The Role of Learning Agility in Workplace Performance and Career Advancement

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Abstract

The present study sought to examine Learning Agility as a construct. This construct stems from a growing body of literature in the area of adult learning, career development, and industrial and organizational psychology. Learning Agility refers to an individual's ability to learn from experience in the workplace and to figure out which skills and abilities are necessary to be successful (Eichinger & Lombardo, 2000; London & Maurer, 2004, McCauley, 2001; Van Velsor, Moxley, & Bunker, 2004). This study considered the impact Learning Agility has in job performance and potential for career advancement, and examined personality traits and cognitive abilities of those who are adept at learning from experience.

A Learning Agility scale was developed based on the extant literature. The scale was embedded in a larger questionnaire that managers used to evaluate the workplace behaviors and job performance of 294 participants in the study. Personality and cognitive ability data were collected for each participant as part of an employment selection or development process conducted at an industrial and organizational psychology consulting firm in a major midwestern city. Personality traits were measured by the California Psychological Inventory (CPI; Gough, 1996) and the Hogan Development Survey (HDS; Hogan & Hogan, 1997). Cognitive abilities were measured by two forms of the Employee Aptitude Survey (EAS; Ruch, Stang, McKillip, & Dye, 1994), and the Watson-Glaser Critical Thinking Appraisal (WGCTA; Watson & Glaser, 2008).

Learning Agility scores were calculated and correlated with managers' assessments of their subordinates' current performance on the job and their potential for

advancement. Then relationships between Learning Agility scores and personality trait and cognitive ability data were examined. Results of the study indicate that Learning Agility is highly correlated with job performance and potential for advancement. However, multiple regression analyses indicated that Learning Agility was significantly predictive only of potential for advancement and not of current job performance. Further analyses to identify cognitive abilities and personality traits correlated with Learning Agility yielded no significant results, suggesting that Learning Agility may be a construct distinct from personality and cognitive ability.

TABLE OF CONTENTS

LIST OF TABLES

Chapter 1

Introduction

Cognitive ability (Schmidt & Hunter, 1998) and personality traits (Hogan, Curphy, & Hogan, 1994; Hough & Ones, 2001) are well-documented constructs used in predicting job performance and the potential for career advancement. Other variables such as practical intelligence (Sternberg et al., 2000) and goal orientation (VandeWalle, Brown, Cron, & Slocum, 1999) are also used to predict job performance. More recently, authors and researchers have begun to examine the ability to learn from experience— sometimes referred to as Learning Agility—as a predictor of job performance and career advancement (Eichinger & Lombardo, 2000; London & Maurer, 2004; McCauley, 2001; Van Velsor, Moxley, & Bunker, 2004).

Research on the Learning Agility is grounded in adult learning and development literature. Adult learning and development is a well established and researched field. At a fundamental level, literature in the field suggests that following formal education (K-12, and higher education when it is pursued), adults continue to grow and change. This growth is typically attributed to learning through experience (Hoare, 2006). Much of this learning occurs as people try to make sense out of new roles, responsibilities, and experiences that they have. Two themes of adult learning take a prominent role in the literature. First, adults tend to want to take control of their learning; they want to discern their own learning needs, create their own learning strategies, and measure their own success (Knowles, Holton, & Swanson, 2005). Second, life experiences such as career experiences act as primary learning opportunities for adults, provided those experiences are attended to and reflected upon (Merriam & Clark, 2006). Unfortunately, little

research exists that clearly describes the Learning Agility construct in terms of career performance and success or considers the psychological factors that enhance or inhibit the ability to learn from experience in a career or organizational setting.

As people progress in any career—psychotherapist, business person, public servant—they need to be able to continue to learn from experience. For example, advancement in the corporate world can be conceptualized within a model requiring people to change, develop, or transition. There is an evolution or a shift in what they value and what skills they employ as they take on new, different, or increasingly complex responsibilities (Charan, Drotter, & Noel, 2001). Advancement up the "leadership pipeline" can be jeopardized when certain developmental tasks are not fully mastered (Hogan & Hogan, 1997; Van Velsor & Leslie, 1995).

In a business setting, the necessary skills and tasks for success vary among leadership levels (individual contributor, supervisor, middle manager, executive). However, one skill appears to remain constant: the ability to learn from experience (Kaiser and Craig, 2005). This skill is variously described as learning orientation, ability to learn, learning from experience, learning from mistakes, openness to learning, and learning agility (Eichinger & Lombardo, 2000; London & Smithers, 1999; Spreitzer, McCall, & Mahoney, 1997; Wagner & Sternberg, 1990). Some research suggests that individuals who are more apt to learn from experience harness greater potential as employees, are more likely to be high performers, and are more likely to be promoted (Connolly, 2001; Dries, Vantilborgh, & Pepermans, 2010; Eichinger & Lombardo, 2004; Spreitzer et al., 1997).

As adults, people learn differently (McCall, 1988; McCall & Lombardo, 1983; Rose, Loewenthal, & Greenwood, 2005); they do not automatically learn from experience, or learn in the same way or with equal effectiveness (Knowles et al., 2005; McCall, 2004). It is unclear in the literature whether or how differences in cognitive abilities and personality factors affect an individual's ability to learn from experience. Because Learning Agility appears to be a core element of career success, there is value in determining whether there are factors that promote or inhibit the ability to learn from experience. Does intellectual ability correlate with Learning Agility? Do certain personality traits help or hinder the ability to learn from experience?

Significance of the Problem

This study was intended to contribute to the literature in psychology in a number of ways. It is worth noting that relevant research spans several disciplines within psychology: counseling and career psychology, industrial and organizational psychology, as well as adult learning and educational psychology. The present research was conducted within the context of this larger body of literature.

A review of literature focusing on Learning Agility and its relationship to job performance and career success or career advancement found little research in the area. This is surprising given the number of thought leaders in the field who are promoting the value of learning from experience in the workplace (London & Maurer, 2004; McCauley, 2001; Van Velsor, Moxley, & Bunker, 2004). The few studies that do exist define Learning Agility in diverse and broad terms. Although the results of these studies are not entirely consistent with each other, there does seem to be consensus among researchers and writers in the field that the ability to learn from experience is critical at

every job level. What is considerably less clear is whether Learning Agility is a facet of intelligence, a component of personality, a combination of both, or something entirely unto itself. Furthermore, there is disagreement as to whether Learning Agility is correlated significantly with both job performance and potential for career advancement, just one of the two, or neither. Finally, there is little discussion of how learning from experience occurs. Many writers comment on its value, but few describe the process by which learning occurs. McCauley (2001) concludes in a chapter she wrote with a call for a framework that "helps explain the individual difference variables associated with learning ability" (p. 379). The present study sought to contribute to the development of that framework.

If a reliable method of predicting performance on the job and/or potential for career advancement can be developed, it may provide a valuable tool in the selection of employees for entry-level positions and lateral hires, as well as promotions. Likewise, if certain personality characteristics or cognitive abilities can be shown to relate to Learning Agility, we may be able to draw some conclusions about how learning from experience occurs and consequently how Learning Agility might be fostered or encouraged in people who do not naturally possess those personality traits and cognitive abilities.

Statement of the Problem

To begin to address the lack of quantitative literature regarding Learning Agility and how it relates to job performance and potential for career advancement, this study sought to answer the following questions:

1. Is Learning Agility correlated with current job performance?

2. Is Learning Agility correlated with potential for future career advancement?

3. Does Learning Agility explain variance in ratings of current performance and future potential that is not explained by other factors (e.g., personality and cognitive ability data)?

4. Are selected personality traits and cognitive abilities associated with an enhanced ability to learn from experience?

Overview of the Study

The present study sought to determine whether Learning Agility can be defined as a construct distinct from intelligence and other personality variables, and also to examine factors that predict Learning Agility scores. The data were collected as part of the ongoing validation of an industrial-organizational psychology consulting firm's assessment process. As such, the data reflect authentic ratings of workplace behaviors and performance, as opposed to data collected by academic researchers in an artificial or analog setting. Criteria and predictive data from the consulting firm were used to evaluate and validate a measure of Learning Agility. The Learning Agility scale was developed based on findings from quantitative and qualitative research studies, as well as theory articles written by experts in adult development and workplace psychology. The scale was administered to managers in the form of a performance evaluation of individuals they supervise who had previously been assessed by the consulting firm. Learning Agility scores were calculated and correlated with managers' assessments of their subordinates' current performance on the job and their potential for advancement. These relationships were examined to determine whether Learning Agility accounted

for a unique portion of the variance in ratings of performance and potential. Predictive data collected during assessments of participants were regressed against Learning Agility scores to determine which personality and cognitive ability traits were correlated with Learning Agility. Predictive data included results from the California Psychological Inventory (CPI; Gough, 1996) and Hogan Development Survey (HDS; Hogan & Hogan, 1997), as well as cognitive ability data from the Employee Aptitude Survey (EAS; Ruch, Stang, McKillip, & Dye, 1994) and the Watson-Glaser Critical Thinking Appraisal (WGCTA; Watson & Glaser, 2006).

Summary of Chapters

Chapter One provides an introduction to the research study and the topic of Learning Agility in the workplace and its possible relationship with job performance and potential for career advancement. Chapter Two explores the small body of quantitative and qualitative research about Learning Agility and reviews the theoretical writing on this topic. Chapter Three describes the methodology used in the current study. Chapter Four offers a detailed account of the results of the study. Chapter Five provides a discussion of the results of the study and their implications, study limitations, and recommendations for future research.

Chapter 2

Literature Review

A limited amount of research examines the ability to learn from experience in a workplace setting. A thorough literature review uncovered only four quantitative studies that examined the role of Learning Agility in career performance and potential. Despite limited research, the ability to learn from experience is extensively written about and discussed, and most importantly promoted by a wide variety of experts who are well regarded in career development, adult learning, and executive leadership circles (e.g. London & Maurer, 2004; McCall, 2004; McCauley, 2001; Van Velsor, Moxley, and Bunker, 2004). The following literature review will begin with a discussion of the importance of Learning Agility in career advancement, explore the theoretical foundation of the Learning Agility construct as it is described by experts in the field, assess the small body of existing research on learning from experience, and then examine what is known about the correlations between intelligence and Learning Agility, and between personality traits and Learning Agility.

Importance of Learning Agility in Career Success and Career Advancement

Research indicates that anywhere from 30 to 75 percent of managers are not competent to carry out the roles they are assigned (DeVries & Kaiser, 2003; Hogan & Kaiser, 2005). Charan, Drotter, and Noel (2001) attribute this prevalence of incompetence in part to the difficulty of making transitions in a business setting where the skills and tasks necessary for success vary depending on the employee's position and leadership role. However, Kaiser and Craig (2005) showed that one skill appears to remain constant across all levels of business leadership: the ability to learn from

experience. Different writers and researchers have given this ability different names: learning orientation, ability to learn, learning from experience, learning from mistakes, openness to learning, and learning agility. The present study relies primarily on Eichinger and Lombardo's (2000) term Learning Agility. Regardless of the terminology used, a number of researchers contend that people who are more skilled at learning from experience perform better on the job and have greater potential for career advancement. (Connolly, 2001; Eichinger & Lombardo, 2004; Spreitzer et al., 1997).

Learning Agility as a key to career success. Kaiser and Craig (2005) found that learning in the workplace was a critical competency as individuals transitioned from frontline supervisors to middle managers to executives. They examined the behavioral and effectiveness ratings of 2,175 managers across three managerial levels (225 supervisors, 1,457 middle managers, and 493 executives) to determine whether behaviors associated with effectiveness differed by level. Behavioral ratings of each manager were completed by five subordinates, and overall effectiveness ratings of each manager were completed by two superiors. Exploratory factor analysis, content sort, and confirmatory factor analysis identified seven behavioral domains (learning orientation, work-life balance, decisive/action orientation, empowerment, interpersonal warmth, abrasiveness, and lack of follow through). The data were coded based on the functional level of the manager, as well as his or her age, education, salary, gender, and race.

The results of a multiple regression showed that a number of different behaviors were associated with overall effectiveness at each managerial level, but the only factor that was associated with each of the three managerial levels at a statistically significant

level was learning orientation. Kaiser and Craig (2005) indicated that learning

orientation is a combination of learning ability and adaptability. That is, people with

elevated learning orientations generally are quick to absorb information and

aggressively seek out knowledge but are flexible enough to accommodate challenges to

their knowledge base. Kaiser and Craig (2005) suggested that their findings lend

credence to the generally accepted notion that different skills and behaviors are needed

to succeed at different managerial levels (Charan et al., 2001). For example, what a

person needs to do to succeed at the supervisory level is different from what he or she

would need to do to be a successful middle manager or senior executive. Kaiser and

Craig (2005) explain that this dynamic has to do with the differing responsibilities,

functional activities, and fundamental skills associated with each level. They also

stressed the importance of learning in career advancement and success, because it was

the only factor that was associated with effectiveness at every organizational level.

While Kaiser and Craig's (2005) research provides support for the commonly

held belief that the requisite skills to be successful as a leader are different at the

supervisory, middle management, and executive levels, their research lacks some detail.

First of all, their research is unpublished; their study was presented at a professional

conference in 2005, and the presentation's slides were available on Craig's website at

North Carolina State University, so their research has not been put through the rigor of a

peer-reviewed journal submission. Their presentation lacks detail about the methods

and measures employed; all that is known is that the data come from a sample of

convenience. Because of this, a number of possible success factors are not included in

the study. For example, the role of technical skills, strategic thinking ability, prior

experience, organizational knowledge, and motivation are not considered. Effect sizes/significance levels are unclear, but Kaiser and Craig (2005) report that nearly all the correlations are statistically significant, and most notably, that learning orientation is the only factor that is positively and significantly correlated with success across all three leadership levels, lending credence to the importance of that factor in professional success. Unfortunately, Kaiser and Craig's (2005) research provides little insight into what factors contribute to a strong learning orientation. While we might conclude that it is helpful to maintain an active learning orientation, or that it is important that individuals learn from experience, we have no sense what it actually means to learn from experience in the context of their study.

Failure to adapt causes derailment. Considering the relationship of learning from experience and career success from the other side, Van Velsor and Leslie (1995) wrote about executive derailment. Derailed leaders are people who are successful up to a point in their careers but who ultimately fail. They are executives who are demoted or terminated, have plateaued (e.g., are ignored in a "dead end" job), or are forced into early retirement (Jones & Lewis, 2005). Van Velsor and Leslie's (1995) qualitative study of American and European managers identified four enduring themes across the derailment literature: "problems with interpersonal relationships, failure to meet business objectives, failure to build and lead a team, and an inability to change or adapt during a transition" (p. 63). In particular, they noted that "almost two-thirds of…managers who derailed [in 1993-1994] were described as being unable to change or adapt" (Van Velsor & Leslie, 1995, p. 68). While it is certainly not the only derailer, it could be argued that failure to adapt during a transition is the negative corollary of

Kaiser and Craig's (2005) finding that the only behavior associated with success at every organizational level was learning orientation, which they partially define as adaptability.

Although Van Velsor and Leslie's (1995) research arguably supports the need to be learning agile in order to avoid the most common form of derailment, particularly at times of career transition, the study lacks detail. It is published in the Academy of Management Executive, which is more of an industry publication than a scholarly journal, meaning that little focus is placed on the methods behind findings presented in the publication. As a result, the article includes little information about the sample or how the qualitative interviews were conducted, much less how they were analyzed. Part of the researchers' motivation was to see whether the derailing themes from the early 1980s (a body of literature that Van Velsor contributed to) were still pertinent in the mid-1990s. While their findings were consistent (they found no new derailer concepts), it is entirely possible that preconceived notions about derailment may have influenced the qualitative analysis of the interviews. In other words, they may have found what they were looking for, because they knew what they were looking for.

Despite some concerns about Kaiser and Craig (2005) and Van Velsor and Leslie's (1995) studies, both do shed some light on a phenomenon that perhaps lacks research but is generally accepted by scholars and professionals in the workplace. To borrow a phrase from the title of Marshall Goldsmith's 2007 best-selling book: *What got you here won't get you there.* If that is true, it would be helpful to figure out what skills and abilities help people successfully advance their careers. A number of researchers suggest that Learning Agility is one of the keys to navigating career

transitions and advancing in the workplace (e.g.,Eichinger & Lombardo, 2004; Spreitzer et al, 1997).

Theoretical Foundation of Learning Agility Construct

The theoretical foundation for the Learning Agility construct as it relates to job performance and career potential is rooted primarily in the leadership development literature. Scholars interested in leadership development write about the characteristics of leaders and the factors that enhance their ability to advance their careers. These authors look at what allows people to move forward as leaders and develop new skills and abilities in light of changing circumstances in the workplace. Learning is a central element of leadership development, and the three papers that follow all describe characteristics of people with a strong Learning Agility. These authors formulate a picture of the Learning Agility construct.

McCauley (2001) writes specifically about the ability to learn as it relates to job performance and career advancement. Having developmental experiences on the job is critical to career advancement, but those experiences are of little use unless something is learned from them. McCauley (2001) describes the common characteristics of employees who are skilled at learning. First and foremost, employees adept at learning have a strong learning orientation; they see life and work as a series of "ongoing learning experiences" which they take responsibility for and seek out for purposes of personal development. Second, these individuals take a "proactive stance toward problems and opportunities" (McCauley, 2001, p. 368). They like to engage in problem solving, are action oriented, and take initiative to accomplish their learning goals. Third, they reflect upon their experiences. They examine their assumptions and methods and

are critical of their problem-solving techniques. They attempt to understand unexpected results—they want to know why things are the way they are. Finally, they are open to ideas and perspectives. McCauley (2001) suggests that people adept at learning are open to the viewpoints of others, sensitive to cultural differences, and willing to adjust their behavior in response to the environment.

McCauley (2001) believes that selecting employees based on Learning Agility is important because employees "early in their careers have not had the opportunity to learn the skills and abilities they will need as senior managers….But if they have high learning ability, they are more likely to develop executive competencies" (p. 370). As noted in Chapter One, McCauley (2001) suggests that what is needed is a framework that describes the traits and abilities that are related to Learning Agility. The present study was an attempt to contribute to that framework.

London and Maurer (2004) also describe the characteristics of employees who are skilled learners. They suggest that people with high Learning Agility set challenging learning goals for themselves and have confidence in their ability to improve themselves in pursuit of their goals (London & Maurer, 2004). Strong learners are able to set these learning goals because they are self-aware and understand their own strengths and weaknesses, which they use to establish goals for personal development (London & Maurer, 2004). They also value feedback—they seek it out intentionally, reflect on it, process it mindfully, and feel obligated to take it into account when acting in the future. Additionally, people who are adept at learning also work to minimize defenses that inhibit learning, such as "fear of disapproval, being weak, being

dependent, being evaluated, and challenging authority" (London & Maurer, 2004, p. 231).

Van Velsor, Moxley, and Bunker (2004) describe people who are skilled at learning in the workplace as accepting responsibility for their own development and effectiveness, indicating that these people are aware of their strengths and weaknesses and establish learning goals that develop their shortcomings and play to their strengths. To that end, they are willing to expose themselves to experiences that require skills they have not developed in an effort to improve themselves. Van Velsor et al. (2004) go on to suggest that these individuals monitor everyday experiences with an eye toward learning what is needed to be successful. That is to say they reflect on and process the learning from daily experiences and attempt to learn and develop despite mistakes and setbacks. Because they are reflective and self-aware, these individuals recognize when current tactics are failing or when current strengths are not sufficient; they are able to detect when new behaviors or tactics are necessary. This self-awareness also allows them to understand how aspects of personality, values, and interests inform current strengths and sometimes get in the way of adopting different learning and problem-solving approaches (Van Velsor et al., 2004).

Summary of Theoretical Foundation of Learning from Experience

The scholars cited in this chapter paint a similar picture of the person who is learning agile. He or she actively pursues development opportunities and directs his or her own learning. Those strong in Learning Agility seek out new experiences and have a strong desire to learn. They are curious and inquisitive. They are open minded and open to new experiences. As they are developing, they seek feedback from others,

which they reflect on and integrate into new behaviors and approaches. They are flexible and willing to change their approach to a problem or situation when it is not working. Moreover, they are aware of their strengths and weaknesses and how these factors influence the ability to learn from experience.

Quantitative Research Related to Learning Agility and Performance/Potential

Despite the fact that many people are writing about Learning Agility, very few quantitative research studies examining the construct have been published. Only four studies were identified that consider the relationship between Learning Agility and employee performance and/or potential for advancement.

Learning Agility construct. Eichinger and Lombardo (2000) labeled their version of learning from experience as "Learning Agility," which they defined as the "willingness and ability to learn new competencies in order to perform under first-time, tough, or different conditions" (p. 323). They created the Choices Questionnaire to measure an individual's potential to learn from experience and perform in new situations. The Choices Questionnaire is a 76-item behavioral questionnaire that is completed by someone who knows the person well, typically a supervisor or a long-time colleague. The questionnaire was based on content analysis of executive interviews and survey data to create items that were either "explicitly learning-oriented or required learning in order to perform under first-time conditions" (Eichinger & Lombardo, 2000, p. 324). Across two validation studies, more than 400 questionnaires were completed. Factor analysis of the results suggested that the Learning Agility construct was composed of four factors: people agility, results agility, mental agility, and change agility.

Individuals with high people agility "know themselves well, learn from experience, treat others constructively, and are cool and resilient under the pressures of change" (Eichinger & Lombardo, 2000, p. 324). People with results agility "get results under tough conditions, inspire others to perform beyond normal, and exhibit the sort of presence that builds confidence in others" (Eichinger & Lombardo, 2000, p. 324). Those with mental agility "think through problems from a fresh point of view and are comfortable with complexity, ambiguity, and explaining their thinking to others" (Eichinger & Lombardo, 2000, p. 324). Individuals adept in change agility "are curious, have a passion for ideas, like to experiment with test cases, and engage in skill-building activities" (Eichinger & Lombardo, 2000, p. 324). All four factors together correlated significantly with high ratings of performance and high ratings of potential by supervisors ($r = .30$, $p < .001$ for both).

Unfortunately, Eichinger and Lombardo (2000) do not provide sufficient information about their methodology to evaluate the quality of their findings. Instead, they encourage readers to contact Dr. Lombardo for a technical summary of the research studies, which the present investigator attempted without success. Perhaps the most notable criticism of Eichinger and Lombardo's (2000) research is the broad nature of their construct of Learning Agility. According to their factor analysis, Learning Agility—learning from experience—is a combination of being relationship oriented and self-aware (people agility), motivated for success (results agility), intellectually quick (mental agility), and curious and creative (change agility). Furthermore, they suggest that a person need only excel in one area to be considered learning agile. Their construct is so broad that almost anything could be considered Learning Agility. At the same

time, they contend that their construct is distinct from intelligence and personality, although research examined below seems to call that statement into question.

Validation of learning agility construct. Connolly (2001) examined the validity of Eichinger and Lombardo's (2000) construct of Learning Agility by examining the construct against a measure of cognitive ability and two personality measures, as well as correlations between Learning Agility and job performance and between Learning Agility and job promotability (potential). Connolly (2001) found that Eichinger and Lombardo's (2000) Choices Questionnaire tapped a construct that was distinct from cognitive ability and personality and predicted both job performance and job promotability better than either personality or cognitive ability did. This finding lends support for the construct and for the contention that learning from experience plays an important role in job performance and potential.

Connolly (2001) asked 107 police officers to complete the Watson Glaser Critical Thinking Appraisal (WGCTA; Watson & Glaser, 1994) to measure critical thinking ability; the International Personality Item Pool (IPIP; Goldberg, 1999), to measure personality on the Big Five dimensions of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness; and a 16-item unnamed goal-orientation measure developed by Button, Mathieu, and Zajac (1996). Connolly asked two co-workers and a supervisor to complete the Choices Questionnaire about the target officer, and the supervisor also completed a job performance evaluation form with 11 performance dimensions, 1 overall performance judgment, and 1 promotability rating. Connolly (2001) found nonsignificant relationships between Learning Agility and cognitive ability ($r = .08$) as well as the Big Five personality factors (r ranged from -.06

to .13). Connolly suggested these findings represent discriminant validity for the construct of Learning Agility. He found that Learning Agility correlated with supervisor ratings of promotability ($r = .40$, $p < .01$) and ratings of overall job performance ($r = .37$, $p < .01$). This research offers strong support for the construct of Learning Agility.

It is worth noting that the Learning Agility sub-factor called mental agility had a small but significant correlation with openness to experience ($r = .21$, $p < .05$), as did the change agility sub-factor ($r = .23$, $p < .05$) (Connolly, 2001). Finally, it is important to report that analysis meant to validate the four-factor structure of the Learning Agility construct found that the correlations between the factors ranged from $r = .80$ to $r = .90$ (Connolly, 2001). Accordingly it may be best to think of Learning Agility as only a one-factor model.

While Connolly's (2001) study has many strengths, there are a number of factors that limit the generalizability of the findings. First, his study focused on law enforcement officers. They work in a field that values following orders and standard operating procedures. Perhaps it is not the best sample to broadly understand employee performance and potential. There is also a question about whether the Watson Glaser is an appropriate measure of general mental ability or whether it is a better representation of critical thinking skills, which may correlate with, but represent only one component of general mental ability. Finally, there is the question of whether Learning Agility is a single construct or a four-factor construct. If it is indeed a one-factor construct, how should significant correlations with previously identified sub-factors be interpreted? On one hand, Connolly (2001) concludes that Learning Agility is a construct unto itself (overall, it does not correlate with intelligence or personality factors in his study). At the

same time, two of Eichinger and Lombardo's (2000) four sub-factors do correlate with the personality factor known as openness to experience. This inconsistency leaves the answer to the question of whether personality factors are correlated with Learning Agility somewhat murky.

Learning Agility as a predictor of career potential. Spreitzer, McCall, and Mahoney (1997) studied expatriot (international) job assignments and concluded that learning from experience was key to successful international job placement. They used Prospector, a 116-item instrument, to rate potential executives on both "end-state competencies and the ability to learn" (Spreitzer et al., 1997, p. 6). End-state competencies included the following: sensitivity to cultural differences, business knowledge, courage to take a stand, brings out the best in people, acts with integrity, is insightful, is committed to success, and takes risks. Ability to learn dimensions included the following: uses feedback, is culturally adventurous, seeks opportunities to learn, is open to criticism, seeks feedback, and is flexible. Spreitzer et al. (1997) asked executives from six international companies to identify lower, middle, and senior managers who were in or were positioned for jobs that were international in scope. Approximately 1,100 managers from 21 countries were identified in this process and each of their immediate supervisors was asked to complete the Prospector evaluation and criterion-related ratings for their identified manager. The researchers received 838 completed surveys (Spreitzer et al., 1997).

Regression analysis was used to determine whether the factors measured by Prospector were useful for predicting current performance or future potential. The results indicated that the end-state competencies were significantly related to current

performance but none of the ability to learn dimensions was related to current performance. Spreitzer et al. (1997) suggested that these results meant that supervisors did not take learning into account when assessing current performance. End-state competencies and ability to learn dimensions were both found to predict career potential. Perhaps more importantly, both dimensions were able to discriminate between managers "identified by their organizations as high potential [for advancement] and those identified as solid performers but not likely to advance" (Spreitzer et al., 1997, p. 24). This finding suggests that while Learning Agility may not factor into a supervisor's assessment of current performance, it plays an important role in an individual's perceived ability to advance up the corporate ranks. This finding seems to support Eichinger and Lombardo's (2000) finding that Learning Agility is correlated with high potential, but contradicts their finding that Learning Agility is correlated with current performance. This finding also lends credence to Kaiser and Craig's (2005) notion that Learning Agility is key to successful advancement.

Spreitzer et al. (1997) appear to have done a thorough job of analyzing their data. Their analysis seems to be well conceived and executed. Of some concern is the lack of a randomly generated sample, although this is a problem that is hard to avoid in studies of this type. The target managers were identified by their organizations, and it is not clear what selection methods each corporation employed to target managers for the study. This methodology limits the generalizability of the findings. Furthermore, the study is focused specifically on managers working in an international setting or in a domestic setting with sizable international responsibilities. It is possible that the learning orientation necessary for success in an international setting differs from what is

necessary in other (e.g., domestic) managerial settings. Nonetheless, Spreitzer et al. (1997) concluded that at least in an international context, an ability to learn from experience plays an important role in predicting future career potential.

Learning Agility as a predictor of high-potential employees. Dries, Vantilborgh, and Pepermans (2010) conducted a study in which they sought to identify differences between high performing employees and high potential employees. They found that Learning Agility predicted employee potential above and beyond job performance (Dries et al., 2010). Research suggests that as many as 71% of high-performing employees are not high-potential employees (Corporate Leadership Council, 2005). While those employees performed well at one level, they had limited success at the next level for a variety of reasons. However, the Corporate Leadership Council (2005) found that 93% of high-potential employees were high performers. The message is reiterated again: high performance at one level does not necessarily translate to high potential for success at another level. Unfortunately, research has demonstrated that organizations tend to identify their high-potential employees based on their current performance (Briscoe & Hall, 1999; Dries & Pepermans, 2008). The good news, according to Dries et al. (2010), is that Learning Agility is an excellent predictor of potential, suggesting that it is a viable alternative to identifying high-potential employees based on their current job performance.

Dries et al. (2010) asked 63 supervisors from seven organizations to complete a survey about one of their subordinates. Half of the supervisors rated a subordinate that their company had identified as a high-potential employee, and half rated subordinates who were not identified as high-potential employees. A stepwise linear regression

analysis was used to determine whether supervisor ratings could distinguish between high-potential and non-high-potential employees. The first prediction model included only job performance and resulted in a statistically significant finding ($p < .01$), suggesting that job performance by itself could discriminate between high potentials and non-high potentials; it successfully placed 66.7% of the subordinates in their classifications. However, when Learning Agility was added to the second prediction model, performance of the model was significantly improved ($p < .001$). This model successfully placed 77.8% of subordinates into high-potential or non-high-potential categories. Furthermore, the contribution of job performance in the second model was insignificant—Learning Agility was the only significant contributor to the prediction of high- or non-high-potential employees (Dries et al., 2010). These results seem to align well with the findings of Spreitzer et al. (1997) that Learning Agility predicts potential. Moreover, it takes the research one step farther by showing that Learning Agility can be used to discriminate between high-potential and non-high-potential employees.

One potential limitation of the Dries et al. (2010) research is that the organizations classified subordinates as high-potential or non-high-potential without any external criteria from the researchers, meaning that a person considered high-potential at one organization may not be considered high-potential at another. Furthermore, it may not be surprising to find a Learning Agility difference between an organization's employees with the highest potential and those with the lowest potential. Likewise, a halo effect could have influenced ratings of high-potential subordinates depending on how the survey instructions were presented to supervisors. It would have

been helpful to have more information about the how rating instructions were presented to managers.

      Summary of existing research on learning from experience. The findings of the studies of the concept of Learning Agility have produced mixed results. Eichinger and Lombardo's (2000) construct includes four factors, and their research suggests that this construct is not related to intelligence or personality, but it does predict job performance and potential. Connolly (2001), who sought to validate Eichinger and Lombardo's (2000) construct, found that Learning Agility predicted performance and promotability, but he also found that the four factors were highly interrelated and actually were better thought of as a single factor. Connolly (2001) also found that some of Eichinger and Lombardo's (2000) sub-factors are significantly correlated with openness to experience. Spreitzer et al. (1997) concluded that learning orientation is not predictive of current performance—a contradiction of Eichinger and Lombardo's (2000) and Connolly's (2001) results—but their findings corroborate those researchers' conclusions that Learning Agility is associated with long-term potential/promotability. Finally, Dries et al. (2010) found that Learning Agility does predict potential, and actually is a better predictor of potential than performance, lending credence to the importance of Learning Agility in making career transitions. These results are consistent with the findings of Kaiser and Craig (2005) and Van Velsor and Leslie (1995).

      Together with the theoretical literature described earlier in the chapter, the quantitative evidence paints a picture of what Learning Agility looks like in a workplace setting. This picture suggests that Learning Agility is a major key to career advancement and that it is correlated with job potential and possibly with current

performance. What remains uncertain is whether cognitive ability and/or personality traits are correlated with the ability to learn from experience.

Cognitive Ability Correlates of Learning from Experience

Intellectual ability has long been the gold standard for predicting job performance (Schmidt & Hunter, 1998), but there is little research that connects intellectual ability with Learning Agility. It seems intuitive that more intelligent people would have an easier time learning from experience, because they can rely on their intellect to help them understand and navigate unfamiliar waters. Yet, we all know people who excel in academic settings where the expectations are defined by others, namely teachers and professors, but struggle when faced with the challenges and ambiguity of the "real world" (Sternberg, Wagner, Williams, & Horvath, 1995). As noted above, Connolly (2001) found that Eichinger and Lombardo's (2000) concept of Learning Agility was not correlated with results from the Watson-Glaser Critical Thinking Appraisal (Watson & Glaser, 1994). It is not clear whether other measures of general intelligence are associated with the ability to learn from experience or whether alternative forms of intelligence, such as practical intelligence (Neisser, 1976; Sternberg, Wagner, Williams, & Horvath, 1995), emotional intelligence (Goleman, 1995), or one or more of Gardner's (1983) multiple intelligences, are associated with the ability to learn from experience.

Cognitive ability as a predictor of job performance and knowledge acquisition. Schmidt and Hunter's (1998) meta-analysis sits atop the well-supported and often-cited research finding that general mental ability (GMA) is the strongest predictor of job performance and acquisition of job knowledge. These researchers

examined the mean validity of 19 different selection methods used to predict job performance. They concluded that GMA "occupies a special place" in performance prediction because "it has the highest validity and lowest application cost" (Schmidt & Hunter, 1998, p. 264). They found GMA to have a predictive validity of .51, just behind work sample tests ($r = .54$), which they acknowledged were slightly more valid but considerably more expensive and could "be used only with applicants who already know the job or have been trained for the occupation or job" (p. 264). In the same study, Schmidt and Hunter (1998) reported that GMA was also the best predictor of "job knowledge acquisition" ($r = .56$).

Unfortunately, Schmidt and Hunter (1998) did not define job knowledge acquisition. Within the article, they variously referred to it as "training performance," "acquisition of job knowledge on the job," and "future job-related learning." The latter two sound very much like learning from experience, but they are never described in more detail or distinguished more clearly from training performance, which sounds like a measure of performance in formal job training programs (e.g., classroom-based corporate training programs). That said, Schmidt and Hunter (1998) concluded that when an employer uses tests of GMA to hire employees who "will have a high level of performance on the job, that employer is also selecting those…who will acquire job knowledge faster from experience on the job" (p. 266). They seem to suggest that some element of learning from experience is correlated with GMA. Yet, there is not sufficient data presented in their article to draw a firm conclusion about the difference between Learning Agility and learning from career training programs. Nonetheless, a hint of a possible correlation between Learning Agility and GMA seems to exist.

A notable limitation of the Schmidt and Hunter (1998) meta-analysis is that it only examined the 19 selection methods in isolation and in pairs that always include GMA. They never considered the predictive validity of three or more predictors, and more importantly, they never considered the predictive validity of pairs of predictors that do not include GMA. It is possible that when paired together, work sample tests (r = .54) and integrity tests (r = .41) might have a multiple R greater than any of the pairs of predictors that included GMA. Of course, Schmidt and Hunter's (1998) study is also vulnerable to all "traditional" criticisms of meta-analysis. In particular, they were looking at data from a 20-year period that measured cognitive ability with a wide variety of methods, not all of which are equally valid. Likewise, the criterion of job performance was measured with methods as varied as supervisory ratings to production records to sales records—these three rating methods cannot necessarily be equated. An element of publication bias may also have skewed their findings.

Learning Agility distinct from cognitive ability. Contrary to Schmidt and Hunter (1998), Connolly (2001), as noted above, found that cognitive ability and Learning Agility were not correlated significantly, but suggested that "learning agility may fall into the realm of noncognitive constructs relating to adaptability and knowledge acquisition" (2001, p. 47). Beyond that, Connolly (2001) found that Learning Agility predicted both performance and promotability above and beyond cognitive ability and personality factors. He found that Learning Agility accounted for 11% of the variance in supervisor ratings of performance above and beyond cognitive ability and personality factors and 10% of the variance in supervisor ratings of

promotability above and beyond cognitive ability and personality factors (Connolly, 2001).

With Connolly's (2001) research as their foundation, Eichinger and Lombardo (2004) furthered the argument that Learning Agility is a construct distinct from intellectual ability and has more to do with "personal adaptability" than GMA. They contend that Learning Agility is related to an individual's ability to adapt to the environment to achieve goals. This understanding of Learning Agility seems to share a number of characteristics with the Sternberg et al. (1995) concept of practical intelligence, including the suggestion that it predicts job performance above and beyond GMA.

Practical intelligence, tacit knowledge, and cognitive ability. Sternberg et al. (1995) wrote a then-comprehensive review of what was known about practical intelligence and tacit knowledge. They define practical intelligence as "street smarts," as opposed to academic intelligence, or "book smarts," which they contend is typically measured by intelligence tests. They incorporate elements of Polanyi's (1976) concept of tacit knowledge into practical intelligence. Tacit knowledge is described as being "action-oriented knowledge, acquired without direct help from others, and allows individuals to achieve goals they personally value….it is called tacit because it often must be inferred from actions or statements" (Sternberg et al., 1995, p. 916). This concept clearly adopts the tone of Learning Agility.

Consistent with Connolly's (2001) finding that Learning Agility is not associated with measures of general mental ability, Wagner and Sternberg (1985) found that practical intelligence was not correlated with GMA. They administered the Verbal

Reasoning subtest of the Differential Aptitude Tests and a measure of tacit knowledge related to work situations to a group of 22 Yale undergraduates. The correlation between the verbal intelligence measure and the tacit knowledge measure was .16 ($p >$ .05), indicating that tacit knowledge is not related to verbal intelligence. Wagner and Sternberg (1985) go on to state that previous research by Sternberg (1980, 1981) suggests that the magnitude of correlations between the verbal reasoning subtest and measures of general intelligence have been in the range of .4 to.7 with samples of Yale undergraduates. Their conclusion is that practical intelligence is distinct from both verbal reasoning and general intelligence. If learning from experience and practical intelligence are similar constructs, then this finding is consistent with Connolly's (2001) finding that GMA and Learning Agility are not correlated.

There are several limitations to Wagner and Sternberg's (1985) study. First and foremost is the very small sample size ($n = 22$). Also of concern is the likely restricted range of Yale undergraduates' verbal ability, as well as the relatively little tacit knowledge related to work situations that they would be expected to have developed. Yale undergraduates would be expected to have high verbal scores, and lower tacit knowledge scores, at least when the tacit knowledge being measured is related to work situations. Given the sample, it is not surprising that no significant correlation was found.

Tacit knowledge as a predictor of job performance. Consistent with Eichinger and Lombardo (2000) and Connolly (2001), Wagner and Sternberg (1990) found that tacit knowledge predicts job performance above and beyond GMA alone. Wagner and Sternberg (1990) administered the Tacit-Knowledge Inventory for

Managers (TKIM; Wagner & Sternberg, 1990), the Shipley Institute of Living Scale (a measure of general intelligence) (SILS; Shipley, 1940), the California Psychology Inventory (CPI; Gough, 1996), the Myers-Briggs Type Indicator (MBTI; Myers, McCaulley, Quenk, & Hammer, 1998), the Fundamental Interpersonal Relationship Orientation-Behavior (FIRO-B; Ryan, 1977), and a job satisfaction questionnaire to 45 Leadership Development Program participants at the Center for Creative Leadership. They also observed and rated the participants in two managerial simulations. Analysis indicated that the best predictor of performance in the managerial simulations was tacit knowledge ($r = -.61$, $p < .001$). The correlation between IQ scores and performance was .38 ($p < .001$). However, the correlation between tacit knowledge and IQ was nonsignificant ($r = -.14$, $p > .05$). Wagner and Sternberg (1990) also paired the measure of tacit knowledge with other predictors to determine the incremental validity tacit knowledge provided to each predictor. The change in R-square when tacit knowledge was incorporated with other variables as a predictor ranged from .22 to .35 all with p-values significant at or below .01. These results suggests the tacit knowledge construct is measuring something different from the cognitive ability and personality trait measures that were also administered as part of the study.

Tacit knowledge and learning agility. Armed with Wagner and Sternberg's (1990) conclusion that practical intelligence is a construct distinct from GMA, Williams (1991) conducted an interesting study that helps create some connections between the work of Kaiser and Craig (2005) and Eichinger and Lombardo (2000) and provides further evidence that tacit knowledge may be closely related to the construct of Learning Agility. Williams (1991) constructed general- and level-specific tacit

knowledge measures and administered them to managers at four high-tech

manufacturing companies in Connecticut. She examined outstanding and

underperforming managers at the supervisory ($n = 42$), middle manager ($n = 49$), and

executive level ($n = 18$). She used the two groups of managers at each level to discern

the tacit knowledge needed to be successful at each level by examining what

outstanding managers knew that their underperforming colleagues did not. Consistent

with Kaiser and Craig's (2005) findings that different skills are necessary at different

levels, Williams (1991) found that different tacit knowledge was required at each

managerial level and that possession of that knowledge was positively correlated with

job success. Furthermore, she found that when education and years of experience were

controlled, tacit knowledge explained a significant share of variance in success.

Because experience was controlled for, it can be concluded that job experience by itself

does not result in the accumulation of tacit knowledge. This finding begs the question of

why some individuals have more success developing tacit knowledge than others. In the

context of this paper, a question is: Are there any traits or factors that encourage or

inhibit Learning Agility?

Two key limitations of Williams' (1991) study concern generalizability of

findings due to both the construction of the tacit knowledge measure and the

occupational constraints. Williams would likely agree that tacit knowledge measures are

highly job specific and highly setting specific. That is, the instruments are used to

measure the practical know-how that people generally pick up with experience in a

particular occupational field. Likewise, what it takes to succeed in a given job varies

from company to company and industry to industry, making generalization of, much

less replication of the findings obtained by Williams' (1991) nearly impossible. These limitations call into question the breadth of conclusions that can be drawn about tacit knowledge as a construct.

Summary of learning from experience and cognitive ability research. Similar to the research specifically about Learning Agility, the literature cognitive ability and workplace performance and potential is mixed. Schmidt and Hunter (1998) suggested that GMA is correlated with job knowledge acquisition, which sounds like learning from experience, but is never clearly defined. In contrast, Connolly (2001) found no correlation between GMA and Learning Agility. At the same time, the construct that Eichinger and Lombardo (2000) describe as Learning Agility sounds very much like Sternberg et al.'s (1995) description of practical intelligence, both of which predict job performance and promotability, and neither of which correlated significantly with GMA. In the end, it is difficult to tell whether there is a difference among these constructs. Is job knowledge acquisition the same thing as Learning Agility, and is Learning Agility the same thing as practical intelligence? All three seem to be somewhat similar, and the latter two share significant correlations with job performance and promotability.

Personality Trait Correlates with Learning from Experience

Personality variables often influence interpersonal strategies that people use to relate to others (Davis & Barnett, 2010). Most of the personality research conducted in workplace settings examines the same Big Five dimensions: agreeableness, extraversion, emotional stability (or neuroticism), openness to experience, and conscientiousness (Hogan, Hogan, & Roberts, 1996). This body of research has found

strong relationships between personality and job performance (Bono & Judge, 2004; Hogan & Kaiser, 2005; Hough & Ones, 2001; Ng, Eby, Sorensen, & Feldman, 2005). Despite a great deal of research that correlates personality variables with job performance, there is scant research that looks at personality variables and the ability to learn from experience. Much of this section uses existing research to hypothesize about the relationship between personality and Learning Agility.

Openness to experience. The conventional wisdom of experts in the field of adult learning and leadership development is that openness to experience is related to Learning Agility. London and Smithers (1999) suggest that individuals with high levels of openness to experience will cultivate opportunities to learn and will engage in "continuous learning" (p. 10). Likewise, Davis and Barnett (2010) contend that the resourcefulness, imagination, intellectual curiosity, and flexibility of those who are most open to experience should promote greater learning and development. Presumably those same qualities would fuel opportunities to learn from experience.

In his validation study of the Learning Agility construct Connolly (2001) found a small but significant correlation with openness to experience but not with other Big Five personality dimensions. Connolly (2001) found the mental agility sub-factor of Learning Agility had a small but significant correlation with openness to experience ($r = .21$), a dimension measured by the IPIP (Goldberg, 1999), as did the sub-factor called change agility ($r = .23$). These findings are perhaps not surprising given that Eichinger and Lombardo (2000) describe individuals with Learning Agility as being open to different types of people and ideas. What is somewhat more surprising is that other relationships with personality were not found, since Eichinger and Lombardo (2000)

also describe those with heightened Learning Agility as knowing themselves well, being results oriented, and being comfortable with ambiguity, among other descriptors, many of which seem to be compatible with at least one of the Big Five dimensions.

Consistent with Connolly's (2001) findings, Major, Turner, and Fletcher (2006) found that openness to experience correlated significantly ($r = .42$, $p < .05$) with motivation to learn. Motivation to learn was defined as a "desire to engage in training and development activities, to learn training content, and to embrace the training experience" (Major et al., 2006, p. 927). While motivation to learn is not the same as Learning Agility, they are likely related constructs. Presumably people who are gifted at learning are also often motivated to learn. This may suggest that those who are more open to experience are more learning agile. It should be noted that Major et al. (2006) also found significant correlations between motivation to learn and extraversion ($r = .39$, $p < .05$) and conscientiousness ($r = .42$, $p < .05$).

Conscientiousness. Experts writing about Learning Agility suggest that highly conscientious people are likely to set their own goals, work diligently to achieve those goals, and are likely to feel obligated to make changes to their behavior based on feedback (Davis & Barnett, 2010; Smither, London, & Reilly, 2005). While these characteristics do not necessarily equate to learning from experience, it seems likely that conscientious people might be predisposed to learn more or learn better from experience than less conscientious individuals.

Barrick, Mount, and Strauss (1993) found that conscientiousness was significantly correlated to goal setting ($r = .39$, $p < .01$) and goal commitment ($r = .35$, $p < .01$) in their study of study of 91 sale representatives from a large appliance

manufacturing company. The authors concluded that conscientious employees are "more likely to set goals, are more committed to goals once goals are established, and perform better as a result" (Barrick et al., 1993, p. 721). Unfortunately, setting goals is likely only a single, albeit helpful component of learning in the workplace, but when coupled with being committed to and following through on goals, conscientiousness could arguably play a major role in predicting the ability to learn from experience.

Extraversion. Writers and researchers in adult learning and development suggest that extraversion enhances learning opportunities. Some research suggests that extraverts solicit more feedback from others (Smither et al., 2005), their energy and activity levels make it easier for them to seek out learning opportunities (Davis & Barnett, 2010), and they tend to share their new knowledge with others (Hoare, 2006).

Judge, Bono, Ilies, and Gerhardt's (2002) conducted a meta-analysis of 73 studies of leadership and personality traits and found that extraversion was significantly correlated with leader emergence ($r = .33$, $p < .05$) and leadership effectiveness ($r = .24$, $p < .05$). While emergence and effectiveness are not the same as learning from experience, Kaiser and Craig's (2005) research would suggest that Learning Agility is a necessary component of leader emergence (potential) and effectiveness (performance) in as much as Learning Agility is a necessary component for making transitions and executing new duties and responsibilities. Therefore, it could be argued that higher levels of extraversion ought to correlate with higher levels of Learning Agility.

Agreeableness. An individual's level of agreeableness seems to have little to do with Learning Agility. London and Maurer (2004) acknowledge that effective interpersonal skills are valued in the workplace, and research by Barrick, Stewart,

Neubert, and Mount (1998) found that in teams where a high level of cooperation is required to achieve goals, agreeableness was related to supervisor ratings of team performance. While agreeableness is generally recognized as a desirable trait in the workplace, there does not seem to be any research or hypotheses by experts in the field suggesting agreeableness is or should be strongly related to Learning Agility.

Neuroticism. The opposite of neuroticism is emotional stability, and it seems logical to assume that individuals free of significant psychological issues would be better suited to learn from experience. Davis and Barnett (2010) suggest that "emotionally stable and confident people are more likely to tolerate their own failures and shortcomings, learn from mistakes, and appreciate feedback from others" (p. 370). It is not difficult to argue that individuals with those traits would have a significant advantage when it comes to learning from experience in the workplace.

Along these lines, in a meta-analysis of 73 studies by Judge et al. (2002) found negative correlations between neuroticism and leadership emergence ($r = -.24$, $p < .05$) and leadership effectiveness ($r = -.22$, $p < .05$). This does not necessarily mean that emotional stability is correlated with Learning Agility, but if Learning Agility is an important component of leadership emergence as implied by Kaiser and Craig (2005), it might not be surprising to find a correlation between Learning Agility and emotional stability.

Personality and high-potential employees. Recalling that Eichinger and Lombardo (2000) contend that learning agile employees are high-potential employees, it is worthwhile to examine the small amount of research that describes the personality traits of high-potential employees.

Dries and Pepermans (2008) conducted a qualitative study with individuals described as "real" high potentials and found that career self-management/initiative was key to their success. Dries and Pepermans (2008) conducted 34 interviews with people employed by eight multinational Belgian corporations about their high-potential employees. They interviewed 14 high-potential employees, eight organizational representatives from companies that employed those 14, and 12 organizational representatives from companies that employed high-potential employees who were not interviewed individually. Dries and Pepermans (2008) contended that this unusual approach allowed them to gather convergent and discriminate information to determine what characteristics are most representative of high-potential employees and their career paths. They found that career self-management/initiative was central to career success of high-potential employees. Specifically, they found that high-potential employees were ambitious, had strong interpersonal skills, were loyal to their employer, and were self-directed. Although they did not tie their findings to the Big Five personality factors, other research (Corporate Leadership Council, 2005) suggests that the characteristics described by Dries and Pepermans (2008) are related to the personality traits of extraversion, conscientiousness, and agreeableness. Notably, openness to experience does not seem to be a critical component of Dries and Peperman's (2008) findings.

One limitation of Dries and Peperman's (2008) research is that the sample of 14 high potential employees which included only one female. Supposing that high-potential female employees may look different than high-potential male employees, this research may not paint a complete picture of the characteristics of high-potential employees. Additionally, this study is subject to some of the typical criticisms of

qualitative research. For example, while most of their published findings are endorsed

by more than half of the respondents, many are endorsed by a simple majority, making

it difficult to draw firm conclusions about the common characteristics of high

potentials. Furthermore, the 20 different companies represented in the study reported

very different ways of identifying and developing high potential employees, suggesting

that perhaps similarities and differences in data were skewed by different connotations

of what high potential means in each setting. Also, qualitative data are not intended to

be generalized to the population of interest.

Francis-Smythe, Tinline, and Allender (2002) conducted a quantitative study to

identify the personality characteristics of high-potential police officers in London.

Based on personality data collected from 225 police officers and ratings of potential

completed by their commanders, the researchers found that high-potential Bobbies were

open to new experiences ($r = .35$, $p < .001$), extraverted ($r = .27$, $p < .001$), and

conscientious ($r = .24$, $p < .005$). Much like Connolly's (2001) research, Francis-

Smythe et al. (2002) used a population of law enforcement officers, and it is entirely

possible the characteristics that correlate with high-potential police officers are not

necessarily the traits that correlate with high-potential employees in other settings. Most

of Eichinger and Lombardo's work has been done in business settings, and it is possible

that different personality traits are necessary to succeed in those settings.

Bearing in mind that Eichinger and Lombardo (2000) argue that learning agile

employees are high-potential employees, it is logical to expect that the characteristics of

high-potential employees would correlate with the traits of those who are learning agile.

In this case, however, the descriptions of high-potential employees are not entirely

consistent. Dries and Peperman's (2008) descriptions paint high potentials as extraverted, conscientious, and agreeable, and Francis-Smythe et al. (2002) describe high potentials as being open to experiences, extraverted, and conscientious. Both studies conflict with Eichinger and Lombardo's (2000) Learning Agility construct that describes high potentials simply as open to experiences (Connolly, 2001).

Personality traits as barriers to learning from experience. Hogan and Hogan's (1997) research does not address personality traits and Learning Agility directly, but they do suggest that certain excessive tendencies or traits could be negatively correlated with learning and development. The Hogan Development Survey (HDS; Hogan & Hogan, 1997) describes 11 "dysfunctional dispositions" that are based on Axis II personality disorders from the DSM-IV-TR (Hogan, Hogan, & Warrenfeltz, 2007). The HDS measures interpersonal tendencies that might keep an employee from getting along with others or advancing in the workplace. For example, Hogan and Hogan (1997) describe excessively "bold" individuals as potentially resistant to negative feedback or unwilling to listen to criticism. People who are elevated on the "reserved" scale are likely to misinterpret feedback and misread social cues, which would logically hinder their ability to learn from experience. Likewise, excessively "leisurely" individuals may tend to ignore constructive criticism and may be difficult to coach because of a lack of follow through (Hogan & Hogan, 1997).

By the very nature of the HDS, Hogan and Hogan (1997) do not offer any possible factors that may predict learning from experience. However, there may be certain personality traits identified in the HDS (Hogan & Hogan, 1997) that correlate negatively with Learning Agility. No one has specifically examined the relationships

between the HDS and Learning Agility, but Hogan and Hogan's (1997) validated descriptions of the different factors in the HDS may shed some light on the kinds of personality traits that are more or less likely to correlate with learning from experience.

Summary of personality research and learning agility. Similar to research on learning from experience and mental ability, there is considerable confusion about the presence or absence of statistical relationships between personality traits and Learning Agility. Connolly (2001) suggests that there is a relationship between learning from experience and openness to experience. Yet, he fails to find any other significant relationships between Learning Agility and other personality traits. Meanwhile, Dries and Pepermans (2008) found that characteristics one might associate with extraversion, conscientiousness, and agreeableness were associated with the kind of high potential expected of those who are learning agile. However, they did not find that characteristics reflecting openness to experience, such as openness to new ideas or approaches were related to Learning Agility. While Big Five research can allow some logical inferences about positive relationships between personality and Learning Agility, Hogan and Hogan's (1997) research suggests that some personality traits may actually correlate negatively with learning from experience. All of these conflicting results serve to further muddy the relationship between Learning Agility and personality variables.

Conclusion

By and large, theorists seem to agree on the characteristics of the learning agile. Such individuals seek new experiences, look for opportunities to learn, and are inquisitive and open minded. They seek feedback, which they use to inform new behaviors. They are aware of their strengths and weaknesses and how their strengths

and weaknesses influence the ability to learn from experience. However, when the construct is operationalized by researchers, the resulting picture of Learning Agility and its correlates is not nearly as clear.

Eichinger and Lombardo (2000) contend that their Learning Agility construct is not related to intelligence or personality traits, and that it predicts job performance and potential. In seeking to validate the construct, Connolly (2001) found that some of Eichinger and Lombardo's (2000) Learning Agility sub-factors are significantly correlated with openness to experience. Spreitzer et al. (1997) found that learning-orientation is not predictive of current performance—a contradiction of Eichinger and Lombardo (2000) and Connolly's (2001) results—but that learning from experience is associated with workplace potential.

Schmidt and Hunter (1998) suggest that GMA is correlated with job knowledge acquisition, which sounds like Learning Agility, but Connolly (2001) found no correlation between GMA and learning from experience. At the same time, the construct that Eichinger and Lombardo (2000) describe as Learning Agility sounds very much like Sternberg et al.'s (1995) description of practical intelligence, both of which predict job performance and promotability, and neither of which correlate with GMA. It is difficult to tell whether there are differences between some of the constructs.

Relationships between personality traits and Learning Agility are no more clear than relationships between mental ability and Learning Agility. Connolly (2001) found a relationship between Learning Agility and openness to experience. However, Dries and Pepermans (2008) found that characteristics one might associate with extraversion, conscientiousness, and agreeableness were associated with the kind of high potential

expected of those who are learning agile. Findings from Five Factor Model personality research can be extrapolated to suggest some positive relationships between personality and Learning Agility. However, Hogan and Hogan's (1997) research suggests that some personality traits may negative correlations with learning from experience.

As clear as the construct appears to be when theorists write about it, Learning Agility quickly becomes hazy and confused when attempts are made to analyze its components and better define the term. The present study attempts to shed some light on the correlation between Learning Agility, current job performance, and potential for advancement, as well as the relationship between Learning Agility and mental ability and personality.

Present study. The present study examined the relationships between Learning Agility and job performance and career potential. With the reviewed literature as a foundation, a Learning Agility scale was developed and embedded in a larger questionnaire that managers used to evaluate the workplace behaviors and job performance of 294 participants in the study. These data were merged with previously collected personality and cognitive ability data that were collected for each participant as part of an employment selection or development process conducted at an industrial and organizational psychology consulting firm. Personality traits were measured by the California Psychological Inventory (CPI; Gough, 1996) and the Hogan Development Survey (HDS; Hogan & Hogan, 1997). Cognitive abilities were measured by two forms of the Employee Aptitude Survey (EAS; Ruch, Stang, McKillip, & Dye, 1994), and the Watson-Glaser Critical Thinking Appraisal (WGCTA; Watson & Glaser, 2008).

Learning Agility scores were calculated and correlated with managers'
assessments of their subordinates' current performance on the job and their potential for
advancement. Then relationships between Learning Agility scores and personality trait
and cognitive ability data were examined. The study sought to answer the following
research questions:

1.   Is Learning Agility correlated with current job performance?

2.   Is Learning Agility correlated with potential for future career
       advancement?

3.   Does Learning Agility explain variance in ratings of current performance
       and future potential that is not explained by other factors (e.g.,
       personality and cognitive ability data)?

4.   Are selected personality traits and cognitive abilities associated with an
       enhanced ability to learn from experience?

Chapter 3

Methodology

This chapter describes the study's sample and the data available about the sample. It also details the instruments used and the procedures involved in the study. The research design is described as a correlational design that examines the relationship between a measure of Learning Agility and ratings of performance on the job and potential for career advancement. Additionally, the relationship between Learning Agility and personality traits and intellectual ability is also explored through multiple regression analyses. It is important to note that the data used in this study were collected as part of the ongoing validation of an industrial-organizational psychology consulting firm's assessment process. As such, the data reflect authentic ratings of workplace behaviors and performance, as opposed to data collected by academic researchers in an artificial or analog setting.

Participants

The participants in this study fall into two categories. First are individuals who were assessed for job selection or development by an industrial and organizational psychology consulting firm. For the purpose of this study, members of this group are referred to as "participants". The 294 participants are divided into four groups based on their level of employment: individual contributors, who have no subordinates of their own; supervisors, who supervise individual contributors; middle managers, who supervise supervisors; and executives, broadly speaking, the people who supervise managers.

The second portion of the sample is comprised of the current direct supervisors of the participants described in the previous paragraph. These people were contacted to complete an evaluation of their subordinates' workplace behaviors and performance. For purposes of this study, members of this group are referred to as "managers". A total of 351 invitations to participate in the study were delivered to managers, and 294 completed evaluations of participants, resulting in a response rate of 83.76%. Some managers supervised more than one person who participated in the assessment process. For purposes of this study, no manager was asked to rate more than two participants. In total, 170 managers rated one participant, and 62 managers rated two participants.

A-priori sample size estimates were calculated based on the number of predictors to be analyzed by multiple regression. To obtain power of .8 with an alpha of .05 and an anticipated moderate effect size of .15 with 33 predictors (described below) it was determined that data for a minimum of 195 participants would be required to analyze the factors and traits that correlate with the Learning Agility Scale (Soper, 2010). A total sample of 294 was collected to allow the sample to be split into a training data set and a validating data set.

The participants were employed by 10 different companies representing 7 different industries. Details about the companies are included in Table 1. The sample included more men ($n = 219$) than women ($n = 74$). The majority of the sample was composed of supervisors ($n = 139$), followed by managers ($n = 87$), and executives ($n = 47$); individual contributors made up the smallest portion of the sample ($n = 25$). The participants were categorized into 11 job functions based on job titles and data collected at the time of assessment. The sample's most highly represented job functions were

sales (n = 139), finance (n = 31), and marketing (n = 26). The time elapsed between the

participants' assessment and the managers' evaluation ranged from 6 to 40 months

(mean = 24.9 months; SD = 7.6 months). A description of the participants included in

the study is detailed in Table 2.

Table 1

Summary of Company Characteristics (N = 10)

Characteristic	%	n
Ownership		
Publicly Traded	50.0	5
Privately Held	40.0	4
Not for Profit	10.0	1
Number of employees		
More than 10,000	30.0	3
5,000-9,999	10.0	1
2,500-4,999	20.0	2
1,000-2,499		0
500-999	30.0	3
Less than 500	10.0	1
Industry		
Consumer Goods	20.0	2
Finance	20.0	2
Medical Technology	20.0	2
Education	10.0	1
Industrial Goods	10.0	1
Professional Services	10.0	1
Transportation	10.0	1

Table 2

Summary of Participant Characteristics (N = 294)

Characteristic	%	n
Gender		
Female	25.5	75
Male	74.5	219
Highest Attained Level of Education		
High school	2.7	8
2-year degree	2.7	8
4-year degree	23.5	69
Graduate/Professional	28.2	83
Unknown	42.9	126
Level of Employment		
Individual Contributor	8.5	25
Supervisor	47.3	139
Manager	28.2	83
Executive	16.0	47
Time Since Assessment		
0-6 months	.0	1
7-12 months	5.4	16
13-18 months	16.7	49
19-24 months	22.8	67
25-30 months	26.9	79
31-36 months	26.6	78
36-42 months	1.4	4
Job Function		
Sales	47.3	139
Finance	10.6	31
Marketing	8.8	26
Human Resources	8.5	25
Operations	6.8	20
Manufacturing	5.8	17
Corporate	4.4	13
Research and Development	3.1	9
Information Technology	1.7	5
Supply Chain	1.7	5
Legal	1.4	4

Table 1, Continued

Summary of Participant Characteristics

Characteristic	%	*n*
Industry		
Industrial Goods	75.5	222
Finance	11.9	35
Medical Technology	4.1	12
Education	3.4	10
Professional Services	3.1	9
Consumer Goods	1.4	4
Transportation	0.7	2

Note: In some instances, total percentages may not add to 100 due to rounding.

Instruments

Demographic information. Data regarding the participants' gender, educational attainment, job level (individual contributor, supervisor, manager, or executive), as well as job function were collected for most participants at the time of assessment via the consultant firm's standard background form.

Job performance rating form (JPR). The Job Performance Rating form (JPR; MDA Leadership Consulting, 2009) was developed by the consulting firm to facilitate the ongoing validation of the assessment process. The instrument is a 72-item questionnaire that managers complete based on the performance of subordinates who were assessed by the consulting firm (see Appendix A). Using a seven-point Likert scale, managers rate subordinates in 16 job competency areas. Each job competency area is measured by at least 3 questions, and the questions vary slightly depending on the individual's job level (individual contributor, supervisor, manager, or executive). The JPR also includes global evaluations of current job performance and potential for advancement. An additional Learning Agility Scale (described below) was embedded within the JPR form. The instrument can be completed by a manager in approximately 10 to 15 minutes.

The JPR (including the embedded Learning Agility Scale) was piloted with a group of 14 business leadership and management consultants: 7 with advanced degrees in psychology (5 Ph.D.s, 1 Psy.D., 1 M.A.) and training in survey design and measurement, and 7 with expertise in business leadership and management consulting. As a result of the pilot, the order of the questions was revised, two items were reworded to improve clarity, and a handful of typographical errors were corrected.

Learning Agility Scale. As part of the JPR, managers answer 9 items used to assess Learning Agility. The items were developed from a careful review of the publications included in the present literature review. Passages that described Learning Agility or traits and behaviors related to Learning Agility were identified and later sorted into categories by the author and by psychologists at the consulting firm. Initially 15 categories were identified. The items in each category were tallied and the categories were ranked by prevalence. Some categories were combined, others were eliminated, and ultimately 9 items were developed. The final items were reviewed by subject matter experts for content and face validity and slight changes to wording were made. Sample items include: displays a desire to learn and gain new skills, accepts and acts on feedback from others, is open-minded and receptive to change and new ideas, reflects on and learns from mistakes (see Appendix B). Reliability of the scale was measured by calculating Cronbach's Alpha coefficients after the data were collected.

Workplace competency model. The JPR questions that are not part of the Learning Agility Scale focus on workplace behaviors as conceptualized by a workplace competency model (see Appendix C). The model describes 16 workplace competencies—skills and abilities deemed to play a significant role in career success— across six dimensions. The six dimensions include leading people, thinking and deciding, achieving, relating to people, managing work, and managing self (MDA Leadership Consulting, 2007). The 16 competencies embedded across the dimensions include leading courageously, creating alignment, team leadership, developing leaders, strategic thinking, business acumen, critical thinking and judgment, drive for results, risk taking and innovation, interpersonal effectiveness, building collaboration, planning

and organizing, managing execution, resilience, integrity, and learning agility (MDA, 2007). Each competency is represented in the JPR by a minimum of three questions. It should be noted that three JPR items for the MDA competency called "learning agility" are incorporated into the Learning Agility Scale.

The competency model was developed by the consulting firm based on research and best practices in the field of business management and leadership. The model was developed and refined by industrial and organizational psychologists and experts in business consulting. The model has not been validated. Data collected for the present study are also being used to validate the competency model in a parallel study.

Personality measures. At the time of the assessment, participants completed two different personality instruments: the California Psychological Inventory (CPI; Gough, 1996) and the Hogan Development Survey (HDS; Hogan & Hogan, 1997).

The CPI is a 434-item instrument intended to measure personality traits of normal adults across 20 scales. Gough's (1996) personality traits center around "folk concepts" that he contends are "constructs about personality that all people, everywhere, make use of to comprehend their own behavior and the behavior of others" (p. 2). The scales include Dominance, Capacity for Status, Sociability, Social Presence, Self-acceptance, Independence, Empathy, Responsibility, Socialization, Self-control, Good Impression, Communality, Well-being, Tolerance, Achievement via Conformance, Achievement via Independence, Intellectual Efficiency, Psychological-mindedness, Flexibility, and Femininity/Masculinity. Scores on the scales are standardized and t-scores are used to evaluate results. The mean of the t-scores is 50,

and the standard deviation is 10 points. Scores above 60 are typically interpreted as above average, and scores below 40 are generally considered below average.

Alpha coefficients for males ($N = 3,000$) range from a low of .43 for Femininity/Masculinity (F/M), generally conceived of as emotional sensitivity, to a high of .84 for Well-being (Wb). The median alpha coefficient among men is .76 (Gough, 1996). For females ($N = 3,000$), the alpha coefficients ranged from .43 on F/M to .85 on Wb, with a median of .76. The combined sample of males and females ($N = 6,000$) produced alpha coefficients ranging from .62 for Psychological-mindedness (Py) to .84 on Wb, with a median alpha of .77 (Gough, 1996). The test-retest correlation for a combined group of male and female high school students ($N = 237$) ranged from .51 for Communality (Cm) to .84 for F/M, with a median correlation of .68 with a one-year interval between the tests (Helson & Moane, 1987).

To reduce the number of predictors in the present study, the Communality (Cm) scale was omitted from all multiple regression analyses. The rationale behind this decision is based on the fact that the Cm scale is used primarily as a validity scale in the CPI. Additionally, only one participant in the sample has a score in what may be considered the invalid range; this participant's data were removed from the sample.

The HDS is a 168-item instrument designed to detect and measure 11 "common dysfunctional dispositions…caused by people's distorted beliefs about how others will treat them, and negatively influence people's careers and life satisfactions" (Hogan & Hogan, 1997, p. 1). The 11 scales are Excitable, Skeptical, Cautious, Reserved, Leisurely, Bold, Mischievous, Colorful, Imaginative, Diligent, and Dutiful. Hogan and Hogan (1997) draw some connections between their scales and Axis 2 personality

disorders from the DSM-IV-TR that may not rise to the level of clinical diagnosis but sometimes come to the surface when a person is either under stress or has let his or her guard down. Scores range from 0 to 100, with scores between 70 and 89 representing a "moderate risk" of the negative behavior manifesting in the test-taker and scores of 90 and above representing a "high risk". Low scores are typically not interpreted.

Alpha coefficients for an archival sample of adults ($N = 2,071$) ranged from .50 for Dutiful to .78 for Excitable, with a median alpha of .67. Test-retest reliability correlations over the course of one month with a sample of graduate students ($N = 60$) ranged from .58 for Leisurely to .87 for Excitable, with a median correlation of .75 (Hogan & Hogan, 1997).

Cognitive ability measures. At the time of the assessment, participants completed 3 intellectual ability tests: Employee Aptitude Survey 6 (EAS-6; Ruch et al., 1994), a measure of numerical reasoning; Employee Aptitude Survey 7 (EAS-7; Ruch et al., 1994), a measure of verbal reasoning, and the Watson-Glaser Critical Thinking Appraisal (Watson & Glaser, 2006), a measure of critical thinking ability.

The EAS-6 is a 20-item measure of numerical reasoning that gauges the test-taker's ability to "analyze logical relationships and discover underlying patterns" (Ruch et al., 1994, p. 7). The examinee is required to select the next number in a sequence of numbers from 5 available options. The EAS-6 is often thought of as a measure of inductive reasoning. The examinee has 5 minutes to complete the exercise. Scores on the EAS-6 range from 0 to 20. Examinees get a point for each correct answer and a quarter point is deducted for each incorrect answer. Unanswered questions do not count toward the raw score. The EAS-6's reliability has been established at .81 by alternate-

form methods of reliability estimation (Ruch et al., 1994). It is highly correlated with

Thurstone's (1947) Primary Mental Abilities-Reasoning test (PMA-Reasoning; r = .68)

(Ruch et al., 1994).

The EAS-7 is a 30-item verbal reasoning assessment that provides examinees

with a series of facts followed by five conclusions. The test-taker must determine, based

on the fact pattern, whether each conclusion is true, false, or uncertain (i.e., there is not

sufficient information to make a judgment). The EAS-7 is typically considered a

measure of deductive reasoning. The examinee has 5 minutes to complete the test.

Scores on the EAS-7 range from 0 to 30. Examinees earn one point for each correct

answer and one-third of a point is deducted for each incorrect answer; unanswered

questions do not contribute to the raw score. Alternate form reliability estimation places

the reliability of the EAS-7 at .82 (Ruch et al., 1994). Scores on the EAS-7 are highly

correlated with the PMA-Verbal and PMA-Reasoning test scores (Thurstone &

Thurstone, 1947).

The Watson-Glaser Critical Thinking Appraisal (WGCTA; Watson & Glaser,

2008) is an 80-item test that assesses 5 aspects of critical thinking: inference,

recognition of assumptions, deduction, interpretation, and evaluation of arguments.

Examinees are presented with short scenarios and asked several questions about each

scenario. The test is administered electronically and test-takers have as much time as

they need to complete the assessment. Raw scores range from 0 to 80 and reflect the

number of questions answered correctly. Data from a variety of normative groups are

available from the test publisher to aid in the interpretation of raw scores. Split-half

reliability coefficients across a variety of workplace samples range from .69 to .85, with

test-retest reliability of .73 following a 3-month interval (Watson & Glaser, 2008). Criterion-related validity measures that ask managers to rate problem-solving and judgment/decision-making ability indicate strong correlations between WGCTA scores and managerial ratings (Kudisch & Hoffman, 2002; Watson & Glaser, 2006). Convergent validity studies show strong correlations between the verbal section of the Wechsler Adult Intelligence Scale (WAIS; Wechsler, 1955), the Miller Analogies Test (MAT; Psychological Corporation, 1994), and the American College Testing program (ACT; American College Testing, 1997), among others.

Procedures

Data used in this study were collected between December 2009 and September 2010 as part of a larger, ongoing effort of the consulting firm to collect data for the validation of its assessment process. The managers of individuals who had been assessed by the consulting firm were invited to complete a JPR after their subordinate had been on the job for at least 6 months. Consultants at the industrial and organizational psychology consulting firm initiated the study by introducing the project to their clients in writing or by phone. Client organizations that expressed a willingness to participate in the study were provided a list of assessments completed by the consulting firm between January 1, 2007 and December 31, 2009 and asked to identify which individuals were currently employed by the company, who their direct supervisor was, and that person's email address. After contact information had been updated, client organizations sent internal communication to managers describing the project and encouraging their participation in the study. Once companies had sent internal communication, managers were sent an email from the consulting firm further

describing the study and providing them with a web link to an online version of the JPR. If managers did not complete the survey, a reminder was sent one week later, and a second and final reminder was sent the subsequent week. As managers completed surveys, the JPR ratings were linked in the consulting firm's database with the participant's previously collected personality and cognitive ability data.

Missing Data Adjustments

In some instances, managers did not answer all of the JPR items. Six different managers each failed to respond to 1 item in the Learning Agility Scale, which is equal to 0.23% of all the managers rating data points on the Learning Agility Scale. There did not appear to be any pattern to the items that were omitted by managers. Because of the small number of omitted items, the missing responses were replaced with the group mean for that item. In other instances, the participants' personality and cognitive ability data were incomplete. For example, in 6 instances at the time of assessment participants did not complete the CPI in lieu of different personality assessment; these 6 cases were removed from the study. Some participants did not complete the EAS-6 ($n = 6$) or the EAS-7 ($n = 7$). In these cases, the missing scores were replaced with the group mean.

Hypotheses

The following hypotheses were generated and tested in this study:

1. Learning Agility does not vary significantly by group membership of the participant.
2. Learning Agility is significantly and positively correlated with current job performance.

3. Learning Agility is significantly and positively correlated with potential for career advancement.

4. Learning Agility predicts job performance above and beyond other factors.

5. Learning Agility predicts potential for career advancement above and beyond other factors.

6. Selected cognitive ability and personality traits predict Learning Agility.

Therefore the following null hypotheses were developed:

Ho_1: Learning Agility scores will not differ by group membership of the participant.

Ho_2: Learning Agility scores will not be correlated to ratings of job performance.

Ho_3: Learning Agility scores will not be correlated to ratings of potential for advancement.

Ho_4: Learning Agility scores will not account for unique variance in ratings of job performance.

Ho_5: Learning Agility scores will not account for unique variance in ratings of potential for advancement.

Ho_6: Cognitive ability and personality traits will not be related to Learning Ability scores.

Data Analysis

The following analysis procedures were employed in this study.

1. The data were prepared for analysis by examining the JPR ratings and calculating Learning Agility scores for each participant. Means and standard

deviations were calculated for each item on the Learning Agility Scale, and a Learning Agility Score was calculated for each participant by averaging all 9 items.

2. Alpha coefficients were calculated for the Learning Agility Scale to determine the degree of internal consistency among the items.

3. Next, Analysis of Variance was used to determine if there were any significant differences in Learning Agility scores by levels (individual contributor, supervisor, manager, and executive), gender, educational attainment, or job function. A 1-way ANOVA was conducted for each variable.

4. Finding no significant differences, the following correlations were calculated:

   Learning Agility scores and manager ratings of job performance.

   Learning Agility scores and manager ratings of career potential.

5. Finding a statistically significant relationship between Learning Agility scores and ratings of performance and potential, multiple regressions were conducted to determine whether Learning Agility scores accounted for a significant portion of the variance in manager ratings of performance and ratings of potential when controlling for gender, months since assessment, familiarity with the participant, and educational attainment.

6. With Learning Agility scores responsible for a significant portion of the variance in potential, 200 cases were randomly drawn from the sample for an initial or training analysis, and the remaining 94 cases were reserved to

cross-validate any significant initial findings. The training analysis used multiple regression techniques to identify any cognitive abilities or personality traits that were statistically significant predictors of Learning Agility scores. A full-model analysis was completed using all 3 measures of cognitive ability, all 11 scales of the HDS, and 19 of the 20 CPI scales.

7. A reduced-model analysis was completed using scales that were identified as statistically significant in the full-model analysis. Final cross-validation of these findings was not necessary as no significant results came from the reduced-model.

8. To further explore the relationship between Learning Agility and workplace behaviors, composite scores for each workplace competency in the JPR were calculated and regressed against the Learning Agility score to see which competencies accounted for the greatest variance in the Learning Agility scores.

Chapter 4

Results

The present study examined the relationships between Learning Agility and job

performance and potential for career advancement. It also attempted to dissect the

Learning Agility construct to determine which cognitive abilities and personality traits

assist people in learning from experience. To that end, this study sought to answer the

following questions:

1. Is Learning Agility correlated with current job performance?

2. Is Learning Agility correlated with potential for future career
   advancement?

3. Does Learning Agility explain variance in ratings of current performance
   and future potential that are not explained by other predictors (e.g.,
   workplace behaviors, personality, cognitive ability data)?

4. What personality traits and cognitive abilities are associated with an
   enhanced ability to learn from experience?

This chapter presents the results of the statistical analyses used to examine these

questions. First, descriptive statistics for the nine items in the Learning Agility Scale are

detailed, along with a correlation matrix for the items. Next, the alpha coefficient is

presented to demonstrate the internal consistency of the scale. Analysis of Variance

(ANOVA) results are presented to determine whether Learning Agility scores vary by

levels of employment, job function, educational attainment, or gender. Then,

correlations between Learning Agility scores and job performance and potential for

advancement are presented. Next, the results of two stepwise multiple regression

analyses that examine the amount of variance in job performance ratings and ratings of potential for advancement accounted for by Learning Agility scores are described. Then, the results of a full- and reduced-model multiple regression assessing the cognitive abilities and personality traits that are predictive of Learning Agility scores are presented. Finally, the results of a multiple regression that examines the workplace competencies that influence Learning Agility scores are presented. Descriptive statistics and a correlation matrix for all the variables included in this study are contained in Appendix D.

Learning Agility Scale Items

The Learning Agility Scale was constructed using nine items embedded in the JPR. The mean scores were clustered relatively tightly from 4.78 to 5.33 with standard deviations ranging from 1.04 to 1.17. The individual items, means, and standard deviations are presented in Table 3.

Table 3

Means and Standard Deviations for Learning Agility Items

Item	M	SD	N
1. Accepts and acts on feedback from others.	5.06	1.15	294
2. Is flexible; adjusts his/her approach when something doesn't work.	4.83	1.17	294
3. Is curious and inquisitive.	5.26	1.16	294
4. Is self-aware; knows own strengths and limitations.	4.78	1.15	294
5. Displays a desire to gain new knowledge and skills.	5.33	1.08	294
6. Actively pursues personal growth and improvement.	5.08	1.13	294
7. Seeks out challenges and new experiences.	5.06	1.11	294
8. Is open-minded and receptive to change and new ideas.	5.01	1.04	294
9. Reflects on and learns from mistakes.	4.92	1.13	294

Note: Ratings can range from 1 to 7, which higher scores indicating stronger agreement with the item.

Responses to the nine items from the Learning Agility Scale were correlated. The mean inter-item correlation is $r = .60$. The weakest correlation was between Item 2 (Is flexible; adjusts his/her approach when something doesn't work) and Item 6 (Actively pursues personal growth and improvement) ($r = .36$). The strongest correlations were between Item 5 (Displays a desire to gain new knowledge and skills) and Item 6 (Actively pursues personal growth and improvement), and between Item 8 (Is open-mined and receptive to change and new ideas) and Item 9 (Reflects on and learns from mistakes). Both pairs were highly correlated ($r = .77$). A correlation matrix for all nine items is depicted in Table 4.

Table 4
Learning Agility Scale Inter-Item Correlation Matrix ($N = 294$)

Items	1	2	3	4	5	6	7	8	9
1. Accepts and acts on feedback from others.	1.00								
2. Is flexible; adjusts his/her approach when something doesn't work.	.59	1.00							
3. Is curious and inquisitive.	.52	.44	1.00						
4. Is self-aware; knows own strengths and limitations.	.62	.53	.51	1.00					
5. Displays a desire to gain new knowledge and skills.	.49	.38	.70	.55	1.00				
6. Actively pursues personal growth and improvement.	.50	.36	.67	.54	.77	1.00			
7. Seeks out challenges and new experiences.	.59	.41	.74	.57	.72	.75	1.00		
8. Is open-minded and receptive to change and new ideas.	.62	.63	.62	.62	.62	.58	.67	1.00	
9. Reflects on and learns from mistakes.	.71	.58	.58	.71	.59	.59	.66	.77	1.00

Cronbach's alpha (1951) was calculated as a measure of internal consistency to gauge the reliability of the scale. When all nine items were considered together, alpha = .929. Only one of the nine items could be removed to improve the internal consistency of the scale. When Item 2 (Is flexible; adjusts his/her approach when something doesn't work) is removed from the scale, alpha = .930. Considering how small the improvement was and the frequency with which flexibility was referenced in the literature, the item was not removed from the scale.

Group Differences by Level

Analyses of Variance (ANOVAs) were used to determine whether Learning Agility scores systematically differed by gender, job level (individual contributor, supervisor, manager, executive), job function, or highest level of attained education. These analysis were conducted to determine whether the sample could be analyzed together or whether group differences would require the sample to be divided for further analysis. None of the four analyses produced significant results: gender $F(1, 292) = .021$, $p = .886$, job level $F(3, 290) = .194$, $p = .900$, job function $F(10, 283) = .219$, $p = .219$, and educational attainment $F(3, 164) = .173$, $p = .914$. These results suggest that Learning Agility scores do not vary significantly across any of these different groups. The findings lend credence to Kaiser and Craig's (2005) contention that Learning Agility is an important skill at every level of leadership.

Correlations between Learning Agility and Job Performance and Potential

Finding that the Learning Agility Scale provided internally consistent ratings, and uncovering no systematic group differences in the scores, correlations between

Learning Agility and manager ratings of current job performance and of future potential

for career advancement were calculated.

Learning Agility Scores were significantly correlated with both ratings of

current performance ($r = .78$, $p < .01$) and predictions of future potential ($r = .77$, $p <$

.01). This is consistent with the literature that suggests that Learning Agility is highly

predictive of both job performance and potential for advancement (Connelly, 2001;

Eichinger & Lombardo, 2000). Table 5 shows the correlations between Learning

Agility and performance and potential. It is perhaps not surprising that current

performance is also highly correlated with potential ($r = .823$, $p < .01$).

Table 5

Learning Agility Scale, Performance, and Potential Correlation Matrix ($N = 294$)

		LA Score	Performance	Potential
LA Score	Pearson Correlation	1.0	.778**	.767**
Performance	Pearson Correlation		1.0	.823**
Potential	Pearson Correlation			1.0

Note. ** Correlation is significant at the 0.01 level (2-tailed).

Variance in Performance Scores Attributed to Learning Agility

A multiple regression analysis was conducted to determine whether managers'

assessments of Learning Agility accounted for a significant portion of the variance in

ratings of performance when controlling for other factors that are likely to influence

ratings of performance. To perform this analysis, a stepwise regression was conducted.

The first step regressed manager ratings of 15 job competency areas from the JPR,

gender, the number of months between assessment and JPR evaluation, manager's

familiarity with the participant, and the participant's highest attained educational level. The second step added the Learning Agility scores. This analysis was expected to indicate the relative value managers place on Learning Agility when making judgments about job performance.

The first model, which looked at job performance without the influence of Learning Agility, proved to be statistically significant F (19, 148) = 24.208, $p < .001$. This model accounted for 75.7% of variance in ratings of performance. Three competencies contributed significantly to the first model: team leadership, $\beta = .198$, $p = .010$; leading courageously, $\beta = .117$, $p = .021$; and critical thinking, $\beta = .200$, $p = .040$.

Learning Agility scores were added to the second step, and this model was also significant F (20, 147) = 23.451, $p < .001$. With the addition of Learning Agility scores to the model, it accounted for 76.1% of the variance. Manager ratings of leading courageously ($\beta = .179$, $p = .020$) and team leadership ($\beta = .173$, $p = .027$) continued to make a significant contribution to the model, but Learning Agility did not make a statistically significant contribution to the model, $\beta = .178$, $p = .087$. Consequently, the change in R-square between model 1 and model 2 is not significant, $\Delta R^2 = .005$, $p = .087$. This analysis suggests that although Learning Agility is highly correlated with ratings of performance, a significant unique portion of the variance in ratings of performance cannot be attributed to Learning Agility. In other words, the variance accounted for by Learning Agility is shared with other factors. This conclusion is consistent with the findings of Spreitzer et al. (1997) that Learning Agility does not predict ratings of current performance. The coefficients of predictors included in each model are detailed in Table 6; significant findings are highlighted in bold typeface.

Table 6

Coefficients for Job Performance Predictors

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	SE	β	t	Sig.
1 (Constant)	-1.561	.782		-1.996	.048
Interpersonal effectiveness	.046	.079	.035	.580	.563
Building collaboration	-.022	.026	-.043	-.840	.402
Leading courageously	**.230**	**.099**	**.177**	**2.324**	**.021**
Creating alignment	.048	.114	.037	.418	.677
Team leadership	**.261**	**.101**	**.198**	**2.596**	**.010**
Developing leaders	-.059	.060	-.065	-.994	.322
Strategic thinking	.154	.126	.111	1.219	.225
Business acumen	-.120	.107	-.087	-1.124	.263
Critical thinking	**.200**	**.096**	**.173**	**2.076**	**.040**
Planning and organizing	.159	.137	.108	1.164	.246
Managing execution	.110	.094	.092	1.180	.240
Drive for results	.160	.089	.136	1.805	.073
Risk taking & innovation	.069	.105	.053	.660	.511
Resilience	.067	.100	.049	.678	.499
Integrity	-.034	.104	-.026	-.322	.748
Familiarity with Participant	.303	.170	.084	1.780	.077
Gender	-.136	.127	-.047	-1.075	.284
Attained education	-.109	.076	-.063	-1.438	.153
Months since assmnt	-.002	.008	-.012	-.273	.785

2		B	Std. Error		Beta	t	Sig.
	(Constant)	-1.537	.777			-1.977	.050
	Interpersonal effectiveness	.020	.080		.015	.246	.806
	Building collaboration	-.022	.026		-.044	-.853	.395
	Leading courageously	**.231**	**.098**		**.179**	**2.356**	**.020**
	Creating alignment	.050	.113		.039	.445	.657
	Team leadership	**.228**	**.102**		**.173**	**2.238**	**.027**
	Developing leaders	-.059	.059		-.064	-.988	.325
	Strategic thinking	.179	.126		.129	1.417	.159
	Business acumen	-.124	.106		-.090	-1.170	.244
	Critical thinking	.151	.100		.131	1.512	.133
	Planning and organizing	.164	.136		.111	1.204	.230
	Managing execution	.098	.093		.082	1.048	.296
	Drive for results	.110	.093		.093	1.182	.239
	Risk taking & innovation	.031	.106		.024	.291	.772
	Resilience	.026	.102		.019	.256	.798
	Integrity	-.061	.105		-.046	-.580	.563
	Familiarity with Participant	.300	.169		.083	1.774	.078
	Gender	-.157	.126		-.053	-1.239	.217
	Attained education	-.121	.076		-.070	-1.601	.111
	Months since assmnt	-.001	.007		-.008	-.192	.848
	Learning Agility	.258	.150		.178	1.722	.087

Note. Dependent Variable: Compared to others you have known in similar roles, how would you rate this individual's job performance?
$R^2 = .757$, $p < .001$ for step 1; $\Delta R^2 = .005$, $p = .087$ for step 2.

Variance in Potential Scores Attributed to Learning Agility

A second multiple regression analysis was conducted to determine whether managers' assessments of Learning Agility accounted for a significant portion of the variance in predicted potential for career advancement when controlling for other factors that are likely to influence ratings of potential. The same stepwise multiple regression previously described was conducted against managers' ratings of potential for career advancement. The results of the analysis are presented in Table 7.

The results were similar to the stepwise regression conducted on performance. The first model was statistically significant, F (19, 148) = 20.833, $p <$ 0.001, accounting for 72.8% of variance in ratings of potential. Ratings of three competencies made significant contributions to the model: leading courageously, β = .323, $p <$ .001; critical thinking, β = .307, p = .001; and team leadership, β = .169, p = .038. Additionally, gender made a significant negative contribution to the model (note: gender was coded with females = 1, and males = 0), β = -.108, p = .020.

The second step added Learning Agility scores and created another statistically significant model, F (20, 147) = 20.679, $p <$ .001. In this instance, the model could account for 73.8% of the variance in potential. Several factors made significant contributions to this model: gender, β = -.118, p = .010; critical thinking, β = .247, p = .007; leading courageously, β = .324, $p <$ .001; and Learning Agility, β = .256, p = .020. The significant increase in variance accounted for with the second model (ΔR^2 = .010, p = .020) suggests that Learning Agility makes a significant and unique contribution to the variance in ratings of potential for career advancement. It is also noteworthy that when added to the model, Learning Agility has the second highest beta

weight in the standardized regression equation. The coefficients of potential predictors

for each model are detailed in Table 7.

Table 7

Coefficients for Job Potential Predictors

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	SE	β	t	Sig.
1 (Constant)	-1.632	.870		-1.876	.063
Interpersonal effectiveness	.072	.087	.053	.823	.412
Building collaboration	-.011	.029	-.021	-.386	.700
Leading courageously	**.439**	**.110**	**.323**	**3.998**	**.000**
Creating alignment	.050	.127	.037	.390	.697
Team leadership	**.234**	**.112**	**.169**	**2.096**	**.038**
Developing leaders	.052	.066	.054	.787	.432
Strategic thinking	.081	.140	.056	.580	.563
Business acumen	.004	.119	.003	.031	.975
Critical thinking	**.374**	**.107**	**.307**	**3.491**	**.001**
Planning and organizing	-.062	.152	-.040	-.407	.685
Managing execution	.025	.104	.020	.238	.812
Drive for results	.073	.099	.059	.744	.458
Risk taking & innovation	.050	.117	.036	.429	.668
Resilience	-.049	.111	-.034	-.445	.657
Integrity	-.056	.116	-.041	-.486	.628
Familiarity with Participant	.035	.189	.009	.183	.855
Gender	**-.332**	**.141**	**-.108**	**-2.354**	**.020**
Attained education	.064	.084	.035	.757	.450
Months since assmnt	-.005	.008	-.025	-.547	.585

2	(Constant)	-1.595	.857			-1.861	.065
	Interpersonal effectiveness	.033	.088		.024	.372	.710
	Building collaboration	-.011	.028		-.022	-.402	.688
	Leading courageously	**.442**	**.108**		**.324**	**4.081**	**.000**
	Creating alignment	.054	.125		.040	.430	.668
	Team leadership	.184	.112		.133	1.641	.103
	Developing leaders	.053	.065		.055	.816	.416
	Strategic thinking	.119	.139		.082	.855	.394
	Business acumen	-.003	.117		-.002	-.022	.982
	Critical thinking	**.300**	**.110**		**.247**	**2.726**	**.007**
	Planning and organizing	-.055	.150		-.036	-.368	.713
	Managing execution	.006	.103		.004	.055	.956
	Drive for results	-.003	.102		-.002	-.027	.979
	Risk taking & innovation	-.008	.117		-.005	-.065	.948
	Resilience	-.112	.112		-.077	-.996	.321
	Integrity	-.097	.115		-.070	-.843	.401
	Familiarity with Participant	.030	.186		.008	.162	.872
	Gender	**-.362**	**.139**		**-.118**	**-2.600**	**.010**
	Attained education	.045	.083		.025	.546	.586
	Months since assmnt	-.004	.008		-.020	-.443	.659
	Learning Agility	**.389**	**.165**		**.256**	**2.357**	**.020**

Note. Dependent Variable: Compared to others you have known in similar roles, how would you rate this individual's overall ability to succeed in a more senior or more critical leadership position in the future?

$R^2 = .728$, $p < .001$ for step 1; $\Delta R^2 = .010$, $p = .020$ for step 2.

Learning Agility Predictors Full Model

Finding that a significant and unique portion of the variance in potential ratings can be attributed to Learning Agility, a multiple regression was conducted to determine which cognitive ability and personality traits best predict Learning Agility. Three cognitive abilities and 30 personality traits were regressed against Learning Agility scores in the full-model regression.

The full model was not predictive, $F(33, 161) = 1.115$, $p = .320$. However, three scales from CPI produced significant results: Good Impression (Gi), $\beta = -.301$, $p = .044$; Well-being (Wb), $\beta = .280$, $p = .021$; and Achievement by Independence (Ai), $\beta = .244$, $p = .037$. A detailed display of all coefficients is shown in Table 8.

Table 8

Learning Agility Predictor Coefficients: Full Model

Full Model	Unstandardized Coefficients		Standardized Coefficients		
	B	SE	Beta	t	Sig.
1 (Constant)	2.595	2.561		1.013	.313
EAS-6	.014	.026	.051	.526	.600
EAS-7	.031	.016	.192	1.941	.054
WGCTA	-.003	.011	-.031	-.281	.779
Excitable	-3.544E-6	.004	.000	-.001	.999
Skeptical	.001	.004	.035	.341	.733
Cautious	-.003	.004	-.079	-.752	.453
Reserved	-.003	.003	-.084	-.863	.389
Leisurely	-.003	.003	-.099	-1.121	.264
Bold	.006	.003	.170	1.655	.100
Mischievous	.001	.003	.042	.420	.675
Colorful	-.003	.004	-.081	-.779	.437
Imaginative	.001	.003	.021	.226	.821
Diligent	.003	.003	.078	.896	.372
Dutiful	.002	.003	.071	.826	.410
Do	.022	.015	.164	1.430	.155
Cs	-.016	.019	-.099	-.863	.389
Sy	-.030	.019	-.203	-1.577	.117
Sp	.017	.016	.124	1.070	.286
Sa	-.015	.018	-.087	-.824	.411
In	.007	.019	.039	.365	.715
Em	-.016	.013	-.128	-1.215	.226
Re	-.004	.017	-.027	-.232	.817
So	-.017	.016	-.099	-1.110	.269
Sc	.014	.022	.103	.650	.517
Gi	**-.033**	**.016**	**-.301**	**-2.030**	**.044**
Wb	**.066**	**.028**	**.280**	**2.329**	**.021**
To	-.024	.019	-.145	-1.260	.210
Ac	.025	.020	.140	1.272	.205
Ai	**.039**	**.019**	**.244**	**2.100**	**.037**
Ie	-.024	.020	-.135	-1.193	.235
Py	.000	.015	-.002	-.020	.984
Fx	.012	.011	.125	1.115	.267
FM	.009	.011	.077	.808	.420

Note. Dependent Variable: LA Score. Do = Dominance; Cs = Capacity for Status; Sy = Sociability; Sp = Social Presence; Sa = Self-Acceptance; In = Independence; Em = Empathy; Re = Responsibility; So = Socialization; Sc = Self-Control; Gi = Good Impression; Wb = Well-being; To = Tolerance; Ac = Achievement via Conformance; Ai = Achievement via Indpendence; Ie = Intellectual Efficiency; Py = Psychological-Mindedness; Fx = Flexbility; FM = Femininity/Masculinity.

Learning Agility Predictors Reduced Model

Based on the results of the previous analysis, a reduced model was tested by regressing Good Impression, Well-being, and Achievement by Independence against Learning Agility. The reduced model was not predictive, $F(3, 192) = 2.024$, $p = .112$. In the reduced model, none of the three factors accounted for a significant portion of the variance in Learning Agility scores. The coefficients are depicted in Table 9.

Table 9

Learning Agility Predictor Coefficients: Reduced Model

Reduced Model	Unstandardized Coefficients		Standardized Coefficients		
	B	SE	Beta	t	Sig.
1 (Constant)	3.089	1.134		2.723	.007
Gi	-.017	.010	-.154	-1.718	.087
Wb	.034	.022	.142	1.555	.122
Ai	.016	.012	.105	1.430	.154

Note. Dependent Variable: LA Score. Gi = Good Impression; Wb = Well-being; Ai = Achievement via Independence.

Validation Sample

As noted previously, 94 cases were reserved to cross-validate any significant correlations between Learning Agility and personality traits and/or cognitive abilities. Given that these analyses produced no significant results, there was no need employ the validation sample, as there were no findings to validate.

Learning Agility Predicted by Workplace Competencies

In an effort to further understand the Learning Agility construct, composite scores from managers' JPR ratings were calculated for 15 of the 16 competencies in the MDA Competency Model (MDA Leadership Consulting, 2007); the learning agility competency was omitted from the analysis because the three JPR items for that

competency overlap with the nine Learning Agility Scale items. A multiple regression was conducted that regressed the 15 competencies against the Learning Agility score in order to determine whether there are categories of workplace behaviors that predict Learning Agility.

The competency composite scores were able to predict Learning Agility scores with considerable accuracy, F (15, 278) = 100.249, $p < .001$. The model accounted for 84.4% of the variance in Learning Agility scores. Seven of the 15 competencies made significant contributions to the model: Driving Results, $\beta = .223$, $p < .001$; Resilience, $\beta = .187$, $p < .001$; Critical Thinking, $\beta = .181$, $p < .001$; Risk-taking and Innovation, $\beta = .177$, $p < .001$; Integrity, $\beta = .160$, $p < .001$; Interpersonal Effectiveness, $\beta = .135$, $p < .001$; Creating Alignment, $\beta = .091$, $p < .05$. These findings suggest that certain workplace competencies and behaviors as measured by the JPR can predict Learning Agility. An examination of the skills and abilities that contribute to each significant competency may give some insight into what workplace behaviors correlate with Learning Agility. The coefficients for all of the competencies in the model are displayed in Table 10.

Table 10

Competency Coefficients for Learning Agility

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	SE	Beta	t	Sig.
(Constant)	.209	.140		1.497	.135
Interpersonal effectiveness	**.124**	**.032**	**.135**	**3.904**	**.000**
Building collaboration	.000	.011	.001	.031	.975
Leading courageously	-.006	.038	-.006	-.146	.884
Creating alignment	**.076**	**.038**	**.091**	**1.999**	**.047**
Team leadership	.032	.028	.041	1.120	.264
Developing leaders	-.011	.018	-.020	-.609	.543
Strategic thinking	-.078	.046	-.084	-1.676	.095
Business acumen	.005	.038	.005	.119	.906
Critical thinking	**.146**	**.038**	**.181**	**3.835**	**.000**
Planning & organizing	.058	.044	.061	1.299	.195
Managing execution	-.040	.023	-.060	-1.700	.090
Driving results	**.172**	**.033**	**.223**	**5.280**	**.000**
Risk-taking and innovation	**.160**	**.043**	**.177**	**3.743**	**.000**
Resilience	**.168**	**.037**	**.187**	**4.506**	**.000**
Integrity	**.141**	**.038**	**.160**	**3.683**	**.000**

Note. Dependent Variable: LA Score

Summary

The present study was an examination of the Learning Agility construct. To that end, a measure of Learning Agility was developed and administered to the managers of 294 participants who were previously assessed by an industrial and organizational psychology consulting firm. The Learning Agility Scale was examined and found to have good internal consistency reliability. Analyses of variance indicated that Learning Agility scores did not vary by gender, job level, job function, or educational attainment. However, Learning Agility scores were highly correlated with both ratings of current job performance and potential for career advancement. Further analysis showed that Learning Agility accounted for a significant and unique portion of the variance in ratings of potential but not ratings of current performance. Analyses that sought to identify cognitive abilities and personality traits that predicted Learning Agility uncovered no significant findings, but a number of broader workplace competencies rated by managers (e.g., interpersonal effectiveness, creating alignment, critical thinking) were found to account for nearly 85% of the variance in Learning Agility scores.

Chapter 5

Discussion

This chapter summarizes the findings of the present study and considers the implications and applications of the results. Each of the research questions is reviewed in light of the findings, and the relationship with extant literature is discussed. Limitations of the study and recommendations for future research are described at the end of the chapter.

This study was an examination of the Learning Agility construct, which is defined by Eichinger and Lombardo (2000) as the ability to "learn new competencies in order to perform under first-time, tough, or different conditions" (p. 323). The literature is mixed on the implications of strong Learning Agility. Some researchers suggest that Learning Agility is correlated with job performance and potential for advancement (Connolly, 2001; Eichinger & Lombardo, 2000), while others suggest that it is only associated with potential and not performance (Dries et al., 2010; Spreitzer et al., 1997). Kaiser and Craig (2005) do not comment on the predictive power of Learning Agility, but they do argue that it is a necessary ability to make the sorts of workplace transitions that are encountered with job promotions.

The research is also mixed when it comes to describing the traits that make someone learning agile. Eichinger and Lombardo (2000) contend that Learning Agility is a construct distinct from cognitive ability and personality, but in a validation of their construct, Connolly (2001) found that two of the factors in Eichinger and Lombardo's (2000) model were correlated with openness to experience. That result is consistent with the Spreitzer et al. (1997) finding that openness is related to the ability to learn.

Spreitzer et al. (1997) do not address cognitive ability, but Connolly's (2001) findings corroborate Eichinger and Lombardo's (2000) assertion that there is no correlation between Learning Agility and general mental ability. At the same time there is a body of literature related to tacit and practical knowledge (Sternberg et al., 1995; Wagner & Sternberg, 1990) that seems to overlap significantly with Learning Agility in the way the constructs are described and the correlations they share with Learning Agility. Nonetheless, none of the concepts are described in sufficient detail to conclude definitively that Learning Agility and tacit and practical knowledge are the same phenomena.

If the Learning Agility construct were a painting, it would be from the impressionist school. From a distance it seems to have some form and definition, but as you look more closely, it becomes increasingly difficult to make out the details. This study sought to sharpen the brush strokes and provide some evidence to better understand the role of Learning Agility in job performance and career advancement. To that end, the study attempted to identify personality characteristics or cognitive abilities that would assist in early identification of learning-agile persons. This study examined the following hypotheses:

1. Learning Agility does not vary by group membership.

2. Learning Agility is correlated with current job performance.

3. Learning Agility is correlated with potential for career advancement.

4. Learning Agility predicts job performance above and beyond other factors.

5. Learning Agility predicts potential for career advancement above and beyond other factors.

6. Cognitive ability and personality traits predict Learning Agility.

Hypothesis 1: Learning Agility Does Not Vary by Group.

The one-way ANOVA that examined Learning Agility across four leadership levels (individual contributor, supervisor, manager, and executive) found no significant difference by group. From a practical standpoint, this result is important because it allowed the entire sample to be analyzed as one group, rather than by job level.

In light of existing scholarship, this finding is consistent with Kaiser and Craig's (2005) research which suggests the ability to learn from experience is one critical workplace competency regardless of leadership level. One would expect to see it present at each level. This result also may support Williams' (1991) finding that experience (i.e., time on the job or time in the workplace) alone does not explain one's ability to learn from experience. If experience fueled Learning Agility, one would expect to see higher levels of Learning Agility in executives, who are generally more experienced than individual contributors or front-line managers, but that does not appear to be the case in the present study.

Along the same lines, Eichinger and Lombardo (2000) would probably not be surprised to know that Learning Agility did not vary based on level of attained education. This result seems to be consistent with Connolly's (2001) argument that Learning Agility has more to do with adaptability than with mental ability. It appears more and more that Learning Agility is not necessarily about how much one knows but rather how one "picks up" information, distills what is important, and applies what one knows. In this way, Learning Agility sounds more and more like practical intelligence and tacit knowledge (Sternberg et al., 1995).

The other analyses related to this hypothesis were not intended to validate or refute previous research findings as much as they were intended to create a clearer picture of Learning Agility. In many ways it is reassuring that Learning Agility does not vary systematically by gender. Men and women have equal opportunities to learn from experience. On an intuitive level, this makes sense. We all know men and women who are successful in the workplace and operate effectively in uncertain or ambiguous situations. It is not an ability that we would naturally associate with one gender or the other.

The last analysis in this area examined job function. The results suggested that Learning Agility did not vary by job function, but it was interesting to see 10 of the 11 functions clustered together with similar means, while the legal function produced a much lower mean (although as noted, not low enough to be statistically significant). Not to belabor nonsignificant results, but it is interesting to consider why legal professionals would produce Learning Agility scores that look different from the others. On one hand, legal professionals are taught to think expansively and creatively to solve problems, particularly when analogizing or distinguishing a particular set of facts to previous judicial decisions or when working with a client and another party to structure a mutually beneficial transaction. This would probably require Learning Agility. On the other hand, a great deal of legal work involves applying standards and following procedures set out in legislation and legal codes, which may not require a great amount of Learning Agility. It could be interesting to examine the Learning Agility of legal professionals and see whether there are any differences in scores based on practice area expertise.

Even though differences by groups were not detected, ideally future research with larger samples would allow for analyses by group membership. It is possible that the personality and cognitive ability characteristics that are predictive of Learning Agility at one level of work or in one particular job function were diluted when the analysis was conducted across groups. Significant results may be found when analyzing data at the group level.

Hypotheses 2 and 3: Correlations with Performance and Potential

The present study found significant correlations between Learning Agility scores and manager ratings of current performance ($r = .78$, $p < .01$) and potential for advancement ($r = .77$, $p < .01$). Although it is reported below under Limitations of this Research, it should be noted here as well that these correlations may be inflated by virtue of using a single source of data (manager ratings). Nonetheless, they are strong, positive correlations and should be representative of some relationship, even if that relationship is over-estimated due to the single data source.

Based on the literature, these strong correlations are not particularly surprising. Nearly all the sources cited in the literature review suggest a correlation between Learning Agility and potential for career advancement (Connolly, 2001; Dries, et al., 2010; Eichinger & Lombardo, 2000; Spreitzer et al., 1997). Likewise, most of the researchers also found a relationship between Learning Agility and performance (Connolly, 2001; Eichinger & Lombardo, 2000; Wagner & Sternberg, 1990; Williams, 1991).

Considering the writing of thought leaders such as McCauley (2001), London and Maurer (2004), and Van Velsor et al. (2004), it is not surprising that individuals

whom managers describe as learning agile are also performing well on the job and have potential for career advancement. The trait labels used to describe those who are adept at learning—curious, reflective, thoughtful, open—are the types of words that describe good employees, especially good supervisors, managers, and executives.

Notably, Spreitzer et al. (1997) found that Learning Agility did not predict performance, but their research does not indicate that performance and Learning Agility are not correlated. This may be a critical distinction in the analyses employed in hypotheses 4 and 5.

Hypotheses 4 and 5: Learning Agility Accounts for Unique Variance

The purpose of these two analyses was to use stepwise regression to examine all the factors rated by managers that might contribute to or explain the variance in their ratings of performance and potential aside from Learning Agility and then incorporate Learning Agility into the factors to see if it explained a unique and significant portion of the variance.

The findings from these two analyses are among the most interesting study results. First, even though Learning Agility and performance were highly and significantly correlated with each other, the analysis indicated that Learning Agility did not account for a statistically significant, unique portion of the variance in manager ratings of performance. In other words, relative to all of the other factors that managers consider when making judgments about current performance, the participant's Learning Agility did not play a significant role in the manager's evaluation of performance. Its impact seems to be shared with other factors to such a degree that it does not uniquely account for a significant portion of the variance.

However, when the analysis is applied to potential, the findings suggest that Learning Agility accounts for a significant portion of the variance in ratings of potential. In other words, when managers are asked to assess someone's potential for career advancement, they take Learning Agility into consideration as a significant factor. As a matter of fact, Learning Agility (β = .256, p = .020) is the second most highly weighted factor in the regression equation after leading courageously (β = .324, p < .001).

These findings are consistent with Sprietzer et al. (1997) and Dries et al. (2010), but conflict with Eichinger and Lombardo (2000) and Connolly (2001). The findings as they relate to performance in particular also conflict with Hunter and Schmidt (1998) and Wagner and Sternberg (1990), assuming that the constructs they are measuring are equivalent to Learning Agility.

This difference in the importance of Learning Agility when examining performance compared to potential may not be that surprising when considered in the context of a workplace environment. While it may be helpful to seek feedback, reflect on mistakes, and be open to new ideas, effective current performance may not require these traits in any given position. However, recognizing the challenges that occur when transitions are made (Charan et al., 2001; Van Velsor & Leslie, 1995), managers may look to an employee's Learning Agility to gauge his or her ability to successfully make the transition from one level of leadership to another. Put another way, the benchmarks of current performance are often quite tangible and may not rely on strong Learning Agility, while the skills and abilities necessary to advance may be more elusive and may require a person to be more adaptive and learning agile.

Hypothesis 6: Traits and Abilities that Predict Learning Agility

An important part of this research was to search for cognitive abilities and personality traits that are predictive of Learning Agility. The applications for this kind of finding could be widespread. Such results could be used to: identify high-potential employees who could be given additional development opportunities, select employees for positions at any level of leadership, create development programs that build on the cognitive abilities and foster the personality traits associated with strong Learning Agility. However, the present results do not support these types of applications.

Neither the full nor the reduced regression model successfully predicted Learning Agility. However, the full model did identify three scales from the CPI that made significant contributions to the model: Good Impression (Gi), Well-being (Wb), and Achievement by Independence (Ai). As referenced above, the reduced model failed to predict Learning Agility. Furthermore, none of the three scales identified in the full model proved to make a significant contribution to the reduced model. Nonetheless, it is worth considering why those three scales may have risen to the top in the full model.

The Good Impression (Gi) scale was correlated negatively with Learning Agility and accounted for the largest standardized coefficient in the full regression model ($\beta = -.301$, $p = .044$). People with high Gi scores tend to desire acceptance, want approval, and are overly concerned with others' opinions; they are not independent or entrepreneurial (McAllister, 1996). Given that description and that managers tend to be using Learning Agility as a means of evaluating potential for career advancement, it is not surprising that a negative correlation exists. Managers may not consider the "obsequious people-pleasers" that McAllister describes (1996, p. 19) as having

significant leadership potential beyond their current positions. Managers may not believe participants with high Gi scores would take courageous stands such as making unpopular but necessary decisions.

The Well-being (Wb) scale made a significant positive contribution to the model ($\beta = .280$, $p = .021$). Among the three significant factors, Well-being commanded the most significant p-value. People with high Well-being scores tend to be described as comfortable with their current life situation, free of serious doubts or fears, and having a good sense of morale (McAllister, 1996). According to Gough (1996) they are also described as adaptable, efficient, enterprising, self-confident, and stable. These descriptors seem to fall in line with a number of characteristics associated with Learning Agility—flexible, confident, well-balanced—and that may account for the variance in Learning Agility described by Well-being. Yet, people with high Well-being scores are likeable and easy to be around, which may create a halo effect that causes managers to rate long-term potential for advancement higher than it may actually be.

The Achievement by Independence (Ai) scores also made a positive contribution to the model ($\beta = .244$, $p = .037$). People high in Ai are able to be successful in settings where autonomy and independence are required, they are comfortable with ambiguity, and they are innovative and capable of improvising (McAlister, 1996). Gough (1996) describes them as clear-thinking, foresighted, efficient, ambitious, and industrious. McAlister's description in particular seems to align well with descriptions of learning agile people. It is easy to see how managers might associate these characteristics with an individual's potential for career advancement.

It is important to remember that despite some significant contributors to the regression model, cognitive ability and personality traits ultimately were not predictive of Learning Agility. This finding is consistent with Eichinger and Lombardo's (2000) assertion that Learning Agility is a construct distinct from personality and cognitive ability. If we accept the idea that practical intelligence and tacit knowledge are similar constructs to Learning Agility, then these findings also support the research of Connolly (2001), Sternberg et al. (1995), and Wagner and Sternberg (1990) which supports the idea that Learning Agility is not related to general mental ability.

It appears that Eichinger and Lombardo (2000) are right—Learning Agility is a construct that is different from what we measure with personality assessments and tests of cognitive ability. On an intuitive level, this makes a great deal of sense. We all know people who perform well in new environments or operate effectively in conditions of uncertainty and ambiguity. Yet, not all of those successful people are highly intelligent or have similar personality traits, but they are all able to learn from experience and be agile learners.

If personality traits and cognitive abilities are not predictive of Learning Agility, perhaps there are workplace behaviors that are associated with the ability to learn from experience, i.e. behaviors that are not reliant on personality traits or cognitive abilities. To that end, a final analysis was conducted that regressed 15 workplace competencies (see Appendix C) rated by managers on the JPR against ratings of Learning Agility. Less than half of the competencies accounted for a significant portion of the variance in Learning Agility.

An examination of the significant competencies (see Table 10) revealed more information about managers' perceptions of Learning Agility. The competencies called "driving results" and "risk-taking and innovation" seem to overlap with the Achievement by Independence descriptors above, while the "resilience" and "integrity" competencies coincide with the Well-being descriptors. Additionally, it seems that managers place value on "critical thinking" as a necessary part of Learning Agility, though Watson Glaser Critical Thinking Appraisal scores were not significantly correlated with Learning Agility in this study or Connolly's (2001) study. Managers also seem to see "creating alignment" as a skill that relates to Learning Agility. Creating alignment has to do with seeing the big picture and organizing people or initiatives to coalesce around a strategic vision. This is certainly a competency that requires the kind of flexibility and adaptability that is harnessed by those who are adept at learning from experience. Finally, managers value "interpersonal effectiveness" as a factor in Learning Agility. This may be because those who advance professionally need to be able to communicate effectively with peers, subordinates, and superiors. It may also reflect some of the potential halo effect discussed earlier that may be related to high Well-being scores. Further examination of the competencies at the item-level, which would require a significantly larger sample, may provide additional and/or more specific insight into workplace behaviors that relate to Learning Agility.

Implications and Applications

The implications of this research are rather broad. This research provides some clarity to the literature on Learning Agility. It confirms and reinforces some earlier findings, namely that Learning Agility is predictive of potential for advancement

(Spreitzer et al., 1997; Dries et al., 2010) and that Learning Agility is systematically different from cognitive ability and personality (Eichinger & Lombardo, 2000).

Another interpretation is quite different. What if there is no relationship between cognitive ability and/or personality traits and Learning Agility because learning from experience is not reliant on general mental ability or a particular combination of personality traits? Rather Learning Agility may depend on a collection of behaviors that anyone can develop and integrate into their approach to investigating new situations and solving problems. This new perspective might account for the inability to detect any relationships with personality or cognitive ability. Yet, there can be still value in the construct of Learning Agility.

Some colleges and universities are placing a great deal of emphasis on training their students to think critically. The ability to think clearly and critically seems to be embedded in Learning Agility (despite the lack of a significant correlation with the WGCTA). Perhaps those critical thinking initiatives are falling short of their potential. It is possible that their impact could be developed by broadening the curricular approach by integrating other aspects of the Learning Agility construct into the instructional repertoire. For example, maybe there are ways to foster flexibility and self-reflection into the curriculum. Perhaps there are ways to expose students to circumstances that are ambiguous or uncertain.

Counseling training programs focus on building flexibility, ambiguity tolerance, and self-reflection, and thereby arguably foster Learning Agility among their students. Graduate students in counseling programs write reflection papers throughout their training, and counseling practicums are often characterized by uncertainty and

ambiguity. While there may be some preexisting personality characteristics and cognitive abilities that are shared among counseling students, not all counseling students are cut from the same cloth. However, successful students learn to become more self-aware, build confidence and comfort acting in ambiguous situations, and reflect on and learn from their mistakes despite their personality traits and cognitive abilities.

Likewise some corporations have excelled at fostering comfort with uncertainty by assigning employees assignments that stretch them and therefore develop skills and abilities not currently at their disposal. Often, the employees selected for these assignments have already developed or innately maintain some of the characteristics associated with Learning Agility—curiosity, ambition, openness to new ideas or methods. The stretch assignments are intended to foster additional behaviors like flexibility and awareness of strengths and limitations.

Based on the results of this study, it can be stated that Learning Agility is not correlated with personality and cognitive ability. However, it may be more accurate to say that Learning Agility is not dependent on the personality traits or cognitive abilities examined in this study. Framing it in the latter form opens up the possibility that learning from experience is behavioral and can be fostered. Based on the literature in the field and the findings of this study, this seems to be the most parsimonious explanation for the lack of significant relationship between Learning Agility and personality or cognitive ability. A question then left for future research is how to foster Learning Agility behaviors.

Limitations of this Research

  The present study is subject to several limitations. Perhaps most notable are the limitations associated with range restriction. By and large the individuals assessed by the industrial and organizational psychology consulting firm are strong performers in their workplace who are generally seen as having high potential for advancement. Many of the participants in this study share common characteristics. They have above-average cognitive abilities, are highly dominant, and are concerned about the impression they make on others. Many are also engaging and outgoing. The reduction in range serves to compress variability in the sample and potentially reduces the size of correlations. A more heterogeneous sample that better represents the general population might produce more definitive results and yield relationships that are not apparent in the present sample.

  The sample is restricted in other ways, too. Participants from one company comprised three-quarters of the sample, and nearly half of the participants in the sample worked in the sales function. While these are not necessarily limitations in and of themselves, it does limit the generalizability of the study. That said, analyses of variance did not detect any major differences in Learning Agility scores by job function, suggesting that the results may be applicable across workplace functions. No analysis was conducted to detect systematic differences in Learning Agility across employers.

  Another limitation is the degree to which the analysis was conducted and conclusions were drawn based on a single source of data—manager ratings. The managers were not trained raters, and there could be considerable variation in their approach to the JPR and their understanding of the questions. Likewise, manager ratings

tended to be correlated across the instrument, which may in turn inflate some of the correlations examined in the present study. For example, the correlation between Learning Agility and performance and potential may be inflated by virtue of being rated by the same manager. That said, the strength of the observed correlation along with the findings of existing research likely suggest that a relationship does exist between Learning Agility and performance and Learning Agility and potential, though it may not be as strong as the present study suggests.

Recommendations for Future Research

There are a variety of approaches that future researchers could take to address limitations in this study and to investigate new research questions. First, to remedy some of the shortcomings of this research, it would be advisable to collect data from multiple sources to reduce potential bias and potential high correlations found with single raters. One approach would be to collect Learning Agility data using a 360-degree data collection method that would ask peers and subordinates, as well as managers to provide feedback about the participant. This would allow some corroboration of managers' impressions of Learning Agility, as well as performance and potential ratings. Additional analyses could be conducted to determine whether ratings are influenced by the relationship of the rater to the participant.

Additionally, the results of the present study could be replicated with a larger, more diverse and more representative sample. As the industrial and organizational psychology consulting firm continues to collect data for its parallel validation study, the analyses could be revisited with a larger sample. It may be beneficial to grow the sample to better balance the companies and industries that are included as well as the

job functions of participants. This analysis may uncover additional relationships that were obscured by the large portion of the sample coming from one industry and half the sample coming from one job function.

Along the same lines, a larger sample may allow analyses to be conducted by job level. While ANOVA results suggested that there was no significant difference in Learning Agility scores by level (individual contributor, supervisor, manager, executive), there may be undetected differences in cognitive abilities and personality traits that become apparent when the analysis is conducted by job level. Significant results from this analysis conducted at the job level may help to predict who is likely to be successful in making the transition to another leadership level, or what development activities could enhance an individual's ability.

Finally, further dissecting of the job competencies that predict Learning Agility might yield interesting and useful results. A larger sample would allow researchers to examine the competencies at the item-level to see whether certain workplace behaviors seem to be highly correlated with managers' assessments of Learning Agility. This may be another way to determine whether there are any traits or abilities that predict Learning Agility. If certain personality traits are consistently associated with individual workplace behaviors tied to items that are embedded in the competencies that managers find predictive of Learning Agility, a qualitative list of personality traits could be developed and then examined empirically with a larger sample. This information could also be used to develop programs that foster behaviors related to Learning Agility.

Future research need not be limited to workplace settings. Hypothesizing that Learning Agility is not correlated with cognitive ability or personality, it may be

interesting to explore the role that Learning Agility plays in other aspects of life. For example, how is Learning Agility related to mental health? It could be argued that people who are open to new experiences, self-reflective, and curious would make better use and potentially get more out of therapy. Does Learning Agility affect therapy outcomes? Alternatively, if well-being is associated with Learning Agility, does being learning agile potentially serve as a protective factor against mental health issues such as depression? Can the development of Learning Agility behaviors combat mental health problems?

Research opportunities in educational settings might examine student performance in light of Learning Agility. One might expect to see classroom performance more highly correlated with cognitive ability, but see performance in experiential educational opportunities (e.g., internships, practicums, lab-based courses) related to Learning Agility. Likewise, a curriculum designed to foster Learning Agility behaviors could be developed and evaluated. Learning Agility could be used to examine and potentially better understand how first-year students and/or first-generation students adjust to college life and manage what can be a difficult transition.

The present study found that Learning Agility is a construct associated with job performance and potential for advancement, although it only provided unique predictive power in relation to assessing career potential. This study has also provided another data point suggesting that Learning Agility is distinct from cognitive abilities and personality traits. It may be a construct that has not been clearly measured in the past. Examinations focusing on the behaviors rather than the personality traits and cognitive abilities of the

learning agile may provide greater insight into the construct. At this point the

possibilities for future research about Learning Agility are nearly limitless.

References

American College Testing. (1997). *ACT Assessment technical manual.* Iowa City, IA: Author.

Barrick, M., Mount, M., & Strauss, J. (1993). Conscientiousness and performance of sales representatives: Test of the mediating effects of goal setting. *Journal of Applied Psychology, 78,* 715-722.

Barrick, M., Stewart, G., Neubert, M., and Mount, M. (1998). Relating member ability and personality to work-team processes and team effectiveness, *Journal of Applied Psychology, 83,* 377-319.

Bono, J. & Judge, T. (2004). Personality and transformational and transactional leadership: A meta-analysis. *Journal of Applied Psychology, 89*, 901-910.

Briscoe, J.P., & Hall, D.T. (1999). Grooming and picking leaders using competency frameworks: Do they work? An alternative approach and new guidelines for practice. *Organizational Dynamics, 28,* 37-52.

Button, S., Mathieu, J., & Zajac, D. (1996). Goal orientation in organizational behavior research: A conceptual and empirical foundation. *Organizational Behavior and Human Decision Processes, 67*, 26-48.

Charan, R., Drotter, S., & Noel, J. (2001). *The leadership pipeline.* San Francisco: Jossey-Bass.

Connolly, J. (2001). Assessing the construct validity of a measure of learning agility. *Dissertation Abstracts International, 62* (10), 4-B. (UMI No. 3013189)

Corporate Leadership Council (2005). *Realizing the full potential of rising talent.* Washington, DC: Corporate Executive Board.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297-334.

Davis, S., & Barnett, R. (2010) Changing behavior one leader at a time. In R. Silzer, & B. Dowell (Eds.), *Strategy driven talent management: A leadership imperative.* (pp. 349-398). San Francisco, CA: Jossey-Bass.

DeVries, D., & Kaiser, R.B. (2003). *Going sour in the suite.* Paper presented at the Maximizing Executive Effectiveness workshop, Miami, FL., November 17, 2003.

Dries, N., & Pepermans, R. (2008). Real high-potential careers: An empirical study into the perspectives of organizations and high potentials. *Personnel Review, 37,* 85-108.

Dries, N., Vantilborgh, T., & Pepermans, R. (2010) *High potential identification: Examining the developmental perspective.* Manuscript in preparation.

Eichinger, R., & Lombardo, M. (2000). High potentials as high learners. *Human Resource Management, 39*, 321-329.

Eichinger, R., & Lombardo, M. (2004). Learning agility as a prime indicator of potential. *Human Resource Planning, 27*, 12-15.

Francis-Smythe, J., Tinline, G., & Allender, C. (2002). *Identifying high potential police officers and role characteristics.* Presented at the British Psychological Society's 2002 Occupational Psychology Conference.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences.* New York: Basic Books.

Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory

measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality Psychology in Europe*, Vol. 7 (pp. 7-28). Tilburg, The Netherlands: Tilburg University Press.

Goldsmith, M. (2007). *What got you here won't get you there.* New York, NY: Hyperion.

Goleman, D. (1995). *Emotional intelligence: Why it can matter more than I.Q.* New York: Bantam Books.

Gough, H. (1996). *California Psychological Inventory manual.* Palo Alto, CA: Consulting Psychologists Press.

Helson, R., & Moane, G. (1987). Personality and change in women from college to midlife. *Journal of Personality and Social Psychology, 53,* 176-186.

Hoare, C. (2006). Work as a catalyst of reciprocal adult development and learning: Identity and personality. In C. Hoare (Ed.), *Handbook of Adult Learning and Development* (pp. 344-380). New York: Oxford University Press.

Hogan, R., Curphy, G., & Hogan, J. (1994). What we know about leadership. *American Psychologist, 49*, 493-504.

Hogan, R. & Hogan, J. (1997). *Hogan Development Survey manual.* Tulsa, OK: Hogan Assessment Systems.

Hogan, R., Hogan, J., & Roberts, B. (1996). Personality measurement and employment decisions. *American Psychologist, 51*, 469-477.

Hogan, R., Hogan, J., & Warrenfeltz, R. (2007). *The Hogan guide: Interpretation and use of Hogan Inventories.* Tulsa, OK: Hogan Press.

Hogan, R., & Kaiser, R.B. (2005). What we know about leadership. *Review of General*

Psychology, 9, 169-180.

Hough, L.M. & Ones, D.S. (2001). The structure, measurement, validity, and uses of personality variables in industrial, work, and organizational psychology. In N.R. Anderson, D.S. Ones, H.K. Sinangil, and C. Viswesvaran, (Eds.), *Handbook of Industrial, Work, and Organizational Psychology, Vol. 1* (pp. 233-277). New York: Sage

Jones, J.W. & Lewis, B.O. (2005). *Assessing leaders to head of executive derailment.* Presented at IPAT's Strategic Talent Management Briefing, Chicago, November 17, 2005.

Judge, T., Bono, J., Ilies, R., & Gerhardt, M. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology, 87,* 765-780.

Kaiser, R.B. & Craig, S.B. (2005). *How is executive success different?* Presented at the SIOP Fall Consortium, St. Louis, October 28, 2005.

Knowles, M., Holton, E., & Swanson, R. (2005). *The adult learner.* Burlington, MA: Elsevier.

Kudish, J. D. & Hoffman, B. J. (2002, October). *Examining the relationship between assessment center final dimension ratings and external measures of cognitive ability and personality*. Paper presented at the 30th International Congress on Assessment CenterMethods, Pittsburgh, PA.

London, M., & Maurer, T. (2004). Leadership development: A diagnostic model for continuous learning in dynamic organizations. In J. Antonakis, A. Cianciolo, & R. Sternberg (eds.), *The nature of leadership* (pp. 222 – 245). Thousand Oaks, CA: Sage Publications.

London, M., & Smither, J. (1999). Empowered self-development and continuous learning. *Human Resource Management, 38,* 3-15.

Major, D., Turner, J., & Fletcher, T. (2006). Linking proactive personality and the big five to motivation to learn and development activity. *Journal of Applied Psychology, 91,* 927-935.

McAllister, L. (1996). *A practical guide to CPI interpretation* (3rd ed.). Mountain View, CA: CPP.

McCall, M. W. (1988). Developing executives through work experiences. *Human Resource Planning*, 11(1), 1-12.

McCall, M. W. (2004). Leadership development through experience. *Academy of Management Executive*, 18(3), 127-130.

McCall, M., & Lombardo, M. (1983). *Off the track: Why and how successful executives get derailed* (Center for Creatve Leadership Technical Report #21). Greensboro, NC: Center for Creative Leadership.

McCauley, C. (2001). Leader training and development. In S. Zaccaro & R. Klimoski (eds.), *The nature of organizational leadership: Understanding the performance imperatives confronting today's leaders* (pp. 347 – 383). San Francisco, CA: Jossey-Bassey.

MDA Leadership Consulting (2007). *Workplace competency model*. Unpublished instrument. Minneapolis, MN: Author

MDA Leadership Consulting (2009). *Job performance rating form*. Unpublished instrument. Minneapolis, MN: Author

Merriam, S., & Clark, M. (2006). Learning and development: The connection in

adulthood. In C. Hoard (Ed.), *Handbook of adult learning and development* (pp. 27-51). New York: Oxford University Press.

Myers, I.B., McCaulley, M., Quenk, N., & Hammer, A. (1998). *MBTI manual: A guide to the development and use of the Myers Briggs type indicator* (3rd ed.). Palo Alto, CA: Consulting Psychologists Press.

Neisser, U. (1976). General, academic, and artificial intelligence. In L. Resnick, (Ed.), *Human intelligence: Perspectives on its theory and measurements* (pp. 179-189). Norwood, NJ: Ablex.

Ng, T.W., Eby, L.T., Sorenson, K.L., & Feldman, D.C. (2005). Predictors of objective and subjective career success: A meta-analysis. *Personal Psychology, 58*, 367-408.

Polanyi, M. (1976). Tacit knowledge. In M. Marx & F. Goodson (Eds.), *Theories in contemporary psychology* (pp. 330-344). New York: Macmillan.

Psychological Corporation (1994). *Technical manual for the Miller Analogies Test.* San Antonio, TX: Author.

Rose, T., Loewenthal, D., & Greenwood, D. (2005). Counselling and psychotherapy as a form of learning: Some implications for practice. *British Journal of Guidance & Counseling, 33*, 441-456.

Ruch, W., Stang, S., McKillip, R., & Dye, D. (1994). *Employee Aptitude Survey: Technical manual.* (2nd ed). Glendale, CA: Psychological Services, Inc.

Ryan, L.R. (1977). *Clinical interpretation of the FIRO-B.* Palo Alto, CA: Consulting Psychologists Press.

Schmidt, F., & Hunter, J. (1998). The validity and utility of selection methods in

personnel psychology. *Psychological Bulletin, 124*, No. 2, 262-274.

Shipley, W. (1940). A self-administering scale for measuring intellectual impairment and deterioration. *Journal of Psychology, 9,* 371-377.

Smither, J., London, M., & Reilly, R. (2005). Does performance improve following multisource feedback? A theoretical model, meta-analysis, and review of empirical findings. *Personnel Psychology, 58,* 33-66.

Soper, D.S. (2010). The free statistics calculators website [online software]. Retrieved from http://www.danielsoper.com/statcalc/

Spreitzer, G.M., McCall, M.W., & Mahoney, J.D. (1997). Early identification of international executive potential. *Journal of Applied Psychology, 82*, 6-29.

Sternberg, R., Forsythe, G., Hedlund, J., Horvath, J., Wagner, R., Williams, W., Snook, S., & Gringorenko, G. (2000). *Practical intelligence in everyday life.* New York: Cambridge University Press.

Sternberg, R., Wagner, R., Williams, W., & Horvath, J. (1995). Testing common sense. *American Psychologist, 50,* 912-927.

Thurstone, L. L., & Thurstone, T. G. (1947). *SRA primary mental abilities*. Chicago: Science Research Associates.

Van Velsor, E., & Leslie, J.B. (1995). Why executives derail: Perspectives across time and cultures. *Academy of Management Executive, 9,* 62-72.

Van Velsor, E., Moxley, R., & Bunker, K. (2004) The leadership development process. In C.D. McCauley & E. Van Velsor (Eds.), *The Center for Creative Leadership handbook of leadership development* (pp. 204 – 233). San Francisco: Josey-Bass.

VandeWalle, D., Brown, S., Cron, W., & Slocum, J. (1999). The influence of goal orientation and self-regulation tactics on sales performance: A longitudinal field test. *Journal of Applied Psychology, 84*, 249-259.

Wagner, G., & Sternberg, R. (1985). Practical intelligence in real-world pursuits: The role of tacit knowledge. *Journal of Personality and Social Psychology, 49,* 436-458.

Wagner, G., & Sternberg, R. (1990). Street smarts. In K.E. Clark and M.B. Clark (Eds.), *Measures of leadership* (pp. 493-504). West Orange, NJ: Leadership Library of America.

Watson, G., & Glaser, E. M. (1994). *Watson-Glaser Critical Thinking Appraisal*. San Antonio, TX: The Psychological Corporation.

Watson, G., & Glaser, E. M. (2008). *Watson-Glaser Critical Thinking Appraisal.* US: Pearson Education, Inc.

Wechsler, D. (1955). *Wechsler Adult Intelligence Scale*. New York, NY: Psychological Corporation.

Williams, W. (1991). Tacit knowledge and the successful executive. *Dissertation Abstracts International, 52,* 7-B (UMI No. 9136207).

Appendix A

JPR Questionnaire Items

	Competency	Item
1	Interpersonal Effectiveness	Interacts effectively with others regardless of level or background.
2	Interpersonal Effectiveness	Demonstrates consideration and respect for others.
3	Interpersonal Effectiveness	Listens more than talks.
4	Learning Agility	Accepts and acts on feedback from others.
5	Hi Potential	Shows poise and maintains good self-control.
6	Building Collaboration	Expects and encourages others to work together effectively across functions and disciplines.
7	Building Collaboration	Builds a network of relationships and works well with other functions.
8	Building Collaboration	Finds points of agreement between people with different points of view; skilled at resolving conflict.
9	Leading Courageously	Takes charge readily.
10	Leading Courageously	Demonstrates strength of conviction and personal resolve; is willing to take an unpopular position.
11	Leading Courageously	Actively influences upwards and across the organization.
12	Creating Alignment	Makes a compelling case for and builds commitment to organization change plans and initiatives.
13	Creating Alignment	Initiates changes in processes, systems, and/or the organization structure to improve alignment and performance of the department.
14	Creating Alignment	Aligns the work in his/her area to support the overall organization strategy and goals.
15	Team Leadership	Involves team members in decisions and plans that affect them.
16	Team Leadership	Empowers team members to do their job.
17	Team Leadership	Builds agreement and trust within and across teams and groups.
18	Developing Leaders	Establishes plans for hiring, developing, and retaining talent.
19	Developing Leaders	Provides stretch assignments for staff to accelerate their development.
20	Developing Leaders	Provides feedback to staff to strengthen their leadership skills.
21	Strategic Thinking	Makes decisions that reflect a broad and longer-term perspective.
22	Strategic Thinking	Considers industry, market, customer, and competitor information when developing plans.
23	Strategic Thinking	Evaluates the impact of decisions and actions on the

		entire function or business.
24	Business Acumen	Understands how all parts of the organization operate and contribute to the bottom line.
25	Business Acumen	Demonstrates a profit and loss (P&L) perspective.
26	Business Acumen	Uses key financial data to measure performance and make decisions.
27	Critical Thinking & Judgment	Digs below the surface to get at underlying issues when solving problems.
28	Critical Thinking & Judgment	Effectively analyzes and understands complex information.
29	Critical Thinking & Judgment	Thinks holistically; considers multiple factors when making decisions.
30	Planning & Organizing	Gives sufficient time to longer-term and strategic planning activities.
31	Planning & Organizing	Develops plans that are integrated and aligned with the organization's strategy.
32	Planning & Organizing	Provides the resources that others need to move forward.
33	Learning Agility	Is flexible; adjusts his/her approach when something doesn't work.
34	Hi Potential	Is disciplined, reliable, and responsible.
35	Managing Execution	Skilled in getting things done in a complex organization.
36	Managing Execution	Clarifies others' roles and accountabilities for accomplishing objectives.
37	Managing Execution	Sets aggressive timelines for achieving objectives.
38	Managing Execution	Intervenes as necessary to ensure that desired results are achieved.
39	Managing Execution	Drives performance in a manner that supports the strategy and improves profitability.
40	Drive for Results	Demonstrates a strong personal drive and determination to achieve results.
41	Drive for Results	Establishes high standards of performance.
42	Drive for Results	Focuses on activities that make a difference to organizational success.
43	Hi Potential	Is competitive; wants to succeed and win.
44	Hi Potential	Shows initiative; is energetic and self-directed.
45	Learning Agility	Is curious and inquisitive.
46	Innovation & Risk-Taking	Thinks about issues and opportunities in new and innovative ways.
47	Innovation & Risk-Taking	Encourages imaginative ideas, resourcefulness, and ingenuity.
48	Innovation & Risk-Taking	Supports experimentation and intelligent risk-taking to develop new processes or products.
49	Resilience	Responds effectively to changes and challenges.

50	Resilience	Remains focused and effective under pressure.
51	Resilience	Remains optimistic in the face of obstacles or problems.
52	Learning Agility	Is self-aware; knows own strengths and limitations.
53	Hi Potential	Is confident and self-assured.
54	Integrity	Demonstrates commitment to high standards of professionalism, honesty, and fairness.
55	Integrity	Builds trust and credibility by being direct and straightforward.
56	Integrity	Demonstrates a commitment to the organization's values.
57	Learning Agility	Displays a desire to gain new knowledge and skills.
58	Learning Agility	Actively pursues personal growth and improvement.
59	Hi Potential	Desires greater responsibility and advancement.
60	Learning Agility	Seeks out challenges and new experiences.
61	Learning Agility	Is open-minded and receptive to change and new ideas.
62	Learning Agility	Reflects on and learns from mistakes.
63	Overall Judgments	To what extent do you agree that the questions in this survey represent skills and behaviors that are necessary for success in the individual's job?
64	Overall Judgments	Compared to others you have known in similar roles, how would you rate this individual's job performance?
65	Overall Judgments	Compared to others in similar positions, how much is this person able to accomplish?
66	Overall Judgments	Compared to others in similar positions, how high is the quality of this individual's work?
67	Overall Judgments	Compared to others you have known in similar roles, how would you rate this individual's ability to meet expectations and requirements of internal and/or external customers?
68	Overall Judgments	Compared to others you have known in similar roles, how would you rate this individual's overall ability to succeed in an more senior or more critical leadership position in the future?
69	Overall Judgments	How would you rate this individual's desire for advancement?
70	Overall Judgments	Compared to others you have known in similar roles, how would rate this individual's commitment to the organization?
71	Overall Judgments	To what extent do you believe this individual is committed to their own learning and development?
72	Overall Judgments	How familiar are you with this person's performance in his or her current role?

Appendix B

Learning Agility Items

1.   Is curious and inquisitive.
2.   Accepts and acts on feedback from others.
3.   Is flexible; adjusts his/her approach when something doesn't work.
4.   Is self-aware; knows own strengths and limitations.
5.   Displays a desire to gain new knowledge and skills.
6.   Actively pursues personal growth and improvement.
7.   Seeks out challenges and new experiences.
8.   Is open-minded and receptive to change and new ideas.
9.   Reflects on and learns from mistakes.

Appendix C

MDA Competency Model

DIMENSION	COMPETENCY	DEFINITION
Leading People	**Leading Courageously**	Is strong-willed, resolute, and appropriately tough-minded. Displays courage and a willingness to take a stand. Advocates and defends his/her ideas and positions effectively. Comfortable with managerial authority and responsibility. Influences and negotiates successfully across organizational boundaries. Skilled at influencing upwards.
	Creating Alignment	Implements change that improves integration and interaction between teams and units in support of the organization's priorities, plans, and goals. Communicates, builds commitment to, and aligns people behind the direction of the business and the organization. Establishes clear line of sight between individual roles and organizational objectives. Manages change effectively.
	Team Leadership	Is an effective team leader. Harnesses the energy of the group. Capitalizes on interdependencies. Uses leadership power to motivate others to do their job. Involves others in decisions and plans that affect them. Trusts reports while maintaining appropriate controls. Builds consensus and cohesion within and across teams and groups to ensure mutual and cooperative effort.
	Developing Leaders	Acquires and retains the talent needed to implement team and business objectives. Is committed to the training and development of managers; helps staff members reach their potential. Provides stretch assignments, coaching, and feedback to reports to enhance their personal and leadership effectiveness. Holds reports accountable for managerial work and gaining success through others.
Thinking and Deciding	**Strategic Thinking**	Brings a broad perspective to bear on issues and problems. Demonstrates systems thinking. Has an external orientation and an awareness of the marketplace, competitors, and customer needs. Understands functional strategy and proposes initiatives that support the function and its relationship to the strategy for the business.
	Business Acumen	Understands the organization and its business model; helps others understand how the organization operates; its internal dynamics, policies, and procedures; and how it makes money. Raises issues and makes recommendations in light of implications and consequences for the business. Has financial acumen; uses key financial information to measure and analyze the team's performance and contribution.
	Critical Thinking and Judgment	Demonstrates the ability to critically analyze, synthesize, and manage complex information to develop well-reasoned solutions to problems. Absorbs information and verifies it is complete and correct. Considers many variables and options in problem-solving. Digs below the surface for underlying issues. Sees patterns, and makes connections. Handles ambiguity well. Reaches decisions with effective timing; and is objective, decisive, and action-oriented.

DIMENSION	COMPETENCY	DEFINITION
Achieving	**Drive for Results**	Demonstrates strong personal drive to accomplish goals. Conveys a passion to achieve results that exceed expectations. Is motivated by challenges and determined in the face of setbacks. Fully values managerial work. Shows initiative and persistence. Is energetic and self-directed. Is competitive. Finishes tasks and projects with marked success and high quality. Maintains a focus on what makes a difference to customers; and the success and performance of the team and the organization.
	Risk-Taking and Innovation	Appropriately challenges the status quo, examines assumptions, and embraces new approaches. Demonstrates innovative thinking and supports experimentation and intelligent risk-taking to develop new ideas to improve performance.
Relating to People	**Interpersonal Effectiveness**	Interacts and communicates effectively with multiple levels, layers and stakeholders. Is considerate, empathetic, and approachable. Listens effectively and elicits the right information from others. Tolerant of differences in people and ways of doing things. Respects others' perspectives and contributions regardless of differences in cultural background or ethnicity.
	Building Collaboration	Develops good relationships and models the importance of working together in a joint effort. Breaks down silos and effectively integrates and manages the interface between groups. Encourages and expects employees at all levels to work together effectively across functions, disciplines, and/or other groups. Skilled at resolving conflict.
Managing Work	**Planning and Organizing**	Establishes clear goals, priorities, and action plans to achieve business outcomes. Anticipates and thinks ahead. Maintains a short and long term-view. Ties activities to business goals. Effectively deploys and reallocates resources to ensure that others have what they need to move forward.
	Managing Execution	Helps others clarify and understand their role, responsibilities, and accountabilities. Sets realistic timelines for achieving objectives and reliably follows through. Directs performance, and intervenes as appropriate to ensure success and smooth flow of work. Removes obstacles, follows up, and drives toward closure. Monitors progress, and drives short-term performance in a manner that satisfies customers' needs, and supports business goals and improved profitability.
Managing Self	**Resilience**	Understands his/her strengths and vulnerabilities, and demonstrates healthy self-acceptance, and confidence. Confidently adapts and adjusts to changes and challenges; maintains a positive outlook. Works constructively under pressure and maintains a sense of realistic optimism. Recovers quickly from setbacks or disappointments.
	Integrity	Demonstrates principled leadership and an uncompromising commitment to the highest standards of professionalism, honesty, and fairness. Operates from a clear sense of well-developed personal values and standards. Shows consistency in actions. Is trustworthy, authentic, and credible. Models admirable corporate citizenship in his/her behavior.
	Learning Agility	Actively pursues personal growth and improvement. Possesses curiosity, a desire for new knowledge, and a drive for personal mastery. Learns quickly and easily. Open-minded; acknowledges where others have more expertise in their areas. Solicits feedback. Reflects on and learns from mistakes.

Appendix D

Learning Agility Scale, Performance, and Potential Correlation Matrix

	Variable	M	SD	Min	Max	Range	1	2	3
1	LA Score	5.024	0.897	2.33	7.00	4.67	1		
2	Performance	5.534	1.284	1.00	7.00	6.00	.778**	1	
3	Potential	4.949	1.405	1.00	7.00	6.00	.767**	.823**	1
4	Gender	0.255	0.437	0.00	1.00	1.00	.008	-.025	-.051
5	Time Since Assmnt	24.959	7.603	6.00	40.00	34.00	-.074	-.070	-.086
6	Job Level	2.517	0.861	1.00	4.00	3.00	.001	.012	.039
7	Attained Education	3.351	0.783	1.00	4.00	3.00	.002	-.120	.007
8	Job Function	7.347	3.238	1.00	11.00	10.00	-.078	-.032	.000
9	EAS-6	11.882	3.273	0.50	20.00	19.50	.078	.061	.070
10	EAS-7	15.058	5.264	0.00	27.00	27.00	.113	.068	.149*
11	WGCTA	62.000	8.800	31.00	78.00	47.00	.059	.041	.037
12	Excitable	43.170	23.813	16.00	100.00	84.00	-.074	-.085	-.128*
13	Skeptical	46.755	25.381	4.00	97.00	93.00	.036	-.058	-.022
14	Cautious	40.796	25.413	11.00	100.00	89.00	-.047	-.074	-.102
15	Reserved	42.456	25.416	1.00	100.00	99.00	.008	.012	-.019
16	Leisurely	44.071	25.913	1.00	100.00	99.00	-.051	-.059	-.110
17	Bold	53.735	28.214	1.00	98.00	97.00	.042	-.056	.011
18	Mischievous	56.741	27.463	1.00	100.00	99.00	-.014	-.119*	.011
19	Colorful	64.486	25.219	2.00	100.00	98.00	-.035	-.144*	-.051
20	Imaginative	50.939	25.776	1.00	99.00	98.00	.044	-.037	.020
21	Diligent	60.306	27.348	1.00	100.00	99.00	.015	-.025	-.031
22	Dutiful	54.262	26.603	0.00	99.00	99.00	-.013	-.062	-.038
23	Do	68.755	7.515	44.00	80.00	36.00	.047	-.041	-.002
24	Cs	60.934	6.632	40.00	72.00	32.00	.007	-.034	.006
25	Sy	60.467	7.001	30.00	75.00	45.00	-.006	-.044	.025
26	Sp	56.374	7.311	32.00	74.00	42.00	.101	.041	.115
27	Sa	60.677	6.276	36.00	74.00	38.00	.028	-.064	.026
28	In	62.787	6.022	41.00	79.00	38.00	.042	.034	.069
29	Em	62.271	7.993	33.00	88.00	55.00	-.020	-.075	.021
30	Re	58.434	6.713	33.00	71.00	38.00	-.004	.049	.016
31	So	57.137	5.881	43.00	67.00	24.00	-.049	-.015	-.031
32	Sc	61.150	7.459	38.00	74.00	36.00	-.071	.074	.018
33	Gi	67.033	9.025	45.00	86.00	41.00	-.056	.041	.015
34	Wb	61.011	5.147	40.00	65.00	25.00	.070	.084	.083
35	To	60.565	6.322	42.00	71.00	29.00	.020	.086	.058
36	Ac	62.550	6.067	45.00	72.00	27.00	.009	.034	.027
37	Ai	62.087	6.580	45.00	76.00	31.00	.067	.078	.104
38	Ie	60.077	5.899	48.00	71.00	23.00	.065	.086	.088
39	Py	60.975	6.501	41.00	75.00	34.00	-.001	.042	.039
40	Fx	51.554	9.494	30.00	72.00	42.00	.054	.105	.111
41	FM	42.355	7.699	23.00	64.00	41.00	-.035	.007	-.032

Note. *. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

	Variable	4	5	6	7	8	9	10
1	LA Score							
2	Performance							
3	Potential							
4	Gender	1						
5	Time Since Assmnt	.021	1					
6	Job Level	-.016	-.116*	1				
7	Attained Education	.144	.021	.101	1			
8	Job Function	-.365**	.021	-.193**	-.277**	1		
9	EAS-6	.031	-.018	.013	.238**	-.175**	1	
10	EAS-7	.216**	-.013	.044	.160*	-.320**	.437**	1
11	WGCTA	.143*	-.065	.075	.292**	-.355**	.482**	.561**
12	Excitable	.046	.003	.055	-.102	-.075	.035	.038
13	Skeptical	-.025	.187**	-.031	-.158*	.110	.024	-.040
14	Cautious	.113	.056	-.076	-.044	-.059	.104	.055
15	Reserved	.029	-.043	.071	-.058	-.158**	.173**	.098
16	Leisurely	-.066	.070	.039	.028	-.053	.047	-.018
17	Bold	.029	.210**	-.011	.130	.087	-.054	-.085
18	Mischievous	-.258**	.097	.006	.049	.219**	.002	-.090
19	Colorful	-.043	.109	.058	.113	.104	-.112	-.004
20	Imaginative	-.050	.067	-.045	.124	.021	.094	.035
21	Diligent	-.153**	.011	-.238**	-.162*	.191**	-.088	-.208**
22	Dutiful	-.016	.014	-.252**	-.050	.103	.046	-.027
23	Do	-.071	.049	.106	-.007	.057	-.107	.037
24	Cs	.172**	.017	.022	.167*	-.100	.065	.128*
25	Sy	.063	.094	-.077	.151	.078	.005	.041
26	Sp	.148*	.045	.057	.169*	-.078	.144*	.203**
27	Sa	-.010	.032	.031	.115	-.078	.128*	.221**
28	In	-.111	-.040	.137*	-.033	-.078	-.067	.038
29	Em	.158**	.020	.001	.181*	-.078	.051	.146*
30	Re	.096	-.036	.030	.010	-.078	.000	.101
31	So	.214**	.053	-.058	.124	-.078	.083	.041
32	Sc	.014	-.006	-.066	-.044	-.078	-.114	-.160**
33	Gi	-.090	.029	-.096	-.038	-.078	-.116	-.208**
34	Wb	-.034	-.029	-.050	.018	-.078	-.086	-.043
35	To	.193**	-.188**	.045	.175*	-.078	.107	.211**
36	Ac	.079	.026	.014	.129	-.078	-.047	.028
37	Ai	.215**	-.115	.006	.286**	-.078	.164**	.273**
38	Ie	.185**	-.035	.077	.241**	-.078	.211**	.318**
39	Py	.083	-.142*	.151*	.186*	-.078	.145*	.192**
40	Fx	.204**	-.093	.070	.119	-.078	.161**	.231**
41	FM	.600**	-.001	-.004	.042	-.078	.020	.078

Note. *. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

	Variable	11	12	13	14	15	16	17
1	LA Score							
2	Performance							
3	Potential							
4	Gender							
5	Time Since Assmnt							
6	Job Level							
7	Attained Education							
8	Job Function							
9	EAS-6							
10	EAS-7							
11	WGCTA	1						
12	Excitable	.050	1					
13	Skeptical	-.146*	.233**	1				
14	Cautious	.067	.371**	.156**	1			
15	Reserved	.114	.377**	.242**	.474**	1		
16	Leisurely	-.038	.204**	.316**	.284**	.281**	1	
17	Bold	-.116*	-.118*	.322**	-.135*	-.119*	.127*	1
18	Mischievous	-.123*	-.095	.328**	-.182**	-.040	.020	.393**
19	Colorful	-.053	-.154**	.109	-.364**	-.300**	-.090	.466**
20	Imaginative	.021	-.078	.148*	-.070	-.058	.122*	.357**
21	Diligent	-.221**	.007	.192**	.057	.038	.170**	.268**
22	Dutiful	-.049	-.010	-.048	.242**	-.005	.155**	-.008
23	Do	-.007	-.226**	-.054	-.488**	-.319**	-.157**	.282**
24	Cs	.145*	-.222**	-.175**	-.259**	-.260**	-.218**	.114
25	Sy	.028	-.257**	-.109	-.375**	-.433**	-.161**	.255**
26	Sp	.164**	-.105	-.103	-.271**	-.254**	-.183**	.131*
27	Sa	.177**	-.064	.012	-.248**	-.151*	-.103	.198**
28	In	.106	-.178**	-.167**	-.391**	-.144*	-.234**	-.022
29	Em	.187**	-.292**	-.226**	-.210**	-.295**	-.150*	.085
30	Re	.174**	-.266**	-.335**	-.265**	-.214**	-.230**	-.108
31	So	.072	-.254**	-.154**	-.088	-.147*	-.157**	-.046
32	Sc	-.035	-.312**	-.313**	-.140*	-.111	-.183**	-.218**
33	Gi	-.163**	-.453**	-.331**	-.357**	-.304**	-.276**	-.048
34	Wb	-.010	-.488**	-.386**	-.393**	-.277**	-.371**	-.107
35	To	.324**	-.201**	-.522**	-.126*	-.115	-.319**	-.221**
36	Ac	.026	-.283**	-.286**	-.237**	-.223**	-.147*	.123*
37	Ai	.347**	-.193**	-.382**	-.104	-.158**	-.269**	-.152*
38	Ie	.412**	-.199**	-.390**	-.172**	-.108	-.327**	-.123*
39	Py	.273**	-.136*	-.224**	-.072	-.033	-.090	-.193**
40	Fx	.315**	-.047	-.308**	-.043	-.098	-.148*	-.357**
41	FM	.080	.072	-.093	.218**	.040	.041	-.094

Note. *. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

	Variable	18	19	20	21	22	23	24
1	LA Score							
2	Performance							
3	Potential							
4	Gender							
5	Time Since Assmnt							
6	Job Level							
7	Attained Education							
8	Job Function							
9	EAS-6							
10	EAS-7							
11	WGCTA							
12	Excitable							
13	Skeptical							
14	Cautious							
15	Reserved							
16	Leisurely							
17	Bold							
18	Mischievous	1						
19	Colorful	.357**	1					
20	Imaginative	.351**	.363**	1				
21	Diligent	.029	.036	.051	1			
22	Dutiful	-.126*	-.107	.069	.276**	1		
23	Do	.237**	.546**	.195**	.103	-.092	1	
24	Cs	.087	.296**	.160**	-.102	-.067	.557**	1
25	Sy	.231**	.499**	.282**	.006	.026	.611**	.703**
26	Sp	.221**	.375**	.237**	-.197**	-.042	.468**	.573**
27	Sa	.313**	.444**	.285**	-.065	-.091	.623**	.611**
28	In	.161**	.236**	.079	-.193**	-.335**	.601**	.460**
29	Em	.131*	.368**	.257**	-.151*	.024	.494**	.621**
30	Re	-.228**	.048	-.130*	.032	-.059	.488**	.551**
31	So	-.177**	-.033	-.177**	.012	.046	.278**	.383**
32	Sc	-.381**	-.310**	-.360**	.046	.000	.119*	.209**
33	Gi	-.130*	-.037	-.185**	.102	-.001	.326**	.309**
34	Wb	-.045	.073	-.058	-.074	-.097	.491**	.519**
35	To	-.378**	-.100	-.072	-.166**	-.032	.282**	.489**
36	Ac	-.197**	.139*	-.086	.104	.036	.518**	.534**
37	Ai	-.164**	.048	.021	-.226**	-.001	.318**	.590**
38	Ie	-.103	.038	.021	-.238**	-.084	.430**	.615**
39	Py	-.120*	-.114	.037	-.139*	-.063	.284**	.553**
40	Fx	-.158**	-.037	.011	-.508**	-.146*	.052	.357**
41	FM	-.406**	-.174**	-.120*	-.053	.103	-.080	.149*

Note. *. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

	Variable	25	26	27	28	29	30	31
1	LA Score							
2	Performance							
3	Potential							
4	Gender							
5	Time Since Assmnt							
6	Job Level							
7	Attained Education							
8	Job Function							
9	EAS-6							
10	EAS-7							
11	WGCTA							
12	Excitable							
13	Skeptical							
14	Cautious							
15	Reserved							
16	Leisurely							
17	Bold							
18	Mischievous							
19	Colorful							
20	Imaginative							
21	Diligent							
22	Dutiful							
23	Do							
24	Cs							
25	Sy	1						
26	Sp	$.690^{**}$	1					
27	Sa	$.644^{**}$	$.612^{**}$	1				
28	In	$.462^{**}$	$.451^{**}$	$.519^{**}$	1			
29	Em	$.599^{**}$	$.530^{**}$	$.511^{**}$	$.356^{**}$	1		
30	Re	$.389^{**}$	$.247^{**}$	$.331^{**}$	$.405^{**}$	$.417^{**}$	1	
31	So	$.331^{**}$	$.163^{**}$	$.225^{**}$	$.244^{**}$	$.339^{**}$	$.504^{**}$	1
32	Sc	.027	$-.188^{**}$	-.070	$.220^{**}$	$.117^{*}$	$.568^{**}$	$.516^{**}$
33	Gi	$.283^{**}$	.007	.041	$.294^{**}$	$.211^{**}$	$.568^{**}$	$.454^{**}$
34	Wb	$.514^{**}$	$.370^{**}$	$.390^{**}$	$.569^{**}$	$.445^{**}$	$.582^{**}$	$.541^{**}$
35	To	$.308^{**}$	$.295^{**}$	$.257^{**}$	$.405^{**}$	$.444^{**}$	$.616^{**}$	$.418^{**}$
36	Ac	$.472^{**}$	$.261^{**}$	$.385^{**}$	$.376^{**}$	$.422^{**}$	$.677^{**}$	$.579^{**}$
37	Ai	$.426^{**}$	$.473^{**}$	$.442^{**}$	$.401^{**}$	$.582^{**}$	$.480^{**}$	$.381^{**}$
38	Ie	$.466^{**}$	$.505^{**}$	$.446^{**}$	$.509^{**}$	$.552^{**}$	$.584^{**}$	$.420^{**}$
39	Py	$.320^{**}$	$.376^{**}$	$.352^{**}$	$.385^{**}$	$.385^{**}$	$.490^{**}$	$.311^{**}$
40	Fx	$.281^{**}$	$.447^{**}$	$.269^{**}$	$.336^{**}$	$.351^{**}$	$.146^{*}$	.107
41	FM	-.019	.032	-.026	-.034	$.119^{*}$	$.217^{**}$	$.323^{**}$

Note. *. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

	Variable	32	33	34	35	36	37	38	39	40
1	LA Score									
2	Performance									
3	Potential									
4	Gender									
5	Time Since Assmnt									
6	Job Level									
7	Attained Education									
8	Job Function									
9	EAS-6									
10	EAS-7									
11	WGCTA									
12	Excitable									
13	Skeptical									
14	Cautious									
15	Reserved									
16	Leisurely									
17	Bold									
18	Mischievous									
19	Colorful									
20	Imaginative									
21	Diligent									
22	Dutiful									
23	Do									
24	Cs									
25	Sy									
26	Sp									
27	Sa									
28	In									
29	Em									
30	Re									
31	So									
32	Sc	1								
33	Gi	$.783^{**}$	1							
34	Wb	$.568^{**}$	$.682^{**}$	1						
35	To	$.511^{**}$	$.425^{**}$	$.591^{**}$	1					
36	Ac	$.562^{**}$	$.569^{**}$	$.583^{**}$	$.484^{**}$	1				
37	Ai	$.345^{**}$	$.328^{**}$	$.489^{**}$	$.639^{**}$	$.474^{**}$	1			
38	Ie	$.345^{**}$	$.295^{**}$	$.568^{**}$	$.641^{**}$	$.525^{**}$	$.717^{**}$	1		
39	Py	$.347^{**}$	$.326^{**}$	$.466^{**}$	$.538^{**}$	$.452^{**}$	$.632^{**}$	$.573^{**}$	1	
40	Fx	.052	.015	$.254^{**}$	$.427^{**}$	.051	$.558^{**}$	$.409^{**}$	$.413^{**}$	1
41	FM	$.281^{**}$	.045	.028	$.328^{**}$	$.180^{**}$	$.286^{**}$	$.208^{**}$	$.160^{**}$	$.209^{**}$

Note. *. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).