, MD: The Clark Wilson Group. Retrieved from Google Scholar.

Young, B. S., Arthur, W., & Finch, J. (2000). Predictors of managerial performance: More than

    cognitive ability. *Journal of Business and Psychology*, *15*(1), 53-72. Retrieved from

    Google Scholar.

Yukl, G. A. (1987). A new taxonomy for integrating diverse perspectives on managerial

    behavior. In *American psychological association meeting, new york.* Retrieved from

    Google Scholar.

Yukl, G. A. (2010). *Leadership in organizations, 7th edition* (pp. 1-628). Upper Saddle River,

    N.J. : Prentice Hall.

APPENDIX 1 - MEASURES

Complexity of Mental Processing

Measured using a short version of the Raven's APM, a measure of fluid intelligence based on a sequence of patterns compiled into a puzzle. The respondent is asked to pick from eight options the option that will best complete the puzzle. This test must be administered in person in a paper-and-pencil format. It must be purchased from Pearson Testing Services, and because of it's proprietary nature cannot be reproduced. However, a sample item from another source that is representative of the items on the Raven's APM is shown below (retrieved from http://www.iqtest.dk/main.swf on Nov. 17, 2011).
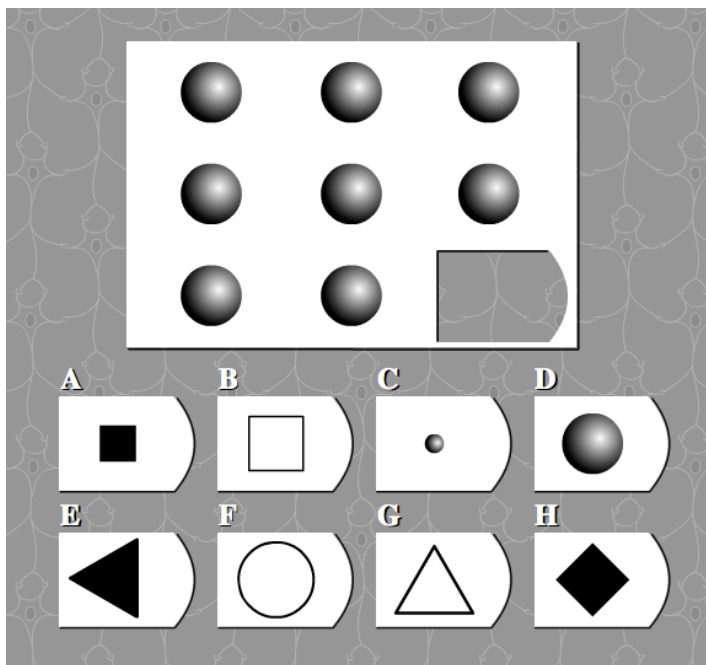
Psychological Capital

Psychological capital was measured using the 24-item Psychological Capital Questionnaire (PCQ-24; Luthans et al., 2007). The PCQ-24 consists of 24 items (6 each for self-efficacy, hope, optimism, and resiliency). Each item is rated on a 6-point Likert type scale (1=Strongly Disagree, 6=Strongly Agree).

Instructions: Below are statements that describe how you may think about yourself **right now**. Use the following scales to indicate your level of agreement or disagreement with each statement.

1   I feel confident analyzing a long-term problem to find a solution.
2   I feel confident in representing my work area in meetings with management.
3   I feel confident contributing to discussions about the company's strategy.
4   I feel confident helping to set targets/goals in my work area.
5   I feel confident contacting people outside the company (e.g., suppliers, customers) to discuss problems.
6   I feel confident presenting information to a group of colleagues.
7   If I should find myself in a jam at work, I could think of many ways to get out of it.
8   At the present time, I am energetically pursuing my work goals.
9   There are lots of ways around any problem.
10 Right now I see myself as being pretty successful at work.
11 I can think of many ways to reach my current work goals.
12 At this time, I am meeting the work goals that I have set for myself.
13 When I have a setback at work, I have trouble recovering from it and moving on. (R)
14 I usually manage difficulties one way or another at work.
15 I can be "on my own," so to speak, at work if I have to.
16 I usually take stressful things at work in stride.
17 I can get through difficult times at work because I've experienced difficulty before.
18 I feel I can handle many things at a time at this job.
19 When things are uncertain for me at work, I usually expect the best.
20 If something can go wrong for me work-wise, it will. (R)
21 I always look on the bright side of things regarding my job.
22 I'm optimistic about what will happen to me in the future as it pertains to work.
23 In this job, things never work out the way I want them to. (R)
24 I approach this job as if "every cloud has a silver lining."

(R) =Reversed scored

Core self-evaluations

Core self-evaluations was measured using the 12-item Core Self-evaluations Scale (CSES; Judge et al., 2003). Each item is rated on a 6-point Likert type scale (1=Strongly Disagree, 6=Strongly Agree).

Instructions: Below are several statements about you **in general** with which you may agree or disagree. Using the response scale to the right, indicate your agreement or disagreement for each statement.

1   I am confident I get the success I deserve in life.
2   Sometimes I feel depressed. (R)
3   When I try, I generally succeed.
4   Sometimes when I fail I feel worthless. (R)
5   I complete tasks successfyully.
6   Sometimes, I do not feel in control of my work. (R)
7   Overall, I am satisfied with myself.
8   I am filled with doubts about my competence. (R)
9   I determine what will happen in my life.
10   I do not feel in control of my success in my career. (R)
11   I am capable of coping with most of my problems.
12   There are times when things look pretty bleak and hopeless to me. (R)

(R) =Reversed scored

Managerial Skills

Managerial skills is measured using 20 items from the generalized work skills questionnaire provided by the U.S. Department of Labor for the Occupational Information Network (O*NET). Subordinates were given the statement, "My manager does very well at . . ." followed by the 20 statements reflecting the skills selected. Each item was rated on a 7-point Likert type scale (0=Not Sure/Does Not Apply; 1=Strongly Disagree; 2=Disagree; 3=Somewhat Disagree; 4=Somewhat Agree; 5=Agree; 6=Strongly Agree).

1.   Understanding written sentences and paragraphs in work-related documents
2.   Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
3.   Communicating effectively in writing as appropriate for the needs of the audience.
4.   Talking to others to convey information effectively.
5.   Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.
6.   Understanding the implications of new information for both current and future problem solving and decision-making.
7.   Being aware of others' reactions and understanding why they react as they do.
8.   Adjusting actions in relation to others' actions.
9.   Persuading others to change their minds or behavior.
10.   Bringing others together and trying to reconcile differences.
11.   Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.
12.   Analyzing needs and product requirements to create a design.
13.   Conducting tests and inspections of products, services, or processes to evaluate quality or

performance.
14. Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.
15. Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.
16. Considering the relative costs and benefits of potential actions to choose the most appropriate one.
17. Managing my own time and the time of others.
18. Determining how money will be spent to get the work done, and accounting for these expenditures.
19. Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.
20. Motivating, developing, and directing people as they work, identifying the best people for the job.

Managerial Performance

Managerial performance is measured using an eight-item scale from Mount (1984). Each item was rated on a 6-point Likert type scale (0=Not Sure/Does Not Apply; 1=Consistently performs way below expectations; 2=Consistently performs below expectations; 3=Consistently performs at expectations; 4=Consistently performs above expectations; 5=Consistently performs way above expectations).

1. Serves as a resource that others can rely on for technical advice.
2. Processes paper work quickly, accurately, and with close attention to details.
3. Assures the proper orientation and training of new employees.
4. Provides clear instructions and explanations to employees when giving work assignments.
5. Conducts performance appraisals regularly with each employee.
6. Encourages employees to reach high standards of quality and quantity.
7. Applies innovative procedures to accomplish assignments.
8. Exercises tact and sensitivity when dealing with others.