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Conceptualizing Learning Agility and Investigating its Nomological Network

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CONCEPTUALIZING LEARNING AGILITY AND INVESTIGATING ITS

NOMOLOGICAL NETWORK

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To: Dean Michael R. Heithaus
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This dissertation, written by Josh Allen, and entitled Conceptualizing Learning Agility and Investigating its Nomological Network, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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DEDICATION

I dedicate this dissertation my wife Kristin Allen for her support and patience through this process. I would also like to dedicate this dissertation to my mother Rhonda for encouraging me that I could accomplish anything I set my mind to.

ABSTRACT OF THE DISSERTATION

CONCEPTUALIZING LEARNING AGILITY AND INVESTIGATING ITS

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by

Josh Allen

Florida International University, 2016

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Professor Chockalingam Viswesvaran, Major Professor

This dissertation consists of two studies examining the utility and distinctiveness of learning agility in the workplace. The first study examines the nomological networks of two proprietary measures of learning agility in sample of 832 individuals. The learning agility simulation is designed to be an objective measure of learning agility ability. The learning agility indicator is a self-report measure designed to measure the preference towards learning agile behaviors. The results of study one indicate two different nomological networks for the learning agility simulation and the learning agility indicator. Specifically, the learning agility simulation was related to cognitive personality variables (i.e., tolerance for ambiguity and cognitive flexibility) and cognitive ability, and the learning agility indicator was more strongly related to personality variables.

The second study explores the work-related outcomes associated with the learning agility simulation, and the incremental validity of the learning agility simulation over traditional predictors of performance (i.e., Big Five personality variables, cognitive ability). The second study was performed with a sample of early career employees with supervisor rated performance/potential measures in a sample of 89 paired responses. The

results of study two indicated that the learning agility simulation was significantly related

to two areas of employee potential (learning from experience and speed-to-competence)

and provided incremental validity over traditional predictors of performance/potential for

these areas of performance.

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I. CHAPTER I: INTRODUCTION

Typically, organizations identify the top performers within their ranks for opportunities to climb the organizational ladder. This practice is founded on the belief that a high performing individual at one level will continue to be high performer at a higher level. The logic is fairly sound given that one of the best predictors of future performance is past behavior (Quinones, Ford & Teachout, 1995). In fact, some of the most common selection tools use past behavior (e.g., previous employment, school performance, references, biodata, work experience). However, this assumes that the new situation will be the same as the previous one. In the case of a promotion or the evolving demands of today's rapidly changing workplace, the work environment and tasks rarely remain stagnant and the type of work an individual does rarely stays the same throughout one's career (Quinones & Ehrenstein, 1997).

Many individuals are not successful after receiving a promotion, or a transition in responsibilities, prompting researchers to consider why some individuals thrive in a new role and other individuals fail. One variable that shows promise for explaining this relationship is the individual difference among people that enables some to learn from their experiences and apply this knowledge to excel in new situations or jobs. This ability to learn from experience and apply that knowledge to future situations can be thought of as an individual's learning agility (Lombardo & Eichinger, 2000). In fact, researchers point out that it is the responsibility of employees to "learn for a living" (Molloy & Noe, 2010).

LEARNING AGILITY

Although there has been a debate over the precise definition of learning agility (cf. DeReu, Ashford & Myers, 2012; De Meuse, Dai, Swisher, Eichinger, & Lombardo, 2012), it is broadly defined as a willingness and ability to learn from experience, and subsequently apply that learning to perform successfully under new or first-time conditions (Lombardo & Eichinger, 2000). Despite learning agility being a relatively new construct of interest, it is quickly being identified as key component of an individual's long term career success (Lombardo & Eichinger, 2000; 2004). The theoretical basis for learning agility is rooted in the adult learning research, and self-regulated learning, as an individual difference in the way people learn (Flavell, 1979; McCall, 1988; McCall & Lombardo, 1983; Rose, Loewenthal, & Greenwood, 2005). Specifically, individuals do not automatically learn from experience with equal success.

Learning agility is an emerging construct of interest for both academics and practitioners, and more work is necessary to provide further clarity into the conceptual definition of learning agility (Noe, Clarke, & Klein, 2014). Learning agility is believed to relate to an individual's current work performance, future potential, and the ability to learn from developmental opportunities (e.g., Bedford, 2012; Connolly, 2001; De Meuse, Dai, Hallenbeck, & Tang, 2008). In order to demonstrate the usefulness of learning agility as a construct, more research is necessary to distinguish it from other related constructs (e.g., informal learning, cognitive flexibility, openness to experience, general mental ability; Wang & Beier, 2012).

The workplace is an environment where employees can build new skills that can ultimately lead to better performance and opportunities to advance their careers.

However, only a portion of this learning happens during formal settings, as researchers estimate that up to 75% of learning happens informally (Baer, Tompson, Morrison, Vickers, & Paradise, 2008). This informal learning leads to a discrepancy of learning among employees, as determined by individual characteristics, explaining the differences in the amount informal learning across employees. In addition, even when presented with the opportunity to learn, not all individuals learn the same lessons nor are able to apply that learning in situations where it would be beneficial. Informal learning includes aspects such as self-reflection, learning from others (e.g., peers and supervisors), and searching for learning materials (e.g., relevant books and articles; Doornbos, Simmons & Denessen, 2008; Lohman 2005). Ultimately, there is more opportunity for informal learning than formal learning, and informal learning allows for development of new skills while on the job.

One individual difference that can help explain differences in individual learning and knowing how and when to apply what is learned, is an individual's learning agility. Learning agility has been identified as a key component of an individual's long term success in the workplace (Lombardo & Eichinger, 2000; 2004). Learning agility involves a willingness and ability to learn, as well as being able to apply that learning to new situations (Lombardo & Eichinger, 2000).

Having developmental experiences are crucial to continued success, but just being exposed to them is relatively worthless if nothing is learned from the experience (McCauley, 2001). According to McCauley (2001), individuals who learn from experiences have a strong learning orientation, or the tendency to see life as a series of learning opportunities. They take a proactive stance toward problems and opportunities,

take initiative, and enjoy problem solving. Additionally, they reflect on experiences, and look at opportunities and approaches critically. Lastly, they are open to new ideas and opportunities – displaying both a willingness and an ability to change depending on situations and environments.

PURPOSE OF THE DISSERTATION

The purpose of this dissertation is to determine the utility and distinctiveness of learning agility in the workplace. In order to achieve this purpose, this dissertation consists of two studies. The first study is designed to assess the nomological network of learning agility. The second study is designed to explore the work-related outcomes associated with learning agility.

Study One. The purpose of study one is to investigate the nomological network of learning agility. Specifically, study one seeks to determine the convergent and discriminant validity of learning agility and other related and unrelated constructs. This study uses an objective measure of learning agility, designed to measure the ability component of learning agility, in conjunction with a self-report measure of learning agility, designed to measure the motivation or preference towards learning agile behaviors. In addition to the learning agility measures, various personality measures related to learning agility (e.g., goal orientation, Big Five personality variables, tolerance for ambiguity) and cognitive ability measures (i.e., inductive reasoning and verbal reasoning) are administered. These measures are used to explore the relationships between learning agility and related constructs.

Study Two. As a follow up to the examination of the nomological network of learning agility in study one, study two investigates the relationship between learning agility and employee outcomes. Specifically, study two gathers supervisor ratings of performance and potential outcomes in addition to the objective learning agility measure, cognitive ability measures, and similar personality measures that are completed by the employee in study one. Study two is a criterion-related validity study as it examines the relationship between learning agility and important criterion of interest (i.e., work performance and potential). Study two examines the validity of the learning agility simulation as well as the incremental validity of the learning agility simulation over other more traditional predictors of performance (i.e., cognitive ability, personality).

SIGNIFICANCE OF DISSERTATION

Applied practitioners have performed the bulk of research on learning agility. As such, rigorous research is necessary to determine the usefulness of learning agility as a construct. This dissertation will fill several gaps in the understanding of learning agility. Specifically, study one determines the relationship between learning agility and several related and unrelated constructs, many of which have not been explored in studies to date (e.g., cognitive flexibility). These relationships are examined using two measures of learning agility. One measure is an objective assessment designed to measure an individual's learning agility ability. The other is a self-report measure designed to measure an individual's preference towards learning agile behaviors. Study two determines the relationship and incremental validity of learning agility and supervisor rated performance and potential. In addition to examining the construct and criterion-

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related validity of a predictor, in personnel selection, it is also important to assess if there are demographic group differences that could potentially result in adverse impact. As such, both studies investigate the relationship between learning agility and demographic variables to address the concern for potential adverse impact.

This dissertation has practical implications for both academics and practitioners. Specifically, study one helps to clarify learning agility's distinctness as a construct. Study two examines the relationship between learning agility and performance in a sample of early career employees. Because most measures of learning agility are proprietary, the cost associated with administering the assessments has limited much of the research to senior level and executive populations, thus early career employees have been understudied (discussed in more detail in Chapter II). Both studies address notable gaps in the learning agility research.

SUMMARY

Learning agility is a popular new variable of interest, and as such, research is needed to clarify its uniqueness and utility as a construct. In this dissertation, I explore both the construct and criterion-related validity of learning agility. Study one investigates the nomological network of learning agility and study two investigates the criterion-related validity of learning agility. This research is important to clarify and further the understanding of learning agility and its work related applications.

The next chapter will provide a detailed literature review of the research on learning agility relevant to this dissertation.

II. CHAPTER II: LITERATURE REVIEW

In this chapter I review the literature on learning agility and develop the hypotheses that are tested in this dissertation. This chapter starts with a review of the literature on self-regulated learning, metacognition, and fluid intelligence. Next, I discuss the characteristics of learning agile individuals. Third, I discuss the different methods of measuring learning agility. Fourth, I discuss the differences in preference and ability with regards to learning. Next, I discuss the use of simulations as an assessment tool. Sixth, I present research between learning agility and individual differences, including: goal orientation, the Big Five, cognitive flexibility, tolerance for ambiguity, openness to feedback, motivation to learn, and cognitive ability. Seventh, I discuss the research between learning agility and work performance. Eighth, I present the research regarding the relationship between learning agility and employee potential. Ninth, I discuss the potential of learning agility to add incremental validity above more traditional predictors (e.g., cognitive ability and personality). Finally, I discuss the research regarding learning agility and demographic variables (i.e., gender, age and ethnicity).

SELF-REGULATED LEARNING, METACOGNITION, AND FLUID INTELLIGENCE

The purpose of employee training is to teach individuals a set of skills that they are expected to apply to more complex situations than those present in the training environment (Baldwin & Ford, 1988). Learning agility is similar to a training program where an individual is expected to transfer learning from one environment to another. However, the learning that an individual needs to perform successfully on the job cannot only take place during controlled, formal training environments. The primary difference

between learning agility and learning received from a training program is that learning agility concerns all the experiences that an individual has, and the ability to transfer relevant learning from those experiences into new settings.

The role of self-regulated learning and metacognition has been extensively studied within the context of training and learning environments (Sitzman & Ely, 2011). However, only a small portion of on-the-job learning actually occurs in the classroom or during a formal setting (Brown & Sitzmann, 2011). Therefore, self-regulated learning and metacognition likely play an essential role throughout an individual's work career, influencing the way and amount that an individual learns. The self-regulated learning framework provides a good foundation for how learning agility can occur, specifically the underlying principles of metacognition, learning about learning.

Self-regulated learning is defined as an individual's ability to understand and control one's own learning environment (Schraw, Crippen, & Hartley, 2006). Self-regulated learning is generally considered to consist of three components: cognition, reflection on cognition (or metacognition), and motivation (Schraw et al., 2006). Cognition refers to skills like problem solving strategies and strategies to memorize and recall information. Metacognition refers to the ability to understand and monitor cognitive processes, and make necessary adjustments. Motivation refers to the beliefs that impact the use and development of cognitive and metacognitive skills. All three areas are generally believed to be necessary to achieve maximum performance (Schraw et al., 2006; Zimmerman, 2000).

Cognition, with regards to self-regulated learning, consists of three different components: cognitive strategies, problem solving strategies, and critical thinking skills

(Schraw et al., 2006). Cognitive strategies refer to individual strategies a learner employs to learn something (e.g., writing down what was taught). Problem solving strategies refer to the development of problem solving strategies. Critical thinking strategies refer to a variety of skills such as identifying the credibility of information, comparing it to previous knowledge, and using the information to draw new conclusions (Linn, 2000).

Metacognition refers to an individual's knowledge of and regulation of one's own cognitions (Flavell, 1979). Metacognition can also be thought of as what an individual knows about one's own cognitions (i.e., metacognitive knowledge) and how they use that knowledge to regulate their cognition (i.e., metacognitive control processes; Schraw & Moshman, 1995). The regulation of cognition, or metacognitive control process, is made up of three components: planning, monitoring, and evaluating (Kluwe, 1987). Planning involves using the appropriate strategies and using resources to positively impact performance (Miller, 1985). Monitoring refers to knowledge and awareness of cognition and performance (Schraw & Moshman, 1995). Evaluation refers to assessing the process of learning and performance (Schraw & Moshman, 1995).

Individuals with more metacognitive skills are believed to perform better because they are able to recognize when they are having difficulties and employ strategies to overcome those difficulties (Ford, Smith, Weissbein, Gully, & Salas, 1998; Pintrich, 2002). Good learners appear to have more knowledge about their cognition and learning and are more likely to use that knowledge to improve learning (Garner, 1987). In fact, there is evidence that teaching metacognitive skills can help improve performance (e.g., Meloth, 1990; Pintrich, 2000; Volet, 1991). Similarly, a study by Ford and colleagues (1998) found that metacognition was the most important strategy for learning outcomes.

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Additionally, motivation plays a role in self-regulated learning through components such as goal setting and self-efficacy. Different individual aspects such as learning goal orientation (discussed in detail later in this chapter) are involved and drive the type of self-regulated learning an individual is exposed to (Choi & Jacobs, 2011). The relationship between motivation and self-regulated learning is likely complex, however, because setting difficult goals may create a pressure to perform and may create ineffective strategies (Earley, Connolly, & Ekegren, 1989). Additionally, research suggests that self-efficacy and the Big Five personality traits alone cannot explain self-regulated learning (Noe, Tews & Marand, 2013; Noe et al., 2014) prompting researchers to consider other factors related to self-regulated learning.

Fluid cognition, or fluid intelligence, is similar to self-regulated learning. Fluid intelligence is defined as the reasoning processes that take place while in a new or novel situation (Cattell, 1963). Fluid intelligence is more of an all-purpose cognitive process that is not necessarily associated with any one domain (Kane & Engle, 2002). Fluid intelligence consists of inhibiting irrelevant information and activating pertinent information appropriate for the given circumstance. Fluid intelligence likely plays a large role in the cognitive and metacognitive processes described in self-regulated learning. Fluid intelligence is also very similar to the ability to transfer learning to a new or novel environment portion of learning agility. Although fluid intelligence is likely a key component of self-regulated learning and learning agility, it is likely only one piece of the puzzle.

Self-regulated learning and metacognition are often studied in terms of their individual components (e.g., goal orientation, motivation, self-regulation, procedural

knowledge). Additionally, many of the self-regulated processes may not be conscious,

which makes their measurement very difficult (Brown, 1987). Given the characteristics

of learning agile individuals (discussed in the next section), conceptually self-regulated

learning and metacognition are very similar to learning agility. However, learning agility

adds the component of knowing when to apply that learning to new environments, which

is consistent with a combination of self-regulated learning and fluid intelligence.

Therefore, the possibility exists that learning agility can contribute to a more holistic

measurement of self-regulated learning, metacognition processes, and fluid intelligence.

CHARACTERISTICS OF LEARNING AGILE INDIVIDUALS

Although there is currently a debate as to the precise definition of learning agility,

there has been a plethora of research highlighting the characteristics of learning agile

individuals (e.g., Bedford, 2012; De Meuse, Dai & Hallenbeck 2010; Lombardo &

Eichinger, 2000; London & Maurer, 2004; Reed, 2012; Van Velsor, Moxley & Bunker

2004). Learning agility is generally defined as a willingness and ability to learn from

experience and apply that learning to new settings (Lombardo & Eichinger, 2000). These

characteristics include: 1) learning the "right lessons" and applying that learning to new

situations, 2) pursuing developmental activities, 3) being open-minded regarding new

ideas or methods, 4) seeking feedback from others about their performance, 5) being self-

critical and able to objectively evaluate own performance, 6) drawing practical

conclusions from experience, 7) possessing an awareness and the ability to leverage

strengths and weaknesses, and 8) demonstrating the willingness and confidence to

experiment and not be discouraged by setbacks.

Other traits of learning agile individuals are identified by Jones, Rafferty and Griffin (2006) and include the ability to manage uncertainty, tolerate ambiguity and complex situations, and anticipate the need for change. The identification of learning agile individuals is important considering that it is estimated that only about 10% of managers are learning agile (Williams, 1997). Additionally, Van Velsor and colleagues (2004) suggest that individuals who are high in learning agility display an ability to learn from mistakes and are not discouraged by setbacks.

The conceptualization of learning agility described by DeReu and colleagues (2012) includes both cognitive and behavioral characteristics. This definition of learning agility focuses on the speed and flexibility associated with learning. These authors identify three cognitive components of learning agility associated with ability, including: 1) prospective cognitive simulations such as visualizations or imagining future scenarios and applying past experience; 2) counterfactual thinking or imagining what other scenarios could have happened with past events; and 3) pattern recognition, perceiving complex events and making connections. The behavioral characteristics highlighted by DeReu and colleagues associated with willingness include: 1) seeking feedback, 2) experimentation, and 3) reflecting on lessons of experience.

Although the DeReu and colleagues' (2012) conceptualization of learning agility focuses on the speed and flexibility and the De Meuse and colleagues' (2012) conceptualization of learning agility focuses on willingness and ability, fundamentally the definitions are very similar. For example, both conceptualizations of learning agility include: 1) seeking feedback, 2) considering other possibilities, 3) critical evaluation, and 4) open-mindedness. Despite this debate on precisely what the definition of what learning

agility is (see De Meuse, et al., 2012; DeReu et al., 2012), researchers seem to have converged on the understanding that learning agility involves 1) exhibiting the willingness to change, 2) incorporating feedback, 3) taking risks and experimenting, and 4) reflecting on previous events.

It is important to note that the most common definition of learning agility (e.g., De Meuse et al., 2010; 2012; Lombardo & Eichinger, 2000; 2004) is made up of two key components: willingness and ability. The willingness portion of learning agility represents areas such as being motivated to look for developmental opportunities, seeking feedback, and remaining open minded. The ability portion of learning agility refers to recognizing developmental opportunities and learning the "right lessons". The ability component of learning agility is marked by knowledge of when to apply learning, the ability to recognize patterns, the ability to critically evaluate performance, and the ability to consider other possibilities. According to this definition, in order for someone to be learning agile, he/she would need to exhibit both the motivational and ability components.

The concept of learning agility can also be seen in the research regarding adaptive performance (Pulakos, Arad, Donovan, & Plamondon. 2000) and learning from prior experience (Day, Zaccaro & Halpin, 2004). Pulakos and colleagues (2000) found eight factors of adaptive performance: handling emergencies, handling work stress, solving problems creatively, dealing with uncertain situations, learning interpersonal adaptability, cultural adaptability and physically oriented adaptability. To maximize adaptive performance, Mueller-Hanson, White, Dorsey, and Pulakos (2005) recommended early and frequent exposure to training experiences that call for adaptive responses. They

indicated soldiers should have numerous and diverse opportunities to apply the lessons learned, receive feedback, and then apply the lessons again.

MEASURING LEARNING AGILITY

In order to better understand learning agility as a construct, it is important to consider the measurement of learning agility. Thus, in this section I describe four different measures of learning agility. The direct measurement of learning agility has been very difficult considering that individuals low in learning agility tend to overestimate their own learning agility and those individuals high in learning agility tend to underestimate their own learning agility (De Meuse et al., 2008; Dunning, Heath & Suls, 2004). This had led to a multi-rater approach to measure learning agility (cf. Eichinger, Lombardo, & Capretta, 2010). To date, the Choices Questionnaire developed by Lominger (Lombardo & Eichinger, 2000) and now administered by Korn/Ferry has likely been the most commonly used measure of learning agility. The difficulty in measuring learning agility has limited the usefulness of learning agility in selection or assessment of new employees. However, there have recently been some new advances in the measurement of learning agility. Self-report measures of learning agility have been recently developed (i.e., viaEDGE and learning agility indicator) and an objective measure of learning agility has been recently developed (learning agility simulation).

Choices Questionnaire. The Choices Questionnaire is a measure of learning agility that was developed by Lombardo and Eichinger (2000). The Choices Questionnaire consists of 81 behaviors that are rated by someone who knows the target individual well (i.e., supervisor or coworker). Lombardo and Eichinger (2000) developed

the items after an analysis of executive interviews and survey data. The data set included items that were specifically geared towards learning orientation or reflected the ability to apply learning to novel situations.

The Choices Questionnaire measures learning from experience, or "Learning II" (to differentiate it from the types of learning that aid memory, analysis, comprehending new information or cognitive ability). The questionnaire measures the potential of an individual to learn and perform in new challenging situations. The authors of the Choices Questionnaire (Lombardo & Eichinger, 2002) performed two studies to determine the characteristics of someone who is learning agile. This research included a series of studies with executives (Lindsey, Homes & McCall, 1987) and an intervention study with fifty-five managers (Lombardo & Eichinger, 2002). As a result, the factor analysis of the data collected using the Choices Questionnaire revealed four factors of learning agility: people agility, results agility, mental agility, and change agility.

- **Mental agility** describes individuals who think through problems from a fresh point of view, are comfortable with complexity, ambiguity, and explaining their thinking to others.

- **People Agility** describes individuals who know themselves well, learn from experience, treat others constructively, and are resilient under the pressures of change.

- **Results Agility** describes individuals who achieve results under tough conditions, inspire others to perform beyond normal, and exhibit the sort of presence that builds confidence in others.

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- **Change Agility** describes individuals who are comfortable with and look forward to experiencing new situations and challenges (Lombardo & Eichinger, 2000).

Learning agility has been found to be relatively stable with test- retest reliability coefficients (30-day interval) ranging from 0.81 to 0.90 for the different facets of learning agility as measured by the Choices Questionnaire (Lombardo & Eichinger, 2002).

viaEDGE. The viaEDGE was developed in 2011 to assess learning agility (Korn/Ferry, 2015). Unlike the Choices Questionnaire, the viaEDGE is completed online via self-report. The viaEDGE consists of three sections. The first section contains personality-based items rated on a 5-point Likert scale, the second section contains biodata items, and the third section consists of situational judgment test (SJT) items (Korn/Ferry. 2015). The viaEDGE is comprised of five factors of learning agility. The original four factors identified for the Choices Questionnaire (mental agility, people agility, results agility and change agility) were retained and, a fifth factor titled "self-awareness" was added. Self-awareness measures the degree to which one is insightful regarding his or her personal strengths and limitations, and uses this knowledge to perform well.

To validate the viaEDGE, data were collected from approximately 1000 individuals from twelve organizations representing a variety of industries. Factor analysis of these results supported the hypothesized five-factor structure. Additionally, the viaEDGE displayed strong convergent and divergent validity, adequate internal consistency and showed no evidence of adverse impact (De Meuse, Dai, Eichinger, Page, Clark & Zwedie, 2011). Specific results from this validation are discussed in further detail later in this chapter.

Learning Agility Indicator. More recently additional measures have been developed to measure learning agility. For example, the learning agility simulation and learning agility indicator were developed in 2012 by an Industrial/Organizational psychology consulting firm to measure two of the essential components of learning agility (ability and motivation).

The learning agility indicator is designed to measure the preference, or motivational component of learning agility. The indicator is a self-report measure of learning agility designed to measure three different areas of learning agility preferences. These three different areas are exploring, imagining and examining.

- **Exploring** measures the preference toward taking on a variety of opportunities.
- **Imagining** measures the preference toward being creative and innovative.
- **Examining** measures the confidence in ability and taking risks.

The Learning Agility Indicator is completed online and provides a self-report score of an individual's preference toward learning agile behaviors.

Learning Agility Simulation. The learning agility simulation was developed as a more objective way to measure learning agility. It is designed to measure the ability component related to learning agility. The learning agility simulation is a video-based simulation that is designed to measure three facets of the ability component of learning agility. The three different facets measured are: observing, connecting and assessing.

- **Observing** measures the ability to store and gather information.
- **Connecting** measures the ability to recognize patterns and changes in patterns.

- **Assessing** measures the willingness to search for and incorporate feedback. The assessing component also measures the ability to objectively evaluate performance.

Unlike the Choices Questionnaire which employs ratings of learning agility completed by others, the learning agility simulation is completed online by the individual to assess him/herself. However, unlike many self-report measures, the learning agility simulation offers an opportunity to assess abilities through a variety of exercises, resulting in an objective score of an individual's learning agility.

USE OF SIMULATIONS IN EMPLOYEE SELECTION

Simulations have a long history of use in employee selection and are becoming increasingly prevalent in recent years (Boyce, Corbet, & Adler, 2013). In addition to an increase in use, improvements in computing and availability of broadband connections have also allowed simulations to become much more complex (Bruk-Lee, Drew, & Hawkes, 2013; Hawkes, 2013; Holland & Lambert, 2013). These more advanced simulations are taking place in graphic rich environments and can feature 3D animations and graphics (Hawkes, 2013). The result is much more realistic simulations for lower costs, which had been a primary barrier to previous use (Boyce et al., 2013). The use of gaming features are also being used increasingly (e.g., badges, scores), creating a more engaging user experience (e.g., Holland & Lambert, 2013). In addition, simulations have generally positive applicant reactions, good criterion-related validity, and incremental validity over traditional predictors of performance (Bruk-Lee, Lanz, Drew, Coughlin,

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Levine, Tuzinski, & Wren, 2016; Kinney & O'Connell, 2012; Scmitt & Mills, 2001; Schmidt et al., 2006; Truxillo & Bauer, 2008).

As described in the characteristics of learning agile individuals, learning agility is a complex construct that creates difficulties during measurement. Because of the difficulties in measuring learning agility, such as individuals difficulty in self-reporting learning agility (Meuse et al., 2008; Dunning et al., 2004), simulations offer a unique opportunity for assessment. The flexibility in simulations allow for the measurement of a broad range of knowledge, skills, and abilities (Boyce et al., 2013). In addition, performance based assessments are less influenced by faking and social desirability than personality tests and interviews (Boyce et al., 2013). Thus, simulations may offer an objective way to measure the complex construct of learning agility.

PREFERENCE AND ABILITY OF LEARNING AGILITY

The classic equation of performance posits that performance = motivation x ability (Heider, 1958). Meaning that performance is a combination of ability and motivation and is not only how competent an individual is at something or how much he/she is motivated to do it. Motivation can also be described as a preference towards certain behaviors.

There is strong meta-analytic evidence showing the relationship between ability and job performance (e.g., Hunter & Hunter, 1984; Schmidt & Hunter, 1998). However, it is likely that preference interacts with ability in predicting performance. Empirical support for the complicated relationship between ability and preference is found in the multitasking literature. In a study of 119 working individuals, Sanderson, Bruk-Lee,

Viswesvaran, Gutierrez and Kantrowitz (2013) found a non-significant correlation between measures of multitasking ability and polychronicity (preference for multitasking behavior). However, these researchers also found that polychronicity moderated the relationship between multitasking ability and job performance, where the relationship between multitasking ability and job performance was stronger when polychroncity was high.

As highlighted in the characteristics of learning agile behaviors section, learning agility is comprised of both the ability for learning agility and the preference towards learning agile behaviors. Accordingly, part of this study is exploratory to determine if there is a difference found in the nomological networks of the ability and preference for learning agility as measured by the learning agility simulation and the learning agility indicator. Because of the exploratory nature of this study, the hypotheses will be the same for both the learning agility simulation and the learning agility indicator. However, there may be significant differences in the nomological networks of the learning agility simulation and the learning agility indicator. Thus, hypotheses will be tested independently for learning agility simulation and learning agility indicator.

LEARNING AGILITY AND INDIVIDUAL DIFFERENCES

Learning agility has been found to be a relatively stable individual difference (e.g., Lombardo & Eichinger, 2002). Conceptually, learning agility has been linked to a variety of other individual differences (e.g., goal orientation, the Big Five, cognitive ability; e.g., DeReu et al., 2012). However, the empirical investigations of the relationship between learning agility, personality, and cognitive ability measures have

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been largely inconclusive (e.g., Bedford, 2012; Connolly, 2001; Dries & Pepperman, 2008; Ogisi, 2006). This section will highlight the research focused on the relationships between learning agility and various individual differences including: goal orientation, the Big Five personality variables, tolerance for ambiguity, cognitive flexibility, motivation to learn, and cognitive ability.

Learning Agility and Goal Orientation. Goal orientation has been shown to be a stable individual difference variable comprised of two factors: learning goal orientation and performance goal orientation (Button, Mathieu & Zajac, 1996). Learning goal orientation is characterized as a desire for learning opportunities (Button et al., 1996). Individuals with a learning goal orientation seek to improve their abilities, acquire new skills and master new situations (Bell & Kozlowski, 2002; Dweck & Elliot, 1983; VandeWalle, Ganesan, Challagalla & Brown, 2000). Learning goal oriented individuals focus on building new competencies, where performance goal oriented individuals focus on meeting expected standards of competence (e.g., Button et al., 1996; VandeWalle, 1997).

Performance goal orientation is characterized by a desire to obtain easy success and avoidance of situations that will be too difficult. Individuals with a performance goal orientation seek to validate their successes and avoid negative judgments. The conceptualization of performance goal orientation runs contrary to many of the characteristics of learning agility. Specifically, performance goal oriented individuals are less likely to experiment and are likely to avoid any feedback that would run contrary to their beliefs.

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On the other hand, learning agility is conceptually very similar to learning goal orientation. Wong, Haselhuhn and Kray (2012) suggest that individuals that have a high learning goal orientation are more likely to reflect on experiences, and learn from those experiences (two characteristics of learning agility). Additionally, goal orientation influences the interpretation of feedback, particularly negative feedback, which is another characteristic of learning agility (Farr, Hofmann, & Ringenbach, 1993; VandeWalle & Cummings, 1997). Specifically, individuals with a learning goal orientation are more likely to seek feedback because of a desire to learn and develop skills. In a study of 319 salespeople in two Fortune 500 companies, VandeWalle and colleagues (2000) found that learning goal orientation was positively related to feedback seeking behavior ($r = .17$).

Additionally, a conclusion of the goal orientation research is that learning goal orientation is associated with a greater motivation to learn (Colquitt & Simmering, 1998), improved performance after receiving feedback (VandeWalle, Cron, & Slocum, 2001), and a greater capacity to learn from challenging developmental experiences (DeReu & Wellman, 2009; Dragoni, Tesluk, Russell & Oh, 2009). The increases in motivation to learn, improved performance after feedback, and learning from developmental experiences associated with learning goal orientation suggests an important relationship between learning goal orientation and learning agility.

DeReu and colleagues (2012) suggest that learning goal orientation is an important factor in determining one's learning agility. In a study of nearly 1000 employees, researchers found a positive correlation between learning goal orientation and learning agility (measured with the viaEDGE; $r = .42$; De Meuse et al., 2011). Conversely, in a study of police officers, Connolly (2001) did not find evidence of a

relationship between learning agility and goal orientation. Therefore, the relationship between learning agility and goal orientation needs further clarification and may not bear the straightforward relationship that seems clear by a review of the literature. As De Meuse and colleagues (2010) conclude, "the ability to learn from challenging and difficult job experiences requires much more than simply possessing a learning goal orientation" (p.126). On the basis of the theoretical overlap and lack of conclusive empirical support, I hypothesize that:

Hypothesis 1a: The learning agility simulation will be positively related to learning goal orientation.

Hypothesis 1b: The learning agility indicator will be positively related to learning goal orientation.

Hypothesis 2a: The learning agility simulation will be negatively related to performance goal orientation (proving and avoiding).

Hypothesis 2b: The learning agility indicator will be negatively related to performance goal orientation (proving and avoiding).

Learning Agility and the Big Five Personality Traits. The Big Five personality framework is a widely used and recognized theory of personality (Barrick & Mount, 1991). The Big Five traits include conscientiousness, openness to experience, neuroticism (or emotional stability), agreeableness, and extraversion. The Big Five personality traits are used often in employee selection and have been found to be related to job performance and potential, as well as leadership emergence and performance (e.g., Barrick & Mount, 1991; Judge, Bono, Ilies & Gerhardt, 2002). However, research

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empirically linking the Big Five personality traits to learning agility is lacking (Bedford, 2012).

The motivation to learn, one component of learning agility, has been linked theoretically (Davis & Barnett, 2010; London & Smither, 1999) and empirically (Major, Turner & Fletcher, 2006) to openness to experience. Major and colleagues (2006) found that openness to experience was significantly correlated with motivation to learn ($r =$ .42). The finding of Major and colleagues (2006) is not surprising considering that openness to experience consists of elements such as flexibility and intellectual curiosity (Costa & McCrae, 1992). Individuals who are high in openness to experiences have a strong intellectual curiosity, actively seek new experiences and ideas, and are more willing to change (Costa & McCrae, 1992). Being open to new experiences might contradict previous learning and experiences and force individuals to adapt to new scenarios (DeReu et al., 2012). Similarly, Eichinger and Lombardo (2000) describe learning agility as a tendency to be open to new ideas and people. However, Dries and Peppermans (2008) did not find a significant relationship between learning agility and openness to experience in a study of high potential employees. In an unpublished dissertation, Connolly (2001) found that learning agility, as measured by the Choices Questionnaire, did not correlate significantly with any of the Big Five personality traits. However, he did find a small but significant correlation between openness to experience and change and mental agility (subfactors of the Choices Questionnaire). Thus, more research is necessary to determine the relationship between openness to experience and learning agility. On the basis of the theoretical link and the shortage of empirical research, I hypothesize that:

Hypothesis 3a: The learning agility simulation will be positively related to openness to experience.

Hypothesis 3b: The learning agility indicator will be positively related to openness to experience.

As previously mentioned, research between learning agility and the Big Five personality traits has been scant (particularly with the exception of openness to experience). Costa and McCrae (1992) outlined the different dimensions of the Big Five personality traits. Conscientiousness is characterized by a tendency to be ordered and dutiful, and exhibit a preference toward planned behavior. Agreeableness is characterized by a tendency to be compassionate, cooperative, and trusting. Neuroticism is characterized as a tendency experience unpleasant emotions and lacking emotional stability (the opposite is true for emotional stability). Extraversion is characterized as a tendency to experience positive emotions and be energized by the company of others.

Connolly (2001) did not find any significant relationships between learning agility and conscientiousness, agreeableness, neuroticism, or extraversion. However, Dries and Pepperman (2008) found many traits associated with extraversion, conscientiousness, and agreeableness were correlated with high potential employees, suggesting that these traits may also be related to learning agility. Ogisi (2006) found a moderate correlation between learning agility and each of the Big Five ($r = .20 - .39$), but these relationships were found using a self-rated measure of learning agility that was developed for use by ratings provided by others. Research regarding learning agility and the Big Five personality variables is unclear but still in the nascent stage, and more work needs to be

done to clarify what, if any, relationships exist between learning agility and extraversion, conscientiousness, agreeableness, and neuroticism.

Research Question 1a: What is the relationship between the learning agility simulation and agreeableness, conscientiousness, extraversion, and neuroticism?

Research Question 1b: What is the relationship between the learning agility indicator and agreeableness, conscientiousness, extraversion, and neuroticism?

Learning Agility and Cognitive Flexibility. Cognitive flexibility refers to an individual's awareness there are alternatives available in any situation, a willingness to adapt to the situation, and confidence in being flexible (Martin & Rubin, 1995). Cognitive flexibility denotes an individual who is adaptable or flexible (as the name implies) and has been found to be negatively related to rigidity in research studies (Martin & Rubin, 1995). Dennis and Vander Wal's (2010) definition of cognitive flexibility focuses on 1) the tendency to perceive difficult situations as controllable, 2) the ability to perceive multiple alternative explanations for life occurrences and human behavior, and 3) the ability to generate multiple alternative solutions to difficult situations.

In a study of 419 employees from three different manufacturing companies in Taiwan, Chung, Su and Su (2012) found that cognitive flexibility was positively related to self-reflection and negatively related to resistance to change. Similarly, in a study with 83 participants, Hamtiaux and Houssemand (2012) found that cognitive flexibility was positively related to adaptability and negatively related to rigidity. These findings and the definitions of cognitive flexibility overlap with the characterizations of learning agility (particularly those of DeReu and colleagues (2012)). Furthermore, Lombardo and

Eichinger (2005) rate cognitive flexibility as one of the constructs that is most closely related to learning agility. However, to date there has not been a study conducted to explore the relationship between learning agility and cognitive flexibility.

> *Hypothesis 4a: The learning agility simulation will be positively related to cognitive flexibility.*
>
> *Hypothesis 4b: The learning agility indicator will be positively related to cognitive flexibility.*

Learning Agility and Tolerance for Ambiguity. Tolerance for ambiguity refers to the way individuals respond to uncertain or complex situations and environments (Furnham & Ribchester, 1995). Specifically, tolerance for ambiguity reflects an individual's comfort level operating in environments or situations that are complex or unclear. Individuals with a low tolerance for ambiguity experience stress and try to avoid ambiguous situations, whereas individuals with a high tolerance for ambiguity see ambiguous situations as exciting or challenging (Furnham & Ribchester, 1995). Bochner (1965) described characteristics of ambiguity tolerance including: the need for categorization, certainty, rigidness, and creativity. Individuals with a low tolerance for ambiguity seem to be more prone to stress and risk aversion.

Tolerance for ambiguity has been linked theoretically and empirically to feedback seeking behaviors (one component of learning agility), with individuals high in tolerance for ambiguity soliciting more feedback about performance and potential for advancement (Bennet, Herold & Ashford, 1990). Bennet and colleagues (1990) concluded that tolerance for ambiguity influences feedback seeking behaviors.

Tolerance for ambiguity likely influences many behaviors in the workplace; however, there is a need for additional empirical evidence (Furnham & Ribchester, 1995). In a historic example, Sears identified talent for the executive level by identifying individuals with a high tolerance toward different people and ideas (Bentz, 1967). It seems evident that in order to succeed, particularly at higher levels in an organization, there needs to be some level of comfort with ambiguous situations. White and Shullman (2010) propose that acceptance of ambiguity is an important indicator of the effectiveness of a leader; however, tolerance for ambiguity is rarely included as a critical trait for effective leaders (Heifetz, Grashow, & Linsky, 2009).

When considering characteristics of learning agility, such as the willingness to experiment and the tendency to be open-minded, there seems to be a link between learning agility and tolerance for ambiguity. A primary component of learning agility is the ability to deal with uncertain environments and make good decisions (DeReu et al., 2012), reflecting a clear theoretical link between tolerance for ambiguity and learning agility. In fact, Lombardo and Eichinger (2005) rate tolerance for ambiguity as the construct most closely related to learning agility. According to the diagnostic research completed by Korn/Ferry, learning agility and tolerance for ambiguity are the most important predictive factors for executive success (Lombardo, 2003). However, the empirical research linking learning agility to tolerance for ambiguity is scant. In one research study of approximately 1000 employees from various industries, researchers found a significant relationship between learning agility (measured using the viaEDGE) and tolerance for ambiguity ($r = .36$; De Meuse et al., 2011). Despite the theoretical link

between learning agility and tolerance for ambiguity, further empirical testing is necessary to determine the relationship between these two constructs.

Hypothesis 5a: The learning agility simulation will be positively related to tolerance for ambiguity.

Hypothesis 5b: The learning agility indicator will be positively related to tolerance for ambiguity.

Learning Agility and Openness to Feedback. The seminal work by Ashford and Cummings (1983) found that feedback at work is an important resource for employees to correct performance issues and advance their careers. Feedback can help employees evaluate their work behavior, and learn ways to improve performance that they may not have learned on their own (Ashford & Tsui, 1991; Morrison, 1993). Additionally, having the proper lines of feedback in organizations can ultimately lead to better organizational performance (London, 2003).

Ashford and Cummings (1983) describe two different ways that individuals seek feedback: 1) monitoring the environment and others for cues, and 2) asking others for feedback directly. In addition to seeking feedback, individuals vary regarding the degree to which they accept feedback. Openness to feedback represents an individual's propensity to accept and incorporate feedback (Smither, London & Reilly, 2005). The likelihood of improving performance using feedback depends on whether the individual believes that change is possible and the desire to improve performance (Smither et al., 2005).

The receptivity to feedback can be categorized as an individual's feedback orientation. Feedback orientation influences how an individual receives, processes, and

incorporates feedback (London & Smither, 2002). Specifically, feedback orientation is related to making behavioral changes after feedback, and working to improve performance. London and Smither's (2002) conceptualization of feedback orientation represents a variety of different components including: propensity to seek feedback, propensity to mindfully process feedback, sensitivity to the way one is viewed by others, valuation of feedback, and the feeling one must act on feedback. Additionally, feedback orientation should be more related to learning goal orientation than performance goal orientation (discussed previously; Dweck, 1986). This difference in relationships is based on the important role that feedback plays during the learning process (Squires & Adler, 1998). Conversely, those individuals with performance goal orientation often avoid failure, are more sensitive than individuals with less performance goal orientation to negative feedback, and therefore would seek to avoid potentially damaging feedback.

Feedback orientation has been found to be significantly related to other individual differences (e.g., learning goal orientation, affect; Linderbaum & Levy, 2010). In a study of 172 mid to senior level managers, Braddy, Sturm, Atwater, Smither and Fleenor (2013) found that openness to feedback was significantly related to likelihood to change (as rated by an executive coach). Being open to feedback, and willing to incorporate feedback, is an important component of learning agility, however this openness and willingness to incorporate feedback represents only one area of learning agility. There has not been much research to date exploring the relationship between learning agility and openness to feedback. However, given the theoretical overlap and empirical support between openness to feedback and constructs related to learning agility, I hypothesize that:

Hypothesis 6a: The learning agility simulation will positively be related to openness to feedback.

Hypothesis 6b: The learning agility indicator will positively be related to openness to feedback.

Learning Agility and Motivation to Learn. Motivation to learn refers to an employee's motivation to learn training program materials (Noe, 1986). As evident in the definition, this conceptualization of motivation to learn is applicable solely in work environments and specifically refers to training materials. However, as previously mentioned, training can happen in a variety of contexts (i.e., formal and informal) and has a variety of different mediums (e.g., other employees, books and materials). Another definition of motivation to learn is that it reflects the direction, intensity, and persistence of learning-directed behavior, and has been found to be positively related to learning performance in a meta-analytic study (Colquitt, LePine, & Noe, 2000).

Motivation to learn is a strong predictor of actual learning and influences other individual factors (e.g., Baldwin, Magjuka, & Loher, 1991; Colquitt et al., 2000; LePine, LePine, & Jackson, 2004; Noe, 1986; Noe & Wilk, 1993). For example, the motivation to learn has been found to be positively related to learning goal orientation and negatively related to performance goal orientation (Colquit & Simmering, 1998; Klein, Noe & Wang, 2006). Motivation to learn is one important component of learning agility, as highlighted in the characteristics of learning agile individuals. However, to date, there has not been much empirical research between learning agility and motivation to learn. One study investigating this relationship found that motivation to develop was significantly

related to learning agility in a study of 89 army leaders (Reed, 2012). Therefore I hypothesize that:

Hypothesis 7a: The learning agility simulation will be positively related to motivation to learn.

Hypothesis 7b: The learning agility indicator will be positively related to motivation to learn.

Learning Agility and Cognitive Ability. Cognitive ability testing has been used for many years as an effective predictor of employee performance (Schmidt & Hunter, 1998). In fact, meta-analytic evidence has found that cognitive ability is the single best predictor of job performance across jobs (Schmidt & Hunter, 1998). However, group differences found on cognitive abilities and adverse impact concerns have made organizations increasingly leery of using cognitive ability during selection (Outtz, 2002).

Given the characteristics of learning agile individuals (e.g., learning the "right" lessons and knowing when to apply them, and recognizing patterns and change) cognitive ability is likely a factor relating to learning agility. DeReu and colleagues (2012) suggest that cognitive ability will influence learning agility by enabling individuals to process information faster through increases in working memory. Additionally, they propose that cognitive abilities will influence flexibility by increasing the ability to see patterns and move across ideas more easily.

Similar to many other variables discussed (e.g., openness to feedback, tolerance for ambiguity), there is still a need for more empirical research to determine the relationship between cognitive ability and learning agility. Theoretical (DeReu et al., 2012) and empirical (e.g., Connolly, 2001; Ogisi, 2006) research has offered conflicting

views regarding the relationship between learning agility and cognitive ability. Connolly (2001) found that learning agility was not correlated with a measure of cognitive abilities and suggested learning agility is a unique construct, free of influence from cognitive abilities. In an unpublished master's thesis, Ogisi (2006) found a moderate correlation between learning agility and cognitive abilities ($r = .20 - .35$ for the different facets of learning agility). A clear limitation of the Ogisi (2006) study is that the Choices Questionnaire, which was designed to collect ratings of learning agility as perceived by others, was used as a self-report measure. Therefore, given the theoretical foundation of the relationship between cognitive ability and the lack of clear empirical evidence, I hypothesize that:

> *Hypothesis 8a: The learning agility simulation will be positively related to cognitive ability.*
>
> *Hypothesis 8b: The learning agility indicator will be positively related to cognitive ability.*

LEARNING AGILITY AND EARLY CAREER EMPLOYEES

Learning agility has been established as an important factor for executive development and derailment (Goebel, 2013). In fact, much of the research on learning agility has been conducted on senior level and executive employees. Because the bulk of the research has been conducted at senior levels, the relationship between learning agility and success for early-career or part-time employees has received little attention. If learning agility is important in determining success for leaders, do the relationships also hold true for employees early in their careers? One reason for this omission from the

literature may be the limitation imposed by the availability of tools used to assess

learning agility. Proprietary or time consuming instruments are likely used sparingly, and

are reserved for upper level employees who are deemed "worth" the investment.

However, it could be beneficial for employers to identify potential leaders early on and

perhaps even during the selection process. There may also be range restriction in senior-

level employees that may limit the usefulness of assessing for learning agility.

Specifically, senior-level employees may have better learning agility than their more

junior counterparts and thus there may be less variability in their scores.

Additionally, the relationship between learning agility and performance has not

been found to be as strong as the relationship learning agility and potential (discussed

later in this chapter). An important contribution of this study is exploring this relationship

with a sample of early career employees, which has important implications in the use of

learning agility as a selection tool. The relationship between learning agility and

performance is one that has not received much empirical testing with early career

employees; however this study will be completed using primarily early career employees

and will address a notable research gap.

LEARNING AGILITY AND PERFORMANCE

Organizations have long been concerned with choosing the right employees to

improve organizational performance. In fact, Industrial Psychology is founded on the

relationship between predictors and criterion. However, as Cascio and Aguinis (2008)

argued, the current staffing may have reached its ceiling on the ability to predict

performance. Therefore, it is time to start considering new predictors of performance, and

learning agility may be an important factor to consider. Considering the characteristics of learning agility, learning agile individuals possess the willingness and ability to change in today's constantly changing workplace.

Although learning agility is still a relatively new construct, there have already been a number of research studies documenting the relationship between learning agility and job performance (e.g., Bedford, 2012; Connolly, 2001; Lombardo & Eichinger, 2000; London & Maurer, 2004; McCauley, 2001; Van Velsor, Moxley, & Bunker, 2004). For example, McCall and colleagues (1983) found that successful performers were often better at learning from developmental and challenging assignments. Lombardo and Eichinger (2000) found evidence that the Choices Questionnaire predicted performance (r = .55). In a construct validation of the Choices Questionnaire, Connolly (2001) found learning agility was significantly correlated with job performance (r = .37). In a study of 294 individuals in a variety of occupations, Bedford (2012) found that learning agility (rated by supervisors) was significantly correlated with supervisors rating of job performance (r = .78). However, this finding was from a study where supervisors rated both performance and learning agility. The high correlation between learning agility and performance could be the result of, at least in part, to a halo effect, whereas supervisors may be basing ratings on an overall impression of the employee (Cooper, 1981). In a recent study of learning agility using a multi-rater approach with 1,733 employees of a large pharmaceutical company, researchers found that learning agility was significantly correlated with job performance (r = .34; see De Meuse et al., 2012). The following year, the same assessment of learning agility remained significantly correlated with job performance (r = .49), displaying the predictive validity of learning agility across time.

Furthermore, learning agility appears to be a crucial component of job performance across different career levels. In a study of executives, middle managers, and supervisors, Kaiser and Craig (2011) found that learning agility was the only factor that predicted success across all three career levels. However, learning agility was a stronger predictor of success for executives than it was for middle managers and supervisors.

Hypothesis 9: The learning agility simulation will be positively related to job performance.

LEARNING AGILITY AND POTENTIAL

Perhaps the greatest impact of learning agility is the ability to predict employee potential, particularly in new or complex environments. Given this predictive relationship, learning agility has serious implications for employee selection and performance management. Specifically, if researchers can identify the potential to learn, employees could be selected into organizations or marked for advancement early in their careers. To highlight this point, McCauley (2001) believes learning agility should be assessed early on to identify individuals with managerial and executive potential. Lombardo and Eichinger (2004) contend that learning agility is not just a surrogate for a cognitive ability, and its real utility is in identifying individuals for promotion rather than predicting immediate job performance. They propose a three factor consideration framework for identifying possible promotions. First, consider personal characteristics (e.g., intelligence, motivation, personality). Next, consider work-related experiences and different opportunities to which the individual has been exposed. Last, consider an

individual's learning agility, which represents an ability to learn from past experience and the flexibility to adapt moving forward.

One of the keys to being a high potential performer is learning from one's own experience and applying these abilities to excel in new situations. Indeed, potential cannot be detected from a current task at which the individual excels, but in new tasks and situations. In general, highly learning agile individuals are motivated to learn and are attracted to ideas and people in order to constantly learn. As one advances up the career ladder, there are a new set of skills and complexities that must be mastered in order to be successful (Charan, Drotter, & Noel, 2001; Van Velsor & Leslie, 1995). Silzer and Church (2009) reviewed eleven different practitioner models and found that eight involved measurement of some type of learning agility. Kaiser and Craig (2005) found the one skill that appears to remain constant across all jobs and levels is the ability to learn from experience.

Learning agility may be a more objective method to assess potential among employees. In a study of learning agility with 1,733 employees of a large pharmaceutical company, researchers found that learning agility was significantly correlated with potential ($r = .40$; see De Meuse et al., 2012). In an unpublished dissertation, learning agility was highly correlated with a measure of potential ($r = .78$; Bedford, 2012). In a study with police officers, Connolly (2001) found learning agility was significantly correlated with promotability ($r = .40$). In a study of 2,175 managers across three different career levels (supervisors, middle managers and executives), Kaiser and Craig (2005) found that the only factor that led to success across the three levels was learning orientation, which was defined as a combination of ability and adaptability (which is very

similar to learning agility). In a study of expatriates, Spreitzer, McCall and Mahoney (1997) found learning agility was able to predict employees who were rated as having high potential and those who were solid performers but not likely to advance. Therefore, learning agility may not always be important in one's current job, but is crucial for promotion.

Lombardo and Eichinger (2004) concluded that learning agility is important for performance after promotion, however, in their study, this relationship only held for supervisor rated performance (not peer rated performance). The Center for Creative Leadership conducted a series of experiments on executives in which they determined individuals vary greatly in their ability to learn from experience (Mccall, Lombardo & Morrison, 1998).

Learning agility is believed to have a significant influence on performance as individuals advance to more complex and challenging jobs. The research on leader derailment – individuals who were believed to be high potential, were promoted, and went on to fail – is central to literature learning agility (Van Velsor & Leslie, 1995). The derailment research finds that executives that are successful or unsuccessful rank similarly in intelligence and achievements, however the factor that keeps surfacing for those who derail is the inability or unwillingness to change or adapt (Lombardo, Ruderman, & McCauley, 1988; McCall & Lombardo, 1983). Additionally, successful executives admitted mistakes and worked to correct the problems (McCall et al., 1988). Conversely, unsuccessful leaders work to hide mistakes and are defensive about shortcomings. Displaying this point is the title of Goldsmith's (2008) book that refers to success as an executive, "What got you here won't get you there." In their seminal work,

McCall and colleagues (1988) found that one of the most key components in executive derailment was the inability or lack of motivation to learn from experience and adapt. Furthermore, they found that the strengths that got them promoted to a position of greater responsibility often became weaknesses when they were overused or employed in the wrong situations. Conversely, they highlighted the characteristics of successful employees as: 1) willing to take risks, 2) learn from mistakes, and 3) adapt in new environments. Similarly, the work by Goldsmith (2008) highlights that the two biggest factor for derailment are 1) risk aversion, which limits the amount of learning opportunities and 2) defensiveness, which limits the ability to learn from past experience.

Research suggests that individuals who are able to learn from experiences hold greater potential as employees, have better performance and are more likely to receive promotions (Dries, Vantilborgh, & Pepermans, 2010; Lombardo & Eichinger, 2004; Spreitzer et al., 1997). Typically, the most common-methods of identifying high potential employees are: a) the opinions of senior leaders, b) performance appraisal, or c) a talent review process (Church & Rotolo, 2013). The identification of high potential employees is rarely classified using 360 feedback (16%), psychological testing (14%), cognitive testing (9%), assessment centers (7%), or simulations (4%). A study conducted by the American Medical Association (AMA; 2011) found that only 8% of companies used systematic methods for identifying high potential employees.

The findings with regard to learning agility may have implications on redesigning performance management systems. Typically, organizations identify high performers as having high potential, and mark them for future promotions. However, researchers have noted that while most high potentials are high performers, not all high performers have

high potential (e.g., Corporate Leadership Council, 2005). The finding that not all high performers have high potential has prompted researchers to further consider the factors that lead to success. The ability and motivation to learn from experience could be the characteristic that differentiates the high potentials that succeed in a new role from those who fail (McCall, et al., 1988).

A study conducted by Dries, Vantilborgh & Peppermans (2012) found that learning agility was a significant predictor of potential in employees, predicting potential better than job performance. These results were consistent with the finding that 71% of high performers were not high potential, whereas 93% of high potential were high performers (Corporate Leadership Council, 2005). Additionally, the Corporate Leadership Council (2005) estimated that less than 30% of current high performers have the ability to be successful in broader, senior level positions. As mentioned previously, there are very high rates of leader derailment and learning agility could be a key factor in predicting success above and beyond job performance.

> *Hypothesis 10: The learning agility simulation will be positively related to*
> *potential and promotability.*

LEARNING AGILITY AND ORGANIZATIONAL CITIZENSHIP BEHAVIORS

Most of the learning agility research to date has focused on either task performance or potential (e.g., Bedford, 2012; Connolly, 2012; De Meuse et al., 2012; Lombardo & Eichinger 2000, 2002, 2004). However, another realm of performance, extra-role performance or organizational citizenship behaviors (OCBs) has not been addressed to date. Organizational citizenship behaviors are characteristics of employees

that go above and beyond typical job performance. These behaviors encompass activities such as helping other employees, staying late, giving additional effort, and attending non-mandatory meetings and trainings (Podsakoff, MacKenzie, Moorman & Fetter, 1990). Given the characteristics of learning agility there is likely a relationship between learning agility and some OCBs (e.g., civic virtue, or attending non-mandatory meetings). However, to date there has not been a study that has explored the relationship between learning agility and OCBs, therefore I ask the following research question:

Research Question 2: What is the relationship between the learning agility simulation and OCBs (organizational compliance and civic virtue)?

INCREMENTAL VALIDITY OF LEARNING AGILITY

For many years, organizations have successfully used cognitive ability and personality testing to predict performance (e.g., Barrick & Mount, 1991; Schmidt & Hunter, 1998). However, learning agility, though conceptually similar to cognitive abilities, could help prove as an even more effective predictor of performance and potential. For example, Connolly (2001) found that learning agility predicted job performance significantly better than cognitive abilities and concluded that learning agility is a distinct construct that is free of influence from cognitive ability. Tews, Michel and Noe (2011) found that PALS (perceived ability to learn and solve problems) was found to add incremental validity in the prediction of job performance of restaurant managers over general mental abilities (GMA), openness to experience, and goal orientation. Researchers also found a similar relationship for restaurant servers as well. The conceptualization of PALS is very similar to the motivational components of

learning agility, consisting of the confidence in one's ability to be trained, solve

problems, and learn new things.

Similarly, Dries and colleagues (2010) had supervisors rate high potential

employees and found that job performance predicted 67% of high potentials. When

ratings of learning agility were added, job performance and learning agility were together

able to predict the identified high potential employees 78% of the time, and job

performance was no longer a significant predictor once learning agility was added. A

study by Dries, and colleagues (2012) found that learning agility was a significant

predictor of potential in employees, predicting potential better than job performance. In

fact, after adding learning agility in a hierarchical regression analysis, job performance

was no longer a significant indicator of success. Conversely, Bedford (2012) found that

despite the high correlation between learning agility and job performance, a significant

amount of variance was accounted for by other factors and when learning agility was

added to the regression it accounted for only an additional .04% of the variance in job

performance.

> *Hypothesis 11: The learning agility simulation will provide incremental validity*
>
> *in the prediction of performance and potential over cognitive ability.*
>
> *Hypothesis 12: The learning agility simulation will provide incremental validity*
>
> *in the prediction of performance and potential over the Big Five personality*
>
> *variables.*

Preliminary research has found that learning agility may be lacking in group differences, which is a key benefit of using learning agility in leader identification and development. For example, learning agility appears to be unrelated to gender (De Meuse et al., 2008; Lombardo & Eichinger, 2002). Additionally, learning agility appears to have no relationship with age or ethnicity (De Meuse et al., 2008). A study of over 1,000 employees of a large industrial company in South Africa found that learning agility (measured using the Choices questionnaire; Lombardo & Eichinger, 2000) was not significantly related to gender or age (De Meuse et al., 2008). Research using the viaEDGE found that learning agility was not significantly related to gender, age, or ethnicity (De Meuse et al., 2011). Additionally, simulations have also been found to have relatively small subgroup differences (e.g., Cascio & Aguinis, 2005). More research is necessary but learning agility holds potential as a predictor of performance and potential with minimal group differences.

> *Hypothesis 13a: The learning agility simulation will not be significantly related to gender, age or ethnicity.*
>
> *Hypothesis 13b: The learning agility indicator will not be significantly related to gender, age or ethnicity.*

SUMMARY

This dissertation consists of two studies designed to measure both the construct validity (nomological network) and the criterion-related validity (relationship with important work outcomes) of learning agility. The construct of learning agility is

something that is debated in the learning agility literature and the empirical results have

been inconclusive. Although, the research indicates a pretty clear relationship between

learning agility and performance and potential, this relationship is typically studied in

executive populations. This dissertation will seek to extend that relationship in a

population of early career employees.

III. CHAPTER III: METHOD

STUDY ONE

The purpose of study one is to assess the nomological network surrounding learning agility. This is accomplished by employing two different measures of learning agility in conjunction with various personality and cognitive ability measures. Specifically, study one seeks to determine the relationship between learning agility and other related and unrelated constructs.

Participants. Participation in the study was voluntary, confidential, and anonymous. All of the standards set by the Institutional Review Board (IRB) were followed. A copy of the IRB approval form is presented in Appendix A.

Study one included 832 participants. The mean age of participants was 22.04 years. The participants were predominately female (78.1%). The participants were 63.5% Hispanic, 16.4% White/Caucasian, 12.3% African American, 3.2% Asian, and 4.6% other. The majority of the participants were employed (57.7%), of those 25.8% worked full time. The employed participants worked on average of 24.53 hours per week and were employed at their current companies for an average of 9.42 months. Industry and position related demographic information can be found in Table 1.

Table 1. Industry Demographics Study One

Industry	Percentage
Trades/Skilled Labor	2.5%
Education/Academia	13.8%
Management, Professional, and Related	10.0%
Technical	2.1%
Service	24.8%
Health/Medical Care	15.0%
Government	1.9%
Other	29.9%

Job	Percentage
Sales	22.0%
Customer Service	26.4%
Technical	4.4%
Clerical	13.0%
Managerial	4.0%
Training	2.1%
Professional	6.7%
Other	21.5%

Procedure. The data were collected as part of a larger validation study conducted in partnership with a well-known Industrial/Organizational Psychology consulting firm. This study was administered longitudinally, at two different points in time. During time one, participants completed the personality survey as well as the learning agility simulation. During time two, participants completed the cognitive ability measures and

the learning agility indicator. Participants signed up for a time slot on a participant recruiting system. During the assigned time slot an electronic link was emailed to the participants providing access to the assessments. The participants had one week to complete part one. Approximately one week after the first link was sent, a second electronic link was emailed for the participants to access the second half of the study. Participants were first required to acknowledge informed consent in order to begin the survey. Confidentiality and anonymity of the participants was maintained throughout the study by the use of identification numbers.

Towards the beginning of the survey participants were asked to indicate their employment status. Respondents who indicated they worked either full time or part time were given personality questions that were specific to the workplace. Respondents who indicated they were not currently working did not answer the personality questions specific to the workplace. The workplace-specific questions are indicated in the measures section.

Participation in the study was voluntary and participants were made aware that they could stop at any point during the process. Once all of the questionnaires were completed, the measures were scored and the data were entered into SPSS for analysis. A total of 1028 individuals started the survey. Participants were not included if they did not complete the survey. In addition, the survey included ten dummy questions (e.g., please select answer choice never) to ensure participants were accurately reading and responding to each item in the survey. Any participants who responded incorrectly to more than 30% of dummy questions were excluded from further analysis. After screening the data, 823 surveys were deemed suitable for analysis (80%). Of the 823 surveys, 475

respondents completed the workplace specific personality variables (58%). A total of 374 participants completed the second part of the study (45%).

Measures (Time One). During time one, participants completed the learning agility simulation and the different personality measures. Only working participants were given the personality measures that were workplace specific.

Learning Agility Simulation. Learning agility ability was completed by all participants and measured through the use of a proprietary simulation that was designed to objectively measure learning agility. The simulation is designed to measure learning agility ability, or the applied demonstration of learning agile behaviors. This simulation is presented in the form of a scenario where the person has to use information embedded in the simulation to answer various assessments. The simulation consists of three main phases and requires approximately one hour to complete. The simulation is not specific to any particular job and can be used across jobs and industries. The assessment provides three distinct ratings of learning agility: Observing, Connecting, and Assessing. The three different dimensions are characterized by:

- **Observing** measures the ability to store and gather information;
- **Connecting** measures the ability to recognize patterns and changes in patterns;
- **Assessing** measures the willingness to search for and incorporate feedback.

The Observing subscale is comprised of 33 items and the maximum points possible is 53.0. In a sample of 926 individuals (which includes this sample) the split-half reliability was .79. The Connecting subscale is comprised 18 items and the maximum points possible is 141.0. In a sample of 925 individuals (which includes this sample) the split-half reliability was .70. The Assessing subscale is comprised of 12 items and the

maximum points possible is 24.0. In a sample of 923 individuals (which includes this sample) the split-half reliability was .74. Because of the different points possible for the learning agility simulation subscales, the overall learning agility score was calculated using an average of the z-scores of the subscales.

   Goal Orientation. Goal orientation was completed only by the working participants and was measured using the goal orientation scale developed by VandeWalle (1997). The scale consisted of thirteen items that are divided into three subscales: learning goal orientation, proving goal orientation, and avoiding goal orientation. The learning goal orientation scale is comprised of five items. A sample item includes "I am willing to select a challenging work assignment that I can learn a lot from." The proving subscale consists of four items. A sample items includes "I'm concerned with showing that I can perform better than my co-workers." The avoiding subscale consists of four items. A sample item includes "Avoiding a show of low ability is more important to me than learning a new skill." All items were rated on a five-point Likert scale with 1 = strongly disagree and 5 = strongly agree. The learning, proving, and avoiding subscales all had acceptable internal reliabilities in this sample of 475 participants (α = .87, .77 and .82, respectively).

   The Big Five Personality Traits. The fifty-item International Personality Item Pool (IPIP; Goldberg, 1999) is a widely used publically available scale that was used to measure the Big Five personality traits. All participants were administered the IPIP. The IPIP consists of five subscales (agreeableness, openness to experience, emotional stability, conscientiousness and extraversion) with ten items designed to measure each

trait. All items were rated on a five-point Likert scale where 1 = strongly disagree and 5 = strongly agree.

A sample item from the extraversion scale is "Feel comfortable around people". A sample item from the agreeableness subscale is "Make people feel at ease". A sample item from the conscientiousness scale is "Pay attention to details". A sample item from the openness to experience scale is "Have a vivid imagination". A sample item from the emotional stability scale is "Am relaxed most of the time" a sample reverse coded item is "Am easily disturbed". All of the subscales displayed acceptable internal reliability in the sample of 823 participants (α = .83 - .91).

Cognitive Flexibility. Cognitive flexibility was measured using a seventeen-item cognitive flexibility scale that was developed for this study by a team of Industrial/Organizational psychologists. The cognitive flexibility scale was administered to all participants. Participants were first asked "to what extent the following statements describe you?" An example item includes "I am comfortable in rapidly changing environments." An example reversed coded item includes "I don't enjoy intellectual debates." Participants responded using a five-point Likert scale where 1 = to a very small extent and 5 = to a very great extent. This scale displayed acceptable internal reliability in the sample of 823 participants (α = .78).

Openness to Feedback. Openness to feedback was measured using an eight-item scale that was developed for this study by a team of Industrial/Organizational psychologists. The openness to feedback scale was only administered to working participants. An example item includes "How frequently do you ask your co-workers directly for information about your work performance?" Participants rated items using a

five-point Likert scale where 1 = not at all and 5 = very frequently. This scale displayed acceptable internal reliability in the sample of 475 participants (α = .87).

Tolerance for Ambiguity. Tolerance for ambiguity was measured using thirteen items adapted from the Mstat-I scale developed by Mclain (1993). Tolerance for ambiguity was administered to all participants. An example item is "I generally prefer novelty over familiarity." An example of a reverse-coded item is "I try to avoid situations that are ambiguous." Participants rated the items using a five-point Likert scale where 1 = strongly disagree and 5 = strongly agree. This scale displayed acceptable internal reliability in the sample of 823 participants (α = .86).

Motivation to Learn. Motivation to learn was assessed using six items adapted from the motivation to learn scale developed by Noe and Wilk (1993). The motivation to learn scale was only administered to working participants. An example item is "I try to learn as much as I can from training and development opportunities." Items were scored using a five-point Likert scale where 1 = strongly disagree and 5 = strongly agree. This scale displayed acceptable internal reliability in the sample of 475 participants (α = .71).

Demographics. Demographics collected included gender, ethnicity, age, and employment status.

Measures (Time Two). Time two consisted of completing the learning agility indicator and cognitive ability measures.

Learning Agility Indicator. Participants completed the learning agility indicator, a self-report measure of learning agility, during the second part of this study. The assessment required approximately twenty minutes to complete. The learning agility indicator measures three different areas of learning agility. Unlike the learning agility

simulation, the learning agility indicator assesses an individual's preference for learning agility behaviors. Therefore, the learning agility indicator is designed to measure the motivational components of learning agility. The components are characterized by:

- **Exploring** measures the preference toward taking on a variety of opportunities;

- **Imagining** measures the preference toward being creative and innovative;

- **Examining** measures the confidence in ability and taking risks.

The learning agility indicator is composed of three different types of questions: true/false, forced choice, and Likert-type responses. An example of a true/false question is "I am most comfortable when I can figure out how to approach a project myself". An example of the forced choice is "If something has worked for a long time, it's time to consider finding a better way to do it" or "If something has worked for a long time, there's no need to look for a better way to do it." An example of the Likert-type question is "I spend a lot of time thinking about the different ways I could solve a problem" rated on a 4-point scale where 1 = "not at all like me" and 4 = "a lot like me". The Exploring scale consists of twelve items and the maximum points possible is 1200.0. The Imagining scale consists of twelve items and the maximum points possible is 1200.0. The Examining scale consists of five items and the maximum points possible is 500.0. The learning agility indicator overall score was calculated using an average of the z-scores of the three subscales.

Cognitive Ability. Cognitive ability was measured through proprietary commercially developed computer adaptive tests of two different cognitive ability factors (inductive reasoning and verbal reasoning). Inductive reasoning consists of a series of items that measure pattern recognition. Verbal reasoning consists of a series of passages

and related questions following the passages. The score was expressed in terms of a theta and ranged from -2.04 to 2.11 for verbal reasoning and -1.81 to 2.29 for inductive reasoning. The number of questions ranged from 10 to 25 for both assessments. Both measures are highly reliable. The "stopping rule" for the computer adaptive tests is met when the internal consistency reaches a reliability threshold of .80. Both tests are used widely during employee selection.

STUDY TWO

Study two was conducted to determine the relationship between learning agility and employee performance outcomes. Specifically, study two is a criterion-related validation study to determine the validity coefficient of learning agility in the prediction of job performance and potential. The focus of study two is to determine the relationship between learning agility and work performance and potential outcomes.

Participants. Participants included 149 (separate from the original sample of 823) undergraduate students who completed personality items and assessments in exchange for university participation credit (similar to study one). The mean age of participants was 22.64 years and the participants were predominately female (71%). Additionally, the participants were predominately Hispanic (66%). All of participants were employed with 30% of the participants working full time. Participants that were not employed were unable to participate in study two. The majority of the participants (53%) worked between 15 and 25 hours per week. The majority of the participants (57.1%) have spent one year or more at their current job.

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The second part of study two consisted of 89 supervisors who were recruited by the participant. The average age of the supervisors was 34.95 years. The majority of the supervisors were female (60%) and Hispanic (58%). Almost all of the supervisors worked full time (91%) and the most common number of hours worked was 40 to 50 hours. Most of the supervisors had worked at their current job for one year or more (87.6%).

Table 2. Industry Demographics Study Two

Industry	Percentage
Trades/Skilled Labor	4.7%
Education/Academia	7.4%
Management, Professional, and Related	13.4%
Technical	3.4%
Service	28.2%
Health/Medical Care	14.8%
Government	3.4%
Other	24.8%

Job	Percentage
Sales	16.1%
Customer Service	24.2%
Technical	5.4%
Clerical	14.8%
Managerial	8.7%
Training	5.4%
Professional	8.7%
Other	16.8%

Procedures. Similar to study one, this data were collected as part of a larger validation study conducted in partnership with a well-known Industrial/Organizational Psychology consulting firm. Participants signed up for a time slot and during that time slot they were sent an electronic link to access the study. During that time participants took the personality measures, cognitive ability measures, and the learning agility simulation. The participants also provided the name and work email (where applicable)

of their supervisors and were instructed to notify their supervisors that they would be contacted to participate in a brief survey. Part one of this study took approximately two hours to complete.

Approximately one week after the part one was completed, an email was sent to the supervisor's email address that the participant provided in part one, inviting them to participate in a survey. The email contained an electronic link to performance questions regarding the employee that referred them. They were asked to complete the survey and were provided the name of the employee for reference to complete the survey. The supervisor was not provided with any of the scores that were collected during part one. All identifying information was removed from the data after matching responses. The survey took approximately five minutes to complete. After the supervisor completed the survey the student received additional research participation credit. The supervisor received a $5.00 amazon.com gift card in exchange for their participation.

A total of 232 participants started the survey. Participants were not included in analysis if they did not finish the survey. In addition, participants were not included if they did not finish the learning agility simulation. The final sample consisted of a total of 149 participants (64%) and a total of 89 supervisors completed the performance items during part two resulting in 89 paired responses (60%).

Measures (Time One). During time one, participants completed the learning agility simulation, cognitive ability, and the different personality measures

Learning Agility Simulation. Learning agility was measured through the use of a proprietary simulation that was designed to measure learning agility, as described in study one.

Goal Orientation. Goal orientation was measured using the same thirteen-item measure developed by VandeWalle (1997) used in study one. The three subscales of the goal orientation scale all showed acceptable internal consistency, with a reliability rating of $\alpha = .88$ for learning goal orientation, $\alpha = .81$ for proving goal orientation, and $\alpha = .84$ for avoiding goal orientation, in the sample of 149 participants.

The Big Five personality variables. The Big Five personality traits were measured using the same fifty-item International Personality Item Pool (IPIP; Goldberg, 1999) that was used to measure personality during study one. All five subscales displayed acceptable internal consistency in the sample of 149 participants with a reliability of $\alpha = .92$ for extraversion, $\alpha = .83$ for agreeableness, $\alpha = .81$ for conscientiousness, $\alpha = .87$ for emotional stability, and $\alpha = .83$ for openness to experience.

Openness to Feedback. Openness to feedback was measured using the same eight-item scale that was developed for this study by a team of Industrial/Organizational psychologists and used during study one. This scale displayed acceptable internal reliability ($\alpha = .86$) in the sample of 149 participants.

Motivation to Learn. Motivation to learn was assessed using the same six items adapted from the motivation to learn scale developed by Noe and Wilk (1993) that was used during study one. This scale displayed acceptable internal reliability ($\alpha = .72$) in the sample of 149 participants.

Measures (Time Two). During time two, supervisors completed the performance and potential measures.

Task Performance. Task performance was rated by the supervisor during the second part of this study and was measured using the four-item task performance scale

developed by Eisenberger, Armeli, Rexwinkel, Lynch and Rhoades (2001). The items are designed to assess formal requirements of the job. A sample item is "Performs tasks that are expected of him or her". Supervisors were asked to respond to how much they agree with the statements using a five-point Likert scale where 1 = strongly disagree and 5 = strongly agree. This scale displayed acceptable internal reliability (α = .88) in the sample of 89 participants.

Ability to Learn from Experience. Ability to learn from experience was rated by supervisors using a four-item scale. Two items were adapted from Spreitzer, McCall, & Mahoney (1997) and two items were developed for this study by a team of Industrial/Organizational psychologists. A sample item from the adapted scale is "How effective is this person at learning new technical or functional tasks/skills?" A sample of an item created for this study is "How effectively does this person appear to adapt work behaviors based on lessons learned from work experiences?" All items were rated by the supervisor using a five-point Likert scale where 1 = extremely ineffective and 5 = extremely effective. This scale displayed acceptable internal reliability (α = .85) in the sample of 89 participants.

Speed-to-Competence. Speed-to-competence was rated by supervisors using a four-item scale. This scale was developed by a team of Industrial/Organizational psychologists for use in this study to assess how quickly the employee can learn a new skill or task. A sample item from this scale is "This person tends to perform novel tasks or assignments quickly and effectively?" The scale was rated by supervisors using a five-point Likert agreement scale where 1 = strongly disagree and 5 = strongly agree. This scale displayed acceptable internal reliability (α = .89) in the sample of 89 participants.

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Promotability/Potential. Promotoability/potential was measured using a four-item scale. The scale consists of one item adapted from Thacker and Wayne (1995), one item adapted from Harris, Kacmar & Carlsson (2006) and two items developed for this study. The item adapted from Thacker and Wayne (1995) is "I believe that this employee will have a successful career". The item adapted from Harris and colleagues is "If I needed the advice of a subordinate, I would approach this employee". The two items developed for this study are "This person could effectively handle being promoted (moving up a level)" and "I believe this employee has the potential for long-term success as a leader". All items were rated by supervisors according to agreement using a five-point Likert scale where 1 = strongly disagree and 5 = strongly agree. This scale displayed acceptable internal reliability (α = .79) in the sample of 89 participants.

Organizational Compliance. Organizational compliance was measured using the six-item conscientiousness subscale of the Organizational Citizenship Behaviors (OCB) scale developed by Podsakoff and colleagues (1990). A sample item includes "Obeys company rules and regulations even when no one is watching." The items were rated on a five-point agreement scale where 1 = strongly disagree and 5 = strongly agree. This scale displayed an internal reliability of α = .68 in the sample of 89 participants.

Civic Virtue. Civic virtue was measured using the four-item civic virtue subscale of the Organizational Citizenship Behaviors (OCB) scale developed by Podsakof and colleagues (1990). A sample item includes "Attends meetings that are not mandatory, but are considered important." The items were rated on a five-point agreement scale where 1 = strongly disagree and 5 = strongly agree. This scale displayed acceptable internal reliability (α = .82) in the sample of 89 participants.

IV. CHAPTER IV: RESULTS

This chapter begins with an analysis of the sample including the relationship interrelationships among the learning agility variables, the relationships between the Big Five variables and other personality variables, and a comparison of mean scores between study one and study two on the learning agility simulation. Next, this chapter presents an analysis of the hypotheses including the nomological network and incremental validity analyses. Last, this chapter presents supplemental analyses, including the incremental validity of the learning agility simulation over both cognitive ability and the Big Five personality variables, and the incremental validity of the learning agility indicator over cognitive ability in the prediction of the learning agility simulation.

Data were entered into SPSS and analyzed. Means, standard deviations, and correlations were calculated for all variables. Zero order correlations are presented below in Table 3 for study one and Table 4 for study two.

Table 3. Zero Order Correlations between Learning Agility and Personality Variables Study One

	1	2	3	4	5	6	7	8	9	10	11
1 LAS-Overall											
2 LAS-Observing	.76**										
3 LAS-Connecting	.75**	.43**									
4 LAS-Assessing	.64**	.21**	.18**								
5 LAI - Overall	.15**	.07	.06	.20**							
6 LAI-Exploring	.10	.05	.07	.09	.67**						
7 LAI-Imagining	.13*	.07	.04	.18**	.70**	.17**					
8 LAI-Examining	.09	.04	.01	.15**	.74**	.25**	.32**				
9 Learning Goal Orientation	.01	-.02	.00	.03	.38**	.53**	.14*	.15*	(.88)		
10 Proving Goal Orientation	-.09	-.07	-.08	-.04	.17*	.15*	.20**	-.01	.27**	(.78)	
11 Avoiding Goal Orientation	-.10*	-.07	-.06	-.08	-.21**	-.33**	.01	-.14*	-.24**	.26**	(.82)
12 Extraversion	-.05	.01	-.07	-.05	.20**	.27**	.03	.11*	.19**	.08	-.14**
13 Agreeableness	.01	.00	-.00	.03	.19**	.22**	-.01	.19**	.28**	.07	-.19**
14 Conscientiousness	-.07*	-.06	-.08	-.01	.29**	.35**	.14**	.12*	.33**	.08	-.17**
15 Emotional Stability	.01	.04	-.01	-.01	.13*	.26**	-.09	.10	.25**	-.05	-.31**
16 Openness to Experience	.05	.09*	.02	.01	.40**	.48**	.22**	.15**	.44**	.13**	-.23**
17 Cognitive Flexibility	.11**	.12**	.06	.07*	.47**	.50**	.22**	.29**	.45**	.12*	-.28**
18 Openness to Feedback	-.10*	-.05	-.09	-.06	.24**	.13	.17*	.20**	.19**	.37**	.06
19 Tolerance for Ambiguity	.17**	.15**	.12**	.09*	.34**	.45**	.07	.21**	.31**	.01	-.43**
20 Motivation to Learn	.05	.06	.01	.03	.36**	.36**	.16*	.25**	.53**	.17**	-.22**
21 Inductive Reasoning	.38**	.34**	.39**	.11	.08	.06	.06	.05	.01	-.09	-.14*
22 Verbal Reasoning	.44**	.33**	.38**	.24**	.17**	.09	.11	.17**	.09	.02	-.11
Mean	N/A	37.12	87.91	16.16	N/A	829.60	794.56	358.73	4.17	3.60	2.65
SD	N/A	7.24	17.62	2.82	N/A	231.25	221.95	89.88	0.60	0.79	0.85

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Table 3. Zero Order Correlations between Learning Agility and Personality Variables Study One Cont.

	12	13	14	15	16	17	18	19	20	21	22
12 Extraversion	(.92)										
13 Agreeableness	.25**	(.86)									
14 Conscientiousness	.10**	.23**	(.85)								
15 Emotional Stability	.26**	.25**	.21**	(.88)							
16 Openness to Experience	.31**	.29**	.30**	.28**	(.83)						
17 Cognitive Flexibility	.27**	.33**	.19**	.34**	.55**	(.78)					
18 Openness to Feedback	.18**	.14**	.12**	.03	.20**	.17**	(.87)				
19 Tolerance for Ambiguity	.25**	.22**	.18**	.38**	.45**	.60**	.06	(.86)			
20 Motivation to Learn	.20**	.31**	.31**	.24**	.40**	.40**	.26**	.27**	(.71)		
21 Inductive Reasoning	-.10	-.07	-.09	.13*	.05	.10	-.16*	.13*	-.05	NA	
22 Verbal Reasoning	-.05	.01	-.09	.05	.10	.18**	-.06	.12*	.04	.41**	NA
Mean	3.29	4.10	3.66	3.19	3.79	3.49	2.94	3.26	4.08	0.49	0.54
SD	0.79	0.54	0.62	0.72	0.53	0.48	0.76	0.52	0.48	0.63	0.70

Note. $N = 374 – 823$. *$p < .05$ **$p < .01$. LAS = Learning agility simulation, LAI = Learning agility indicator.

Table 4. Zero Order Correlations between Learning Agility and Personality Variables Study Two

	1	2	3	4	5	6	7	8	9	10	11	12
1 LA-Overall	(N/A)											
2 LA-Observing	.71**	(N/A)										
3 LA-Connecting	.74**	.36**	(N/A)									
4 LA-Assessing	.66**	.16	.22**	(N/A)								
5 Learning Goal Orientation	-.06	-.08	-.05	.00	(.88)							
6 Proving Goal Orientation	.01	-.05	-.03	.10	.20*	(.81)						
7 Avoiding Goal Orientation	-.07	-.15	-.03	.04	-.16	.41**	(.84)					
8 Motivation to Learn	-.03	-.06	-.10	.09	.62**	.25**	-.14	(.72)				
9 Openness to Feedback	.03	-.03	.00	.10	.22**	.35**	.25**	.21*	(.86)			
10 Extraversion	-.04	.05	-.03	-.10	.26**	.10	-.14	.20*	.17*	(.92)		
11 Agreeableness	.00	-.04	.02	.01	.31**	.07	-.14	.32**	.17*	.28**	(.83)	
12 Conscientiousness	-.16*	-.08	-.10	-.16	.29**	-.01	-.21*	.43**	-.05	.15	.28**	(.81)
13 Emotional Stability	.02	.04	.09	-.10	.28**	-.01	-.24**	.23**	-.06	.41**	.17*	.35**
14 Openness to Experience	.09	.08	.06	.05	.34**	-.05	-.21*	.37**	.12	.41**	.32**	.32**
15 Verbal Reasoning	.15	.31**	.06	-.08	-.12	-.10	-.23*	.02	-.17	-.07	-.01	-.05
16 Inductive Reasoning	.31**	.37**	.25*	.01	-.12	-.08	-.14	.04	-.16	-.02	.04	.00
17 Task Performance	.12	.13	.08	.04	.06	-.10	-.02	-.04	-.08	-.17	.06	-.02
18 Learning from Experience	.23*	.28**	.15	.06	.08	-.19	-.21*	-.01	-.08	.03	-.03	-.02
19 Speed-to-Competence	.21*	.26**	.10	.08	.12	-.13	-.13	.06	.02	.03	.09	.00
20 Potential/Promotability	-.02	.04	.03	-.11	.06	-.17	-.12	.07	-.17	.01	-.01	.03
21 Organizational Compliance	.19	.15	.23*	.05	.17	-.15	-.18	.06	-.11	-.06	.12	.02
22 Civic Virtue	.16	.15	.22*	-.01	.16	-.18	-.13	.04	.03	-.02	.20	.09
Mean	N/A	34.36	80.16	16.33	4.27	3.65	2.64	4.14	3.03	3.43	4.05	3.79
Standard Deviation	N/A	8.12	19.06	2.73	0.55	0.79	0.89	0.48	0.73	0.74	0.52	0.57

Table 4. Zero Order Correlations between Learning Agility and Personality Variables Study Two Cont.

	13	14	15	16	17	18	19	20	21	22
13 Emotional Stability	(.86)									
14 Openness to Experience	.15	(.83)								
15 Verbal Reasoning	-.10	.07	(N/A)							
16 Inductive Reasoning	.20*	.05	.45**	(N/A)						
17 Task Performance	-.05	-.13	.02	.11	(.88)					
18 Learning from Experience	.05	.03	.23*	.17	.66**	(.85)				
19 Speed-to-Competence	.03	.11	.23*	.14	.60**	.84**	(.89)			
20 Potential/Promotability	.05	.04	.09	.05	.61**	.71**	.69**	(.79)		
21 Organizational Compliance	.04	.07	.05	.15	.60**	.56**	.53**	.57**	(.68)	
22 Civic Virtue	.07	.08	.13	.07	.40**	.60**	.68**	.60**	.55**	(.82)
Mean	3.39	3.90	0.57	0.44	4.67	4.43	4.41	4.51	4.43	4.21
Standard Deviation	0.73	0.53	0.60	0.60	0.44	0.54	0.57	0.57	0.49	0.63

Note. N = 89 – 149. * *p < .05* ** *p < .01*. LAS = Learning agility simulation, LAI = Learning agility indicator.

This section begins with the relationships between the Big Five personality variables and other personality variables. Next, I explore the relationship between the learning agility simulation and the learning agility indicator. Last, I analyze if there is a mean difference between study one and study two on the learning agility simulation.

Relationship between the Big Five and Other Personality Variables. First, I explored the relationship between the Big Five personality variables and the other personality variables. Results of the correlational analyses are presented below in Table 5.

Table 5. Correlation between the Big Five Personality Variables and Other Personality

Variables

	LGO	PGO	AGO	Cognitive Flexibility	Openness to Feedback	Tolerance for Ambiguity	Motivation to Learn
Study 1 – Extraversion	.19**	.08	-.14**	.27**	.18**	.25**	.20**
Study 1 – Agreeableness	.28**	.07	-.19**	.33**	.14**	.22**	.31**
Study 1 - Conscientiousness	.33**	.08	-.17**	.19**	.12**	.18**	.31**
Study 1 – Emotional Stability	.25**	-.05	-.31**	.34**	.03	.38**	.24**
Study 1 – Openness to experience	.44**	.13**	-.23**	.55**	.20**	.45**	.40**
Study 2 – Extraversion	.26**	.10	-.14	N/A	.17*	N/A	.20*
Study 2 – Agreeableness	.31**	.07	-.14	N/A	.17*	N/A	.32**
Study 2 - Conscientiousness	.29**	-.01	-.21*	N/A	-.05	N/A	.43**
Study 2 – Emotional Stability	.28**	-.01	-.24**	N/A	-.06	N/A	.23**
Study 2 – Openness to Experience	.34**	-.05	-.21*	N/A	.12	N/A	.37**

Note. N = 374 – 823 for study 1, N = 149 for study 2. *$p < .05$ **$p < .01$. LGO = Learning goal
orientation, PGO = Proving goal orientation, AGO = Avoiding goal orientation.

As found in Table 5, the Big Five personality variable that had the strongest

relationships with the other personality variables was openness to experience. In study

one, openness to experience displayed the strongest relationship with all of the other

personality variables except avoiding goal orientation. In study two, openness to

experience had the strongest relationship with learning goal orientation. Although the

relationships between openness to experience and the other personality variables were

significant (with the exception of proving goal orientation and openness to feedback in

study two), the correlations between openness to experience and the other personality

variables were not strong enough to indicate that they were measuring the same constructs.

Relationship between the LAS and LAI. Table 6 below displays the correlation between the learning agility simulation and the learning agility indicator score. The results of study one found a significant positive correlation between the overall learning agility simulation and the overall learning agility indicator score ($r = .15$, $p < .01$). Additionally, the overall learning agility simulation was significantly positively related to the learning agility indicator subscale Imagining ($r = .13$, $p < .05$). However, the overall learning agility simulation was not significantly related to the learning agility subscales Exploring ($r = .10$, ns) and Examining ($r = .09$, ns). At the subscale level for the learning agility simulation, Observing was not significantly related to the learning agility indicator score ($r = .07$, ns), or any of the learning agility indicator subscales: Exploring ($r = .05$, ns), Imagining ($r = .07$, ns), Examining ($r = .04$, ns). Similarly, the learning agility simulation subscale Connecting was not significantly related to the learning agility indicator score ($r = .06$, ns), or any of the learning agility indicator subscales: Exploring ($r = .07$, ns), Imagining ($r = .04$, ns), Examining ($r = .01$, ns). However, the learning agility simulation subscale Assessing was significantly related to the learning agility indicator ($r = .20$, $p < .01$), and subscales Imaging ($r = .18$, $p < .01$) and Examining ($r = .15$, $p < .01$), but was not significantly related to Exploring ($r = .09$, ns).

Table 6. Correlation between the LAS and LAI with Subscales in Study One

	1	2	3	4	5	6	7	8
1 LAS - Overall								
2 LAS - Observing	.76**							
3 LAS - Connecting	.75**	.43**						
4 LAS - Assessing	.64**	.21**	.18**					
5 LAI - Overall	.15**	.07	.06	.20**				
6 LAI - Exploring	.10	.05	.07	.09	.67**			
7 LAI - Imagining	.13*	.07	.04	.18**	.70**	.17**		
8 LAI - Examining	.09	.04	.01	.15**	.74**	.25**	.32**	

Note. N = 374-809. *$p < .05$ ** $p < .01$. LAS = Learning agility simulation, LAI = Learning agility indicator.

Comparison of Study One and Study Two. A t-test was performed to determine if there were any differences between study one and study two on the learning agility simulation variables.

There was a significant difference on the learning agility simulation between study one and study two, where participants in study one received a higher score than participants in study two ($t(956) = 3.89, p < .01$). Similar results were found for the learning agility simulation subscales Observing ($t(956) = 4.20, p < .01$) and Connecting ($t(956) = 4.87, p < .01$) . An analysis of the effect sizes revealed that these differences were relatively small ($d = .35, .37,$ and .43, for overall, Observing, and Connecting, respectively), according to Cohen's effect sizes (Cohen, 1992). There was not a significant difference between the two samples on the Assessing subscale ($t(956) = -0.70,$ *ns*).

Because of these small but significantly significant differences, the two samples will be reported separately for the results of hypothesis testing.

This section contains hypothesis testing for the thirteen hypotheses and two research questions. Hypotheses one through eight are concerned with the nomological network of learning agility. Hypotheses nine and ten are concerned with the relationship between learning agility and performance/potential. Hypothesis eleven and twelve are concerned with the incremental validity of learning agility over traditional predictors of performance/potential. Hypothesis thirteen is concerned with group differences on the learning agility simulation and the learning agility indicator. The results are presented below and separated by hypothesis.

Learning Agility and Learning Goal Orientation. Hypothesis 1a stated that the learning agility simulation would be positively related to learning goal orientation.

The results of study one found that the overall scores from the learning agility simulation were not significantly related to learning goal orientation ($r = .01$, ns), as displayed in Table 7. This relationship also held true for the learning goal orientation and the learning agility simulation subscales, Observing ($r = -.02$, ns), Connecting ($r = .00$, ns), and Assessing ($r = .03$, ns).

In study two, similar results were found between the learning agility simulation and learning goal orientation ($r = -.06$, ns), where the learning agility simulation was not significantly related to learning goal orientation. Additionally, the results of study two did not find significant relationships between learning goal orientation and the learning agility simulation subscales, Observing ($r = -.08$, ns), Connecting ($r = -.05$, ns), and Assessing ($r = .00$, ns).

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Table 7. Correlation between Learning Goal Orientation and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Study 1 - Learning Goal Orientation	.01	-.02	.00	.03
Study 2 - Learning Goal Orientation	-.06	-.08	-.05	.00

Note. N = 475 for study 1, N = 149 for study 2. * $p < .05$ ** $p < .01$. LAS = Learning agility simulation.

There was not a significant relationship between the learning agility simulation and learning goal orientation, thus support was not found for hypothesis 1a.

Hypothesis 1b stated that the learning agility indicator would be positively related to learning goal orientation.

As displayed in Table 8 below, the results of study one found the learning agility indicator score was significantly positively related to learning goal orientation ($r = .38$, $p < .01$). A similar relationship was found between learning goal orientation and the learning agility indicator subscales, Exploring ($r = .53$, $p < .01$), Imagining ($r = .14$, $p < .05$), and Examining ($r = .15$, $p < .05$).

Table 8. Correlations between Learning Goal Orientation and the LAI

	LAI	LAI-Exploring	LAI-Imagining	LAI-Examining
Learning Goal Orientation	.38**	.53**	.14*	.15*

Note. N = 374. * $p < .05$ ** $p < .01$. LAI = Learning agility indicator.

Thus, support was found for hypothesis 1b, where there was a significant relationship between the learning agility indicator and learning goal orientation.

Learning Agility and Proving and Avoiding Goal Orientation. Hypothesis 2a stated that the learning agility simulation would be negatively related to proving and avoiding goal orientation.

As found in Table 9 below, the results of study one found that the learning agility simulation was significantly negatively related to avoiding goal orientation (r = -.10, p < *.05*). However, an examination of the relationship with avoiding goal orientation and the learning agility simulation subscales found no significant relationships, Observing (r = -.07, *ns*), Connecting (r = -.06, *ns*) and Assessing (r = -.08, *ns*). Additionally, the results of study one found that the learning agility simulation was not significantly related to proving goal orientation (r = -.09, *ns*). Similar results were found between the subscales of the learning agility simulation and avoiding goal orientation, Observing (r = -.07, *ns*), Connecting (r = -.08, *ns*) and Assessing (r = -.04, *ns*).

The results of study two found that the learning agility simulation was not significantly related to proving goal orientation (r = .01, *ns*) or avoiding goal orientation (r = -.07, *ns*). Similar results were found with proving goal orientation and the learning agility simulation subscales, Observing (r = -.05, *ns*), Connecting (r = -.03, *ns*) and Assessing (r = .10, *ns*), and the relationship between the learning agility simulation and avoiding goal orientation, Observing (r = -.15, *ns*), Connecting (r = -.03, *ns*) and Assessing (r = .03, *ns*).

Table 9. Correlation between Proving and Avoiding Goal Orientation and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Study 1 - Proving Goal Orientation	-.09	-.07	-.08	-.04
Study 1 - Avoiding Goal Orientation	-.10*	-.07	-.06	-.08
Study 2 - Proving Goal Orientation	.01	-.05	-.03	.10
Study 2 - Avoiding Goal Orientation	-.07	-.15	-.03	.04

Note. N = 475 for study 1, N = 149, study 2. * *p < .05 ** p < .01*. LAS = Learning agility simulation.

In summary, there was not a significant relationship found between the learning agility simulation and proving goal orientation. A significant negative relationship was found between the learning agility simulation and avoiding goal orientation for study one. During study two, there was not a significant relationship found between the learning agility simulation and avoiding goal orientation. Thus, hypothesis 2a received partial support.

Hypothesis 2b stated that the learning agility indicator would be negatively related to proving and avoiding goal orientation.

The results of study one found that the learning agility indicator scores was significantly positively related to proving goal orientation ($r = .17$, $p < .05$), and negatively related to avoiding goal orientation ($r = -.21$, $p < .01$), as displayed in Table 10. Similar results were found between the proving goal orientation and the subscales of the learning agility indicator, Exploring ($r = .15$, $p < .05$) and Imagining ($r = .20$, $p < .01$). However, there was not a significant relationship between proving goal orientation and Examining ($r = -.01$, ns). A significant relationship was also found between avoiding goal orientation and two of the learning agility indicator subscales, Exploring ($r = -.33$, $p < .01$), and Imagining ($r = -.14$, $p < .05$). There was not a significant relationship between avoiding goal orientation and Examining ($r = .01$, ns).

Table 10. Correlation between Proving and Avoiding Goal Orientation and the LAI

	LAI	LAI-Exploring	LAI-Imagining	LAI-Examining
Proving Goal Orientation	.17*	.15*	.20**	-.01
Avoiding Goal Orientation	-.21**	-.33**	.01	-.14*

Note. N = 374. *$p < .05$ **$p < .01$. LAI = Learning agility indicator.

Thus, hypothesis 2b received partial support. As hypothesized there was a negative relationship between the learning agility indicator and avoiding goal orientation. However, contrary to hypothesis 2b there was a significant positive relationship between the learning agility indicator and proving goal orientation.

Learning Agility and the Big Five Personality Variables. Hypothesis 3a stated that there would be a positive relationship between the learning agility simulation and openness to experience.

As displayed in Table 11, the results of the study one did not find a significant relationship between learning agility simulation and openness to experience ($r = .05$, *ns*). Similar results were found between openness to experience and two of the learning agility simulation subscales, Connecting ($r = .02$, *ns*) and Assessing ($r = .01$, *ns*). However, the learning agility simulation subscale Observing had a significant positive correlation with openness to experience ($r = .09$, $p < .05$).

The results of study two also found that there was not a significant correlation between the learning agility simulation and openness to experience ($r = .09$, *ns*). Similar results were found between openness to experience and the learning agility simulation subscales, Observing ($r = -.03$, *ns*), Connecting ($r = -.00$, *ns*) and Assessing ($r = .10$, *ns*).

Table 11. Correlation between Openness to Experience and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Study 1 – Openness to Experience	.05	.09*	.02	.01
Study 2 – Openness to Experience	.09	.08	.06	.05

Note. N = 475 for study 1, N = 149, study 2. *$p < .05$ ** $p < .01$*. LAS = Learning agility simulation.

Thus, hypothesis 3a did not receive support, where there was not a significant relationship between the learning agility simulation and openness to experience for either study one or study two.

Hypothesis 3b stated that there would be a positive relationship between the learning agility indicator and openness to experience.

As displayed in Table 12, there was a significant relationship found between learning agility indicator score and openness to experience ($r = .40$, $p < .01$), during study one. Similarly, a significant relationship was found between openness to experience and the learning agility indicator subscales, Exploring ($r = .48$, $p < .01$), Imagining ($r = .22$, $p < .01$) and Examining ($r = .15$, $p < .01$).

Table 12. Correlation between Openness to Experience and the LAI

	LAI	LAI-Exploring	LAI-Imagining	LAI-Examining
Openness to Experience	.40**	.48**	.22**	.15**

Note. N = 374. *$p < .05$ **$p < .01$. *LAI* = Learning agility indicator.

Thus, hypothesis 3b was fully supported. A positive relationship was found between openness to experience and the learning agility indicator and all of the learning agility indicator subscales.

Research question 1a asked "what is the relationship between the learning agility simulation and conscientiousness, agreeableness, extraversion and emotional stability?"

As displayed in Table 13, the results of the study one found there was not a significant relationship between the learning agility simulation and agreeableness ($r = .01$, *ns*), emotional stability ($r = .01$, *ns*), or extraversion ($r = -.05$, *ns*). However, there was a significant negative relationship between the learning agility simulation and

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conscientiousness ($r = -.07$, $p < .05$). Similar relationships were found with the learning agility simulation subscales. There was not a significant relationship between the learning agility simulation subscale Observing and extraversion ($r = .01$, *ns*), agreeableness ($r = .00$, *ns*), conscientiousness ($r = -.06$, *ns*), or emotional stability ($r = .04$, *ns*). There was not a significant relationship found between the learning agility simulation subscale Connecting and extraversion ($r = -.07$, *ns*), agreeableness ($r = .00$, *ns*), or emotional stability ($r = -.01$, *ns*). However, there was a significant negative correlation between Connecting and conscientiousness ($r = -.08$, $p < .05$). Finally, there was not a significant relationship between the learning agility subscale Assessing and conscientiousness ($r = -.01$, *ns*), agreeableness ($r = .03$, *ns*), emotional stability ($r = -.01$, *ns*), or extraversion ($r = -.05$, *ns*).

Additionally, the results of study two found there was not a significant relationship between the learning agility simulation and agreeableness ($r = .01$, *ns*), emotional stability ($r = .01$, *ns*), or extraversion ($r = -.05$, *ns*). However, there was a significant negative correlation between the learning agility simulation and conscientiousness ($r = -.16$, $p < .05$). Similar results were found with the learning agility simulation subscales during study two. There was not a significant relationship found between the learning agility subscale Connecting and extraversion ($r = -.03$, *ns*), agreeableness ($r = .02$, *ns*), conscientiousness ($r = -.10$, *ns*), or emotional stability ($r = .09$, *ns*). There was not a significant relationship between the learning agility subscale Assessing and extraversion ($r = -.10$, *ns*), agreeableness ($r = .01$, *ns*), conscientiousness ($r = -.15$, *ns*), or emotional stability ($r = -.10$, *ns*). Additionally, there was not a significant relationship between the learning agility simulation subscale Observing and extraversion

($r = .05$, *ns*), agreeableness ($r = -.03$, *ns*), conscientiousness ($r = -.08$, *ns*), or emotional stability ($r = .04$, *ns*).

Table 13. Correlation between Extraversion, Agreeableness, Conscientiousness, Emotional Stability and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Study 1 – Extraversion	-.05	.01	-.07	-.05
Study 1 – Agreeableness	.01	.00	-.00	.03
Study 1 - Conscientiousness	-.07*	-.06	-.08*	-.01
Study 1 – Emotional Stability	.01	.04	-.01	-.01
Study 2 – Extraversion	-.04	.05	-.03	-.10
Study 2 – Agreeableness	.00	-.04	.02	.01
Study 2 - Conscientiousness	-.16*	-.08	-.10	-.16*
Study 2 – Emotional Stability	.02	.04	.09	-.10

Note. N = 475 for study 1, N = 149, study 2. *$p < .05$ ** $p < .01$*. LAS = Learning agility simulation.

In summary, the results of study one and two found no relationships between the learning agility simulation and extraversion, agreeableness, or emotional stability. However, there was a significant negative relationship between the learning agility simulation and conscientiousness for both study one and study two.

Research question 1b asked "what is the relationship between the learning agility simulation and conscientiousness, agreeableness, extraversion and emotional stability?"

There was a significant positive relationship found between the learning agility indicator score and conscientiousness ($r = .29$, $p < .01$), agreeableness ($r = .19$, $p < .01$), emotional stability ($r = .13$, $p < .05$), and extraversion ($r = .20$, $p < .01$). Similarly, there was a significant relationship found between the learning agility indicator subscale Exploring and conscientiousness ($r = .35$, $p < .01$), agreeableness ($r = .22$, $p < .01$),

emotional stability ($r = .26$, $p < .01$), and extraversion ($r = .37$, $p < .01$). There was not a significant relationship found between the learning agility indicator subscale Imagining and agreeableness ($r = -.01$, *ns*), emotional stability ($r = -.09$, *ns*), or extraversion ($r = .03$, *ns*). However, there was a significant relationship found between Imagining and conscientiousness ($r = .14$, $p < .01$). Additionally, there was a significant relationship found between the learning agility indicator subscale Examining and extraversion ($r = .11$, $p < .05$), agreeableness ($r = .19$, $p < .01$), and conscientiousness ($r = .12$, $p < .05$). However, there was not a significant relationship found between Examining and emotional stability ($r = .10$, *ns*).

Table 14. Correlation between Extraversion, Agreeableness, Conscientiousness, Emotional Stability and the LAI

	LAI	LAI-Exploring	LAI-Imagining	LAI-Examining
Extraversion	.20**	.27**	.03	.11*
Agreeableness	.19**	.22**	.-.01	.19**
Conscientiousness	.29**	.35**	.14**	.12*
Emotional Stability	.13*	.26**	-.09	.10

Note. N = 374. * *p* < *.05* ** *p* < *.01*. LAI = Learning agility indicator.

In summary, there was a significant positive relationship between the learning agility indicator and extraversion, agreeableness, conscientiousness, and emotional stability.

Learning Agility and Cognitive Flexibility. Hypothesis 4a stated that the learning agility simulation would be positively related to cognitive flexibility.

As displayed in Table 15, the results of the study one found that the learning agility simulation was positively related to cognitive flexibility ($r = .11$, $p < .01$). Similar

results were found with the learning agility simulation subscales where there was a significant relationship between cognitive flexibility and Observing ($r = .12$, $p < .01$), and Assessing ($r = .07$, $p < .05$). However, there was not a significant relationship between cognitive flexibility and Connecting ($r = .06$, ns).

Table 15. Correlation between Cognitive Flexibility and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Cognitive Flexibility	.11**	.12**	.06	.07*

Note. N = 809. * $p < .05$ ** $p < .01$. LAS = Learning agility simulation.

Thus, hypothesis 4a was supported, where the learning agility simulation was positively related to cognitive flexibility. This relationship was also supported at the subscale level for all of the subscales for the learning agility simulation, except for the Connecting subscale.

Hypothesis 4b stated that the learning agility indicator would be positively related to cognitive flexibility.

The results of study one found that the learning agility indicator score was positively related to cognitive flexibility ($r = .47$, $p < .01$), as displayed in Table 16. Similar results were found for the learning agility indicator subscales where there was a significant relationship between cognitive flexibility and Exploring ($r = .50$, $p < .01$), Imagining ($r = .22$, $p < .01$), and Examining ($r = .29$, $p < .01$).

Table 16. Correlation between Cognitive Flexibility and the LAI

	LAI	LAI-Exploring	LAI-Imagining	LAI-Examining
Cognitive Flexibility	.47**	.50**	.22**	.29**

Note. N = 374. * $p < .05$ ** $p < .01$. LAI = Learning agility indicator.

Thus, hypothesis 4b was supported, where the learning agility indicator was positively related to cognitive flexibility. This relationship was also supported for all three of the learning agility indicator subscales.

Learning Agility and Tolerance for Ambiguity. Hypothesis 5a stated that the learning agility simulation would be positively related to tolerance for ambiguity.

The results of the study one found a significant positive relationship between learning agility simulation and tolerance for ambiguity ($r = .17$, $p < .01$), as displayed in Table 17. Similarly, there was a significant relationship found between tolerance for ambiguity and the learning agility simulation subscales, Observing ($r = .15$, $p < .01$), Connecting ($r = .12$, $p < .01$), and Assessing ($r = .09$, $p < .05$).

Table 17. Correlation between Tolerance for Ambiguity and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Tolerance for Ambiguity	.17**	.15**	.12**	.09*

Note. N = 809. *$p < .05$ **$p < .01$. LAS = Learning agility simulation.

Thus, hypothesis 5a was fully supported, where tolerance for ambiguity was significantly positively related to the learning agility simulation and all three of the learning agility simulation subscales.

Hypothesis 5b stated that the learning agility indicator would be positively related to tolerance for ambiguity.

The results of study one found that the learning agility indicator score was significantly positively related to tolerance for ambiguity ($r = .34$, $p < .01$), as displayed in Table 18. Similarly, a significant relationship was found between tolerance for ambiguity and the learning agility indicator subscales, Exploring ($r = .45$, $p < .01$), and

Examining ($r = .21$, $p < .01$). However, there was not a significant relationship found between tolerance for ambiguity and Imagining ($r = .07$, *ns*).

Table 18. Correlation between Tolerance for Ambiguity and the LAI

	LAI	LAI-Exploring	LAI-Imagining	LAI-Examining
Tolerance for Ambiguity	.34**	.45**	.07	.21**

Note. N = 374. * *p < .05* ** *p < .01*. LAI = Learning agility indicator.

Thus, hypothesis 5b received supported where the learning agility indicator was positively related to tolerance for ambiguity. This relationship was also found for the learning agility indicator subscales, except for the Imagining subscale.

Learning Agility and Openness to Feedback. Hypothesis 6a stated that the learning agility simulation would be positively related to openness to feedback.

As displayed in Table 19, the results of the study one found that the learning agility simulation was negatively related to openness to feedback ($r = -.10$, $p < .01$). Similar results were found between openness to feedback and the learning agility simulation subscale Connecting ($r = -.09$, $p < .05$). However, the learning agility simulation subscales, Observing ($r = -.05$, *ns*) and Assessing ($r = -.06$, *ns*) were not significantly related to openness to feedback.

The results of study two found that the learning agility simulation was not significantly related to openness to feedback ($r = .03$, *ns*). Similar results were found between openness to feedback and the learning agility simulation subscales, Observing ($r = -.03$, *ns*), Connecting ($r = .00$, *ns*), and Assessing ($r = .10$, *ns*).

Table 19. Correlations between Openness to Feedback and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Study 1 – Openness to Feedback	-.10*	-.05	-.09*	-.06
Study 2 – Openness to Feedback	.03	-.03	.00	.10

Note. N = 809. *$p < .05$ **$p < .01$*. LAS = Learning agility simulation.

Thus, hypothesis 6a did not receive support. In study one there was a significant negative relationship between the learning agility simulation and openness to feedback. There was no relationship between the learning agility simulation and openness to feedback in study two.

Hypothesis 6b stated that the learning agility indicator would be positively related to openness to feedback.

The results of study one found that the learning agility indicator score had a significant positive relationship with openness to feedback ($r = .24$, $p < .01$), as displayed in Table 20. Additionally, there was a significant relationship between openness to feedback and the learning agility indicator subscales, Imagining ($r = .17$, $p < .05$), and Examining ($r = .20$, $p < .01$). However, there was not a significant relationship found between openness to feedback and the learning agility indicator subscale Exploring ($r = .13$, *ns*).

Table 20. Correlation between Openness to Feedback and the LAI

	LAI	LAI-Exploring	LAI-Imagining	LAI-Examining
Openness to Feedback	.24**	.13	.17*	.20**

Note. N = 374. *$p < .05$ **$p < .01$*. LAI = Learning agility indicator.

Thus, hypothesis 6b was supported, where a significant positive relationship was found between learning agility indicator and openness to feedback. This relationship was also found for the learning agility indicator subscales, except Exploring.

Learning Agility and Motivation to Learn. Hypothesis 7a stated that the learning agility simulation would be significantly related to motivation to learn.

As displayed in Table 21, the results of the study one did not find a significant correlation between learning agility simulation and motivation to learn ($r = .05$, *ns*). Additionally, there was not a significant relationship found between motivation to learn and the learning agility simulation subscales, Observing ($r = .06$, *ns*), Connecting ($r = .01$, *ns*), and Assessing ($r = .03$, *ns*).

Similar results were found during study two where there was not a significant relationship between the learning agility simulation and motivation to learn ($r = -.03$, *ns*). Additionally, there was not a significant relationship between motivation to learn and the learning agility simulation subscales, Observing ($r = -.06$, *ns*), Connecting ($r = -.10$, *ns*), and Assessing ($r = .09$, *ns*).

Table 21. Correlation between Motivation to Learn and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Study 1 – Motivation to Learn	.05	.06	.01	.03
Study 2 – Motivation to Learn	-.03	-.06	-.10	.09

Note. N = 475 for study 1, N = 149, for study 2. * *p < .05* ** *p < .01*. LAS = Learning agility simulation.

Thus, hypothesis 7a did not receive support. There was not a significant relationship found between the learning agility simulation and motivation to learn in either study one or study two.

Hypothesis 7b stated that the learning agility indicator would be significantly related to motivation to learn.

The results of study one found that there was a significant relationship between the learning agility indicator scores and motivation to learn ($r = .36$, $p < .01$), as displayed in Table 22. Similarly, there was a significant relationship between motivation to learn and the learning agility simulation subscales, Exploring ($r = .36$, $p < .01$), Imagining ($r = .16$, $p < .05$), and Examining ($r = .25$, $p < .01$).

Table 22. Correlation between Motivation to Learn and the LAI

	LAI	LAI-Exploring	LAI-Imagining	LAI-Examining
Motivation to Learn	.36**	.36**	.16*	.25**

Note. N = 374. *$p < .05$ **$p < .01$. LAI = Learning agility indicator.

Thus, hypotheses 7b received support, where a positive relationship was found between learning agility indicator and motivation to learn. This relationship was also found between motivation to learn and the learning agility indicator subscales.

Learning Agility and Cognitive Ability. Hypothesis 8a stated that the learning agility simulation would be significantly related to cognitive ability.

As displayed in Table 23, the results of study one found that there was a significant relationship between the learning agility simulation and inductive reasoning ($r = .38$, $p < .01$), and verbal reasoning ($r = .44$, $p < .01$). Similarly, there was a significant relationship found between inductive reasoning and the learning agility simulation subscales, Observing ($r = .34$, $p < .01$), and Connecting ($r = .39$, $p < .01$). However, there was not a significant relationship between inductive reasoning and the learning agility simulation subscale Assessing ($r = .11$, *ns*). There was a significant relationship found

between verbal reasoning and the learning agility simulation subscales, Observing ($r = .33, p < .01$), Connecting ($r = .38, p < .01$), and Assessing ($r = .24, p < .01$).

Additionally, there was a significant relationship between the learning agility simulation and inductive reasoning ($r = .31, p < .01$), during study two. Similar results were found between inductive reasoning and the learning agility simulation subscales, Observing ($r = .37, p < .01$) and Connecting ($r = .25, p < .05$). However, there was not a significant relationship between inductive reasoning and Assessing ($r = .01$, *ns*). There was not a significant relationship between the learning agility simulation and verbal reasoning ($r = .15$, *ns*) during study two. Similar results were found between verbal reasoning and the learning agility subscales, Observing ($r = .06$, *ns*) and Assessing ($r = -.08$, *ns*). However, there was a significant relationship verbal reasoning and the learning agility simulation subscale Observing ($r = .31, p < .01$).

Table 23. Correlation between Cognitive Ability and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Study 1 – Inductive Reasoning	.38**	.34**	.39**	.11
Study 1 – Verbal Reasoning	.44**	.33**	.38**	.24**
Study 2 – Inductive Reasoning	.31**	.37**	.25**	.01
Study 2 – Verbal Reasoning	.15	.31**	.06	-.0

Note. N = 328-355 for study 1, N = 102 for study 2. * *p < .05* ** *p < .01*. LAS = Learning agility simulation, LAI = Learning agility indicator.

Thus, hypothesis 8a received partial support. There was a significant positive relationship between the learning agility simulation and cognitive ability during study one, and a significant relationship between the learning agility simulation and inductive reasoning in study two. However there was not a significant relationship between the learning agility simulation and verbal reasoning during study two.

Hypothesis 8b stated that the learning agility indicator would be significantly related to cognitive ability.

During study one, there was a significant relationship between the learning agility indicator score and verbal reasoning ($r = .17$, $p < .01$), as displayed in Table 24. Similarly there was a significant relationship between verbal reasoning and the learning agility indicator subscale Examining ($r = .17$, $p < .01$). However, there was not a significant relationship between verbal reasoning and the learning agility indicator subscales, Exploring ($r = .09$, *ns*) and Examining ($r = .11$, *ns*). Additionally, there was a not significant relationship found between the learning agility indicator score and inductive reasoning ($r = .08$, *ns*). Similarly, there was not a significant relationship between inductive reasoning and the learning agility indicator subscales, Exploring ($r = .06$, *ns*), Imagining ($r = .06$, *ns*), or Examining ($r = .05$, *ns*).

Table 24. Correlation between Cognitive Ability and the LAI

	LAI	LAI-Exploring	LAI-Imagining	LAI-Examining
Inductive Reasoning	.08	.06	.06	.05
Verbal Reasoning	.17**	.09	.11	.17**

Note. N = 374. *$p < .05$ ** $p < .01$. LAI = Learning agility indicator.

In sum, there was a significant relationship between the learning agility indicator and verbal reasoning. However, there was not a significant relationship between the learning agility indicator and inductive reasoning. Thus, hypothesis 8b received partial support.

Learning Agility and Performance. Hypothesis nine stated that the learning agility simulation would be significantly related to job performance.

As displayed in Table 25, the results of study two found that the learning agility simulation was not significantly related to task performance ($r = .12$, *ns*). Similar results were found between task performance and the learning agility simulation subscales, Observing ($r = .13$, *ns*), Connecting ($r = .08$, *ns*), and Assessing ($r = .04$, *ns*).

Table 25. Correlations between Task Performance and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Task Performance	.12	.13	.08	.04

Note. N = 89. * *p* < *.05* ** *p* < *.01*. LAS = Learning agility simulation.

Thus, hypothesis nine did not receive support. There was not a significant relationship found between the learning agility simulation and task performance.

Learning Agility and Learning/Promotability. Hypothesis ten stated that the learning agility simulation would be significantly related to performance/promotability.

The results of study two found that the learning agility simulation was significantly related to learning from experience ($r = .23$, *p < .05*), and speed-to-competence ($r = .21$, *p < .05*), as displayed in Table 26. However, the learning agility simulation was not significantly related to potential/promotability ($r = -.02$, *ns*).

The learning agility simulation subscale Observing was found to be significantly related to learning from experience ($r = .28$, *p < .01*), and speed-to-competence ($r = .26$, *p < .05*). However, Observing was not significantly related to potential/promotability ($r = -.02$, *ns*). The learning agility simulation subscale Connecting was not significantly related to learning from experience ($r = .15$, *ns*), speed-to-competence ($r = .10$, *ns*), or potential/promotability ($r = .03$, *ns*). The learning agility simulation subscale Assessing

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was not significantly related to learning from experience ($r = .06$, *ns*), speed-to-competence ($r = .08$, *ns*), or potential/promotability ($r = -.11$, *ns*).

Table 26. Correlation between Learning from Experience, Speed-to-Competence and Potential/Promotability and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Learning from Experience	.23*	.28**	.15	.06
Speed-to-Competence	.21*	.21*	.10	.08
Potential/Promotability	-.02	-.02	.03	-.11

Note. N = 89. *$p < .05$ ** $p < .01$. LAS = Learning agility simulation.

Thus, partial support was found for hypothesis ten, where a significant relationship was found between the learning agility simulation and learning from experience and speed-to-competence. However there was not a significant relationship between the learning agility simulation and potential/promotability.

Learning Agility and OCB's. Research question two asked "what is the relationship between the learning agility simulation and OCB's?"

As displayed in Table 27, the results of study two found that the learning agility simulation was not significantly related to organizational compliance ($r = .19$, *ns*), or civic virtue ($r = .16$, *ns*). Similar results were found between organizational compliance and the learning agility simulation subscales, Observing ($r = .15$, *ns*), and Assessing ($r = .05$, *ns*). However, the learning agility subscale Connecting was significantly related to organizational compliance ($r = .23$, $p < .05$). There was not a significant relationship between civic virtue and the learning agility simulation subscales, Observing ($r = .15$, *ns*), and Assessing ($r = -.01$, *ns*). However, the learning agility subscale Connecting was significantly related to civic virtue ($r = .22$, $p < .05$).

Table 27. Correlation between OCB's and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Organizational Compliance	.19	.15	.23*	.05
Civic Virtue	.16	.15	.22*	-.01

Note. N = 89. *$p < .05$ ** $p < .01$. LAS = Learning agility simulation.

Thus, the results of study two did not find a relationship between OCBs (organizational compliance and civic virtue) and the learning agility simulation. However, there was a significant relationship between OCBs and Connecting, one of the learning agility simulation's subscales.

Incremental Validity of Learning Agility. Hypothesis eleven stated that the learning agility simulation would provide incremental validity over cognitive ability.

Hypothesis eleven was tested using a set of hierarchical linear regressions where the cognitive ability variables (inductive and deductive reasoning) were entered during the first step and the learning agility variable simulation was entered during the second step. Incremental validity evidence is found if the change in R^2 is significant from step 1 to step 2.

As displayed in Tables 28 and 29, the learning agility simulation did not provide incremental validity over cognitive ability in the prediction of task performance ($\Delta R^2 = .024$, $F(3,64) = 0.60$, ns), or potential ($\Delta R^2 = .000$, $F(1,73) = 0.01$, ns). However, incremental validity was found for learning agility over cognitive ability in the prediction of learning from experience ($\Delta R^2 = .045$, $F(1, 63) = 3.67$, $p < 05$) and speed-to-competence ($\Delta R^2 = .062$, $F(1, 63) = 5.07$, $p < .05$).

Table 28. Incremental Validity of the Learning Agility Simulation over Cognitive Ability in the Prediction of Task Performance and Learning from Experience

	Task Performance		Learning from Experience	
	Step 1 β	Step 2 B	Step 1 β	Step 2 B
Verbal Reasoning	-.06	-.07	.19	.06
Inductive Reasoning	.14	.11	.06	.00
Learning Agility Simulation	--	.10	--	.23*
R^2	.015	.024	.055	.100*
ΔR^2	--	.009	--	.045*

Note. N = 89. * $p < .05$.

Table 29. Incremental Validity of the Learning Agility Simulation over Cognitive Ability in the Prediction of Speed-to-Competence and Potential/Promotability

	Speed-To-Competence		Potential/Promotability	
	Step 1 β	Step 2 B	Step 1 β	Step 2 B
Verbal Reasoning	.21	.17	.08	.08
Inductive Reasoning	.03	-.05	.01	.01
Learning Agility Simulation	--	.27*	--	.01
R^2	.051	.113*	.007	.008
ΔR^2	--	.062*	--	.000

Note. N = 89. * $p < .05$.

Thus, hypothesis eleven received partial support. The learning agility simulation did not provide incremental validity over cognitive ability in the prediction of task performance, or potential/promotability. However, the learning agility simulation did provide incremental validity over cognitive ability in the prediction of learning from experience and speed-to-competence.

Hypothesis twelve stated that the learning agility simulation would provide incremental validity over the Big Five personality variables.

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Hypothesis twelve was tested using a set of hierarchical linear regressions where the Big Five variables (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience) were entered during the first step and the learning agility simulation was entered during the second step. Incremental validity evidence is found if the change in R^2 is significant from step 1 to step 2.

As displayed in Tables 30 and 31, the learning agility simulation did not provide incremental validity over the Big Five personality variables in the prediction of task performance ($\Delta R^2 = .011$, $F(1,82) = 0.92$, ns), speed-to-competence ($\Delta R^2 = .037$, $F(1, 82) = 3.23$, ns), or potential/promotability ($\Delta R^2 = .001$, $F(1,82) = 0.47$, ns). However, incremental validity was found for learning agility over the Big Five personality variables in the prediction of learning from experience ($\Delta R^2 = .049$, $F(1, 82) = 4.26$, $p < .05$).

Table 30. Incremental Validity of the Learning Agility Simulation over Big Five Variables in the Prediction of Task Performance and Learning from Experience

	Task Performance		Learning from Experience	
	Step 1 B	Step 2 B	Step 1 β	Step 2 β
Extraversion	-.15	-.13	.00	.04
Agreeableness	.11	.10	-.04	-.06
Conscientiousness	.00	.02	-.05	.00
Emotional Stability	.01	-.01	.07	.02
Openness to Experience	-.10	-.11	.04	.02
Learning Agility Simulation	--	.10	--	.23*
R^2	.044	.055	.007	.056*
ΔR^2	--	.011	--	.049*

Note. N = 89. * $p < .05$.

Table 31. Incremental Validity of the Learning Agility Simulation over Big Five

Variables in the Prediction of Speed-to-Competence and Potential/Promotability

| | Speed-to-Competence | | Potential/ Promotability | |
	Step 1 B	Step 2 B	Step 1 β	Step 2 β
Extraversion	-.04	.00	-.03	-.04
Agreeableness	.07	.06	-.03	-.03
Conscientiousness	-.06	-.02	.01	.01
Emotional Stability	.03	-.02	.06	.06
Openness to Experience	.12	.10	.05	.05
Learning Agility Simulation	--	.20	--	-.03
R^2	.019	.056	.005	.006
ΔR^2	--	.037	--	.001

Note. N = 89. * $p < .05$

Thus, partial support was found for hypothesis twelve. The learning agility

simulation did not provide incremental validity over the Big Five personality variables in

the prediction of task performance, speed-to-competence, or potential/promotability.

However, the learning agility simulation did provide incremental validity over the Big

Five personality variables in the prediction of learning from experience.

Learning Agility and Group Differences. Hypothesis 13a stated that the

learning agility simulation would not be significantly related to gender, age, or ethnicity.

The results of study one found significant differences between male and female

participants for two of the three dimensions of learning agility ability and the overall

score. Specifically, males scored slightly higher than females on the overall learning

agility simulation ($t(806) = 2.33$, $p < .05$), and the Observing ($t(806) = 2.75$, $p < .01$) and

Connecting ($t(806) = 3.38$, $p < .01$) subscales. However, these differences were small

based on Cohen's effect sizes ($d = .20$, .24 and .29, for overall, Observing and

Connecting, respectively; Cohen, 1992). There was not a significant difference on the learning agility simulation subscale Assessing ($t(806) = -1.09$, *ns*).

The results of study two did not find a significant gender difference on the learning agility simulation ($t(147) = 1.54$, *ns*). Similar results were found between gender and the learning agility simulation subscales, Observing ($t(147) = 1.64$, *ns*) and Assessing ($t(147) = -0.58$, *ns*). There was a significant difference found on gender and the learning agility simulation subscale Connecting ($t(147) = 2.26$, *p < .05*) with males scoring slightly higher, however the effect size was relatively small ($d = .41$; Cohen, 1992).

The results of study one found that there were significant differences between white and non-white participants on the learning agility simulation ($t(819) = 2.54$, *p < .05*) with non-white participants scoring slightly higher. Similar results were found between white and non-white participants on the learning agility simulation subscales, Observing ($t(806) = 3.14$, *p < .01*) and Connecting ($t(806) = 2.70$, *p < .01*). However, these differences were based on relatively small effect sizes ($d = .25$, $d = .30$, and $d = .25$, for overall, Observing and Connecting, respectively; Cohen, 1992). There was not a significant difference between white and non-white participants on the learning agility simulation subscale Assessing ($t(806) = 1.47$, *ns*).

The results of study two did not find a significant difference between white and non-white participants on the learning agility simulation ($t(147) = -0.14$, *ns*). Similar results were found with the learning agility simulation subscales, Observing ($t(147) = 1.45$, *ns*), Connecting ($t(147) = -0.48$, *ns*), and Assessing ($t(147) = -1.25$, *ns*).

As displayed in Table 32, the results of study one found a small but significant correlation between learning agility and age ($r = -.10$, *p < .01*). The results were similar

for the learning agility simulation subscales, Observing ($r = -.08$, $p < .05$) and Assessing ($r = -.12$, $p < .01$). There was not a correlation between the Connecting subscale and age ($r = -.02$, *ns*).

Results of study two did not find a significant relationship between age and the learning agility simulation ($r = .11$, *ns*). Similar results were found between age and the learning agility simulation subscales, Observing ($r = .11$, *ns*), Connecting ($r = .03$, *ns*), and Assessing ($r = .10$, *ns*).

Table 32. Correlation between Age and the LAS

	LAS	LAS-Observing	LAS-Connecting	LAS-Assessing
Study 1 - Age	-.10**	-.08*	-.02	-.12*
Study 2 - Age	-.11	-.11	.03	.10

Note. N = 809 for study 1, N = 149 for study 2. *$p < .05$ **$p < .01$. LAS = Learning agility simulation.

Thus, hypothesis 13a received partial support. There was a significant difference found on the learning agility simulation between gender, ethnicity, and age in study one. However, the effect sizes of these differences were small. There was not a significant difference found on the learning agility simulation between gender, ethnicity, and age in study two.

Hypothesis 13b stated that the learning agility indicator would not be significantly related to gender, age or ethnicity.

The results of study one found a significant difference on gender for the learning agility indicator score ($t(372) = 3.54$, $p < .01$), with men scoring higher. Similar results were found for gender on the learning agility indicator subscales, Exploring ($t(372) = 1.98$, $p < .05$), Imagining ($t(372) = 3.40$, $p < .01$), and Examining ($t(372) = 1.96$, $p <$

.05). However, all of the effect sizes were small to moderate, overall (*d* = .45), Exploring (*d* = .27), Imagining (*d* = .50), and Examining (*d* = .25).

The results of study one did not find a significant difference between white and non-white participants on the learning agility indicator score (*t*(371) = 0.35, *ns*). Similar results were found for the learning agility indicator subscales, Exploring (*t*(371) = 0.95, *ns*), Imagining (*t*(371) = -0.81, *ns*), and Examining (*t*(371) = 0.59, *ns*).

The results of study one did not find a significant relationship between the learning agility indicator score and age (*r* = .08, *ns*). Similar results were found between gender and the learning agility indicator subscales, Imagining (*r* = .01, *ns*) and Examining (*r* = .02, ns). However, there was a significant relationship between gender and the Exploring (*r* = .12, *p* < .01) subscale.

Thus, hypothesis 13b received partial support. There was a significant relationship between gender and the learning agility indicator, however these differences were based on relatively small effect sizes. There was not a significant relationship on the learning agility indicator for ethnicity or age.

Differences between the LAS and LAI. A number of differences were found in the nomological network of the learning agility simulation and learning agility indicator. A summary of the differences in the hypothesis testing is found in Table 33.

Overall, the learning agility simulation was found to be significantly negatively related to avoiding goal orientation, and significantly positively related to cognitive flexibility, tolerance for ambiguity and cognitive ability (both inductive and verbal reasoning). There was also a significant negative relationship between the learning agility

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simulation and openness to feedback; however that relationship was contrary to that proposed in the hypothesis.

The learning agility indicator was significantly negatively related to avoiding goal orientation and significantly positively related to learning goal orientation, openness to experience, cognitive flexibility, tolerance for ambiguity, openness to feedback, motivation to learn, and verbal reasoning. There was also a significant positive relationship with proving goal orientation; however that relationship was contrary to hypothesis.

Table 33. Summary of Differences on Hypothesis between the LAS and LAI

Hypothesis	Variable	LAS	LAI
1	Learning Goal Orientation	Not Supported	Supported
2	Proving and Avoiding Goal Orientation	Partially Supported	Partially Supported
3	Openness to Experience	Not Supported	Supported
4	Cognitive Flexibility	Supported	Supported
5	Tolerance for Ambiguity	Supported	Supported
6	Openness to Feedback	Not Supported	Supported
7	Motivation to Learn	Not Supported	Supported
8	Cognitive Ability	Partially Supported	Partially Supported
13	Group Differences	Partially Supported	Partially Supported

Note. LAS = Learning agility simulation, LAI = Learning agility indicator.

In summary there were a number of differences found in the nomological networks of the learning agility simulation and learning agility indicator. There was a significant positive relationship found between both the learning agility simulation and learning agility indicator and both cognitive flexibility and tolerance for ambiguity. In addition, there was a significant negative relationship found between avoiding goal orientation and both the learning agility simulation and the learning agility indicator. There was a significant positive relationship found between the learning agility indicator and learning goal orientation, openness to experience, openness to feedback, and motivation to learn. Those relationships were not significant with the learning agility

simulation. Although both the learning agility simulation and learning agility indicator had significant relationships with cognitive ability, the relationship appeared stronger with the learning agility simulation.

SUPPLEMENTAL ANALYSES

In addition to the hypothesis testing, supplemental analyses were performed on the studies. First, I explore the incremental validity of the learning agility simulation over both cognitive ability and the Big Five personality variables. Last, I look at the incremental validity of the learning agility indicator over cognitive ability in the prediction of the learning agility simulation.

Incremental Validity of Learning Agility over both Cognitive Ability and the Big Five Personality Variables. A supplemental analysis was performed to determine if the learning agility simulation provided incremental validity over both the Big Five personality variables and cognitive ability. This was tested using a set of hierarchical linear regressions where the Big Five variables (extraversion, agreeableness, conscientiousness, emotional stability, openness to experience) and the cognitive ability variables (inductive and deductive reasoning) were entered during the first step and the learning agility simulation variable was entered during the second step.

As displayed in Tables 34 and 35, the learning agility simulation did not provide incremental validity over the Big Five personality variables and cognitive ability variables in the prediction of task performance ($\Delta R^2 = .007$, $F(1,68) = 0.51$, ns), learning from experience ($\Delta R^2 = .049$, $F(1,68) = 3.71$, ns), or potential/promotability ($\Delta R^2 = .000$, $F(1,68) = 0.02$, ns). The learning agility simulation did provide incremental validity over

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the Big Five personality variables and cognitive ability variables in the prediction of

speed-to-competence ($\Delta R^2 = .060$, $F(1,68) = 4.71$, p < .05).

Table 34. Incremental Validity of the Learning Agility Simulation over Big Five and

Cognitive Ability in the Prediction of Task Performance and Learning from Experience

	Task Performance		Learning from Experience	
	Step 1 B	Step 2 B	Step 1 β	Step 2 β
Extraversion	-.10	-.09	.06	.08
Agreeableness	.14	.13	-.02	-.04
Conscientiousness	.05	.06	-.01	.03
Emotional Stability	-.09	-.09	.00	-.02
Openness to experience	-.16	-.16	.03	.02
Verbal Reasoning	-.07	-.08	.19	.16
Inductive Reasoning	.17	.15	.07	.01
Learning Agility Simulation	--	.09	--	.24
R^2	.079	.086	.059	.108
ΔR^2	--	.007	--	.049

Note. N = 89. * *p < .05.*

Table 35. Incremental Validity of the Learning Agility Simulation over Big Five and Cognitive Ability in the Prediction of Speed-to-Competence and Potential/Promotability

	Speed-to-Competence		Potential/Promotability	
	Step 1 B	Step 2 B	Step 1 β	Step 2 β
Extraversion	.00	.03	.01	.01
Agreeableness	.11	.08	-.03	-.03
Conscientiousness	-.05	-.01	.03	.03
Emotional Stability	.01	-.01	.02	.02
Openness to experience	.08	.08	.04	.04
Verbal Reasoning	.20	.16	.08	.08
Inductive Reasoning	.04	-.03	.01	.00
Learning Agility Simulation	--	.27*	--	.02
R^2	.072	.132	.012	.012
ΔR^2	--	.060*	--	.000

Note. N = 89. * $p < .05$.

Incremental Validity of the Learning Agility Indicator over Cognitive Ability in the Prediction of Learning Agility Simulation. A supplemental analysis was performed to determine if the learning agility indicator provided incremental validity over cognitive ability in the prediction of the learning agility simulation. This was tested using a set of hierarchical linear regressions where the cognitive ability variables (inductive reasoning and verbal reasoning) were entered during the first step and the learning agility indicator variable was entered during the second step. The results are displayed in Table 36 through 38.

Table 36. Incremental Validity of the Learning Agility Indicator in the Prediction of the Learning Agility Simulation over Verbal Reasoning

	Learning Agility Simulation	
	Step 1 B	Step 2 β
Verbal Reasoning	.42**	.40**
Learning Agility Indicator	--	.07
R^2	.174**	.179**
ΔR^2	--	.005

Note. N = 89. *p < .05 **p < .01*

Table 37. Incremental Validity of the Learning Agility Indicator in the Prediction of the Learning Agility Simulation over Inductive Reasoning

	Learning Agility Simulation	
	Step 1 B	Step 2 β
Inductive Reasoning	.38**	.37**
Learning Agility Indicator	--	.13*
R^2	.143**	.159**
ΔR^2	--	.016*

Note. N = 89. *p < .05 **p < .01*

Table 38. Incremental Validity of the Learning Agility Indicator in the Prediction of the Learning Agility Simulation over Cognitive Ability

	Learning Agility Simulation	
	Step 1 B	Step 2 β
Verbal Reasoning	.31**	.25**
Inductive Reasoning	.25**	.30**
Learning Agility Indicator	--	.08
R^2	.222**	.229**
ΔR^2	--	.007

Note. N = 89. *p < .05 **p < .01*

The learning agility indicator score did provide incremental validity over inductive reasoning in the prediction of the learning agility simulation ($\Delta R^2 = .016$, $F(1,227) = 4.24$, $p < .05$). However, the learning agility indicator score did not provide incremental validity over verbal reasoning ($\Delta R^2 = .005$, $F(1,246) = 1.58$, ns) or both verbal reasoning and inductive reasoning ($\Delta R^2 = .007$, $F(1,227) = 1.92$, ns).

CONCLUSION

Many of the posited hypotheses received support. First, there was a clear difference in the nomological networks of the learning agility simulation and the learning agility indicator. Next, there was a significant relationship between the learning agility simulation and speed-to-competence and learning from experience. Additionally, the learning agility simulation provided incremental validity over both cognitive ability and the Big Five personality variables. Last, there appeared to be only minor group differences on the learning agility measures.

V. CHAPTER V: DISCUSSION

In this chapter I discuss the results of the hypothesis testing and supplemental analyses. This chapter starts with a discussion about the interrelationships between the learning agility simulation and learning agility indicator. Next I discuss the findings surrounding the relationships with learning agility and individual differences. Third, I discuss the differences in correlates of the learning agility simulation and learning agility indicator. Fourth, I discuss the findings regarding the relationship between learning agility and performance. Fifth, I discuss the findings regarding the group differences found on the two measures of learning agility. Sixth, I discuss the implications of the two studies. Seventh, I discuss the strengths and limitations of the studies. Last, I discuss directions for future research.

LEARNING AGILITY SIMULATION AND LEARNING AGILITY INDICATOR

The results of the study one indicated that although related, the learning agility simulation and learning agility indicator are measuring two distinct constructs. This is evidenced by the weak but significant correlation between the learning agility indicator and the learning agility simulation. The finding that the learning agility simulation and learning agility indicator were only weakly correlated with each other supports the research that suggests that learning agility is comprised of two distinct processes (i.e., cognitive and behavioral, or ability and willingness; DeReu et al., 2012; Lombardo & Eichinger, 2000). This finding is also consistent with self-regulated learning theories contention that self-regulated learning consists of different processes (i.e., cognition, metacognition and motivation; Schraw et al., 2006).

Not surprisingly, the learning agility simulation subscale Assessing, which measures the willingness to search for an incorporate feedback, was the subscale that displayed the strongest relationship with the learning agility indicator. No other learning agility simulation subscale was significantly related to the learning agility indicator. The relationship between the learning agility simulation and learning agility indicator suggests that these are measures of two related but distinguished constructs. There is also a clear pattern of differential relationships in the nomological networks that will be discussed later in this chapter.

LEARNING AGILITY AND INDIVIDUAL DIFFERENCES

The results of this dissertation supported many of the posited hypotheses with regards to the relationship between learning agility and other individual differences. The results of the relationship between learning agility and individual differences are discussed below.

Goal Orientation. Similar to the finding by Connolly (2001), this dissertation did not find a significant relationship between the learning agility simulation and learning goal orientation. This finding is consistent with De Meuse and colleagues' (2010) contention that the ability to learn from job experiences consists of more than just learning goal orientation. However, the learning agility indicator had a moderately strong correlation with learning goal orientation. That finding was expected based on the theoretical overlap between learning goal orientation and the willingness to learn component of learning agility.

Contrary to the hypothesis, proving goal orientation was positively related to the learning agility indicator. This finding is not surprising given proving goal orientation's established relationship with self-regulatory learning behaviors such as feedback seeking and emotional regulation (Brett & VandeWalle 1999; Porath & Bateman, 2006). However, it is also not surprising to see that proving goal orientation is not as strongly correlated as learning goal orientation with the learning agility indicator.

Avoiding goal orientation was negatively related with both the learning agility simulation and the learning agility indicator, as hypothesized. This finding indicates that avoiding goal orientation is not only negatively related to the preferences an individual shows toward learning agile behaviors, but may also be detrimental to an individual's performance on learning agility ability. This finding is consistent with research that shows that avoiding goal orientation is not only negatively correlated with self-regulatory behaviors but also actual performance (Porath & Bateman, 2006). In terms of self-regulation, avoiding goal orientation may be negatively related to cognition and metacognition, in addition to motivation. To support this notion, meta-analytic evidence has found that avoidance goal orientation had the strongest relationship with cognitive ability of the three goal orientations (Payne, Youngcourt, & Beaubien, 2007).

Big Five Personality Variables. Openness to experience was not significantly related to the learning agility simulation, with the exception of the Observing subscale in study one. The learning agility indicator was moderately correlated with openness to experience. The relationship between openness to experience and the learning agility indicator is consistent with previous empirical and theoretical research describing the relationship between openness to experience and learning agile preferences (e.g., DeReu

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et al., 2012; Eichinger & Lombardo, 2000; Major et al., 2006). However, the lack of a relationship between the learning agility simulation and openness to experience may help to explain some of the inconclusive findings (e.g., Connolly, 2001; Dries & Pepperman, 2008). It appears that although openness to experience displays a moderately strong relationship with the preference toward learning agile behaviors, it may not actually relate to learning agility ability.

The only Big Five variable that was related to the learning agility simulation was conscientiousness. Conscientiousness was significantly negatively related to the learning agility simulation in both studies. Given that conscientious individuals tend to be ordered and dutiful, this may counteract the adaptability that is necessary for the ability for learning agility. The opposite finding was found for the learning agility indicator, so it may be that conscientious individuals display a preference toward learning agile behaviors, but do not necessarily possess the ability to demonstrate learning agile behaviors. A meta-analysis by Brown and Sitzman (2011) found that planning (similar to conscientiousness) did not have a significant relationship with self-regulated learning. In addition, a similar relationship was found where multitasking ability was significantly negatively related to conscientiousness (Sanderson, Bruk-Lee, Viswesvaran, Gutierrez, & Kantrowitz, 2016).

Cognitive Flexibility. Cognitive flexibility was positively related to both the learning agility simulation and the learning agility indicator. This finding is important because this dissertation is one of the first empirical studies to demonstrate the relationship between cognitive flexibility and learning agility. This finding is also consistent with Lombardo and Eichinger's (2005) contention that cognitive flexibility is

one of the variables that is most strongly related to learning agility. In fact, the strongest individual difference correlate of the learning agility indicator was cognitive flexibility. The findings of this dissertation indicate that cognitive flexibility is an important precursor for both the preference towards learning agile behaviors and actual learning agility ability. These findings point to the notion that the relationship between cognitive flexibility and adaptability may underlie the relationship between cognitive ability and learning agility (e.g., Hamitaux & Hamitaux, 2012; Martin & Rubin, 1995).

Tolerance for Ambiguity. Tolerance for ambiguity was significantly related to both the learning agility simulation and the learning agility indicator. Similar to cognitive flexibility, tolerance for ambiguity appears to be an important characteristic for both learning agility ability and the preference towards learning agile behaviors. This likely has to do with the need for making good decisions in unclear environments that is associated with learning agility. This relationship is consistent with the Lombardo and Eichinger's (2005) contention that tolerance for ambiguity is the construct that is most related with learning agility. In fact, tolerance for ambiguity has the largest correlation with the learning agility simulation out of all of the personality variables. Although the research between learning agility and tolerance for ambiguity is scant, this finding helps to build the empirical evidence displaying the relationship between learning agility and tolerance for ambiguity.

Openness to Feedback. Openness to feedback was negatively related to the learning agility simulation. This finding is surprising considering that openness to feedback represents the likelihood to accept and incorporate feedback (Smither, London, & Reilly, 2005), a primary component of learning agility. The learning agility indicator

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was found to be positively related to openness to feedback. The difference in findings between the learning agility simulation and the learning agility indicator suggests that being open feedback is important for learning agile behaviors but may actually impair learning agility ability. Considering this was one of the first empirical studies exploring the relationship between openness to feedback, this area requires future exploration.

Motivation to Learn. Motivation to learn was not significantly related to the learning agility simulation. This finding is similar to the finding (in this dissertation) that the learning agility simulation was not significantly related to learning goal orientation. Taken together, the desire to learn does not seem to have an impact on the actual ability to apply that learning appropriately. However, the learning agility indicator was significantly related to motivation to learn. Thus, the motivation to learn appears to have more of an impact on the preference towards learning agile behaviors than the actual behaviors themselves.

Cognitive Ability. The learning agility simulation was moderately correlated with both inductive reasoning and verbal reasoning, as expected. Inductive reasoning tests the ability to make connections and recognize patterns, which is a major component of learning agility (DeReu et al., 2012) and the learning agility simulation. Additionally, the simulation is largely a written assessment and relies on a significant degree of reading comprehension to successfully complete, helping to explain the relationship with verbal reasoning. Given that the learning agility simulation was related to both components of cognitive ability it may be because of an underlying relationship with fluid intelligence. Fluid intelligence is related to cognitive ability but not just one domain, consistent with the finding of this dissertation.

However, the findings of this dissertation indicate that the correlations between the learning agility simulation and both measures of cognitive ability were moderate. This finding would indicate that learning agility is more than just a measure of cognitive ability as previously hypothesized (Connolly, 2001). Although considering the moderate relationship with cognitive ability and the lower likelihood of group differences, learning agility may serve as an adequate proxy for cognitive ability. The learning agility indicator displayed a significant relationship with verbal reasoning but not inductive reasoning. Although cognitive ability may contribute to the preference towards learning agile behaviors, it is not as strongly related as many of the personality factors in this dissertation.

DIFFERENCE BETWEEN THE LAS AND THE LAI

The findings of this dissertation indicate that although the preference towards learning agile behaviors may identify individuals with the propensity to learn, it does not necessarily guarantee that those individuals will have the ability to learn. A clear pattern of differences emerged in this dissertation between the correlates of the learning agility simulation and the learning agility indicator. Specifically, the learning agility indicator significantly related to the motivational aspects of learning agility (e.g., goal orientation, openness to experience, motivation to learn), and the learning agility simulation related more strongly to the cognitive components of personality (i.e., cognitive flexibility and tolerance for ambiguity) and cognitive ability. Researchers found a similar relationship with multitasking ability, in that it was more strongly related to cognitive variables than personality variables (Sanderson et al., 2016).

Another important finding of this dissertation is that the learning agility indicator only provided incremental validity over one area of cognitive ability (inductive reasoning). However, the learning agility indicator did not provide incremental validity over verbal reasoning or inductive and verbal reasoning combined. This finding indicates that the preference, or willingness, to learn is not sufficient to account for learning agility ability. Cognitive ability appears to play a crucial role in predicting whether an individual has the ability to exhibit learning agility.

Differences between the Learning Agility Subscales. A number of differences were found with the correlates of the learning agility simulation subscales. As a reminder, the learning agility simulation consists of three subscales: Observing, Connecting, and Assessing. Observing measures the ability to store and gather information. Connecting measures the ability to recognize patterns and changes in patterns. Assessing measures the ability to objectively evaluate one's own performance.

The Connecting subscale was the subscale most strongly related to inductive and verbal reasoning in study one. That relationship is expected considering that the Connecting subscale consists of pattern recognition. The Connecting subscale was also negatively related to conscientiousness in study one. It may be that the planning and ordering associated with conscientiousness make pattern recognition more difficult. The Observing subscale was the subscale that was most strongly related to learning from experience and speed-to-competence. Individuals that score higher on Observing are performing well on accurately storing and gathering information. This increased ability can be tied back to the self-regulated learning theory cognitive component of learning strategies. Learning strategies are ways that individuals organize information and boost

comprehension and the ability to memorize information (Schraw et al., 2006). Meta-analytic evidence shows a positive relationship between learning strategies and performance (Sitzman & Brown, 2011).

There were also differences found on the correlates of the learning agility indicator subscales. The learning agility indicator consists of three subscales. The Exploring subscale measures the preference toward taking on a variety of opportunities. Imagining measures the preference toward being creative and innovative. Examining measures the confidence in ability and taking risks.

The Exploring subscale showed the strongest relationship of the three learning agility indicator subscales with learning goal orientation, openness to experience, tolerance for ambiguity, cognitive flexibility, and motivation to learn. The Exploring subscale also had the strongest negative relationship of the three subscales with avoiding goal orientation. These relationships can be expected because the Exploring subscale is measuring the desire to take on new opportunities. All of the aforementioned scales (tolerance for ambiguity, cognitive flexibility, and motivation to learn) deal with the willingness to take on new experiences and learning opportunities and/or working effectively in environments that are not well-defined, or in the case of avoiding goal orientation, avoiding such environments.

LEARNING AGILITY AND PERFORMANCE

The results of this study indicate that the relationship between the learning agility simulation and current performance is not as strong as the relationship between the learning agility simulation and the ability for future performance. Specifically, there was

not a significant relationship between the learning agility simulation and task performance, but there was a significant relationship between the learning agility simulation and speed-to-competence and learning from experience. The non-significant relationship between task performance and the learning agility simulation could be due, at least in part, to range restriction in the task performance measure. The task performance measure had the highest mean score and lowest standard deviation of all of the supervisor-rated measures. Range restriction in the criterion variables is a common problem in validation studies. Additionally, there is unreliability that is associated with the measurement of performance. Viswesvaran, Ones, and Schmidt (1996) report a .52 agreement between raters on supervisory measures. Correcting only for the unreliability in the criterion measure would likely double the correlation between the learning agility simulation and task performance resulting in a significant relationship. Surprisingly, there was not a significant relationship between the learning agility simulation and potential/promotability. Overall, the results of this dissertation indicate that the learning agility simulation best predicts how quickly an employee is able to get up-to-speed and learn from previous experience.

Incremental Validity of Learning Agility. The results of this dissertation indicated that learning agility did in fact provide incremental validity over using just traditional predictors of performance (i.e., cognitive ability and personality) for speed-to-competence and learning from experience. Specifically, the learning agility simulation provided incremental validity over cognitive ability in the prediction of both speed-to-competence and learning from experience. The learning agility simulation provided incremental validity over the Big Five personality variables in the prediction of learning

from experience, and the learning agility simulation provided incremental validity over both the Big Five personality variables and cognitive ability in the prediction of speed-to-competence. This relationship is similar to other studies showing the incremental validity of learning agility (e.g., Dries et al., 2012) and has implications for the selection of employees.

LEARNING AGILITY AND GROUP DIFFERENCES

An important consideration for the use of learning agility assessments in selection processes is the likelihood of reduced adverse impact. Learning agility research, and research on simulations, indicate that the adverse impact should be reduced compared to other predictors of performance (e.g., De Meuse et al., 2008; Schmitt, 1996). However, meta-analytic results found a much larger group difference for heavily cognitively loaded assessments than assessments that measured social skills (Roth et al., 2008). Although the results of the current study did find some group differences on the learning agility indicator and the learning agility simulation for ethnicity, they are not as large as differences found on typical cognitive ability assessments, which often range approximately 1 standard deviation across ethnic groups (Schmitt et al., 1996). The group differences is not surprising given that the learning agility simulation is measuring learning agility ability and is heavily cognitively loaded. However, it is promising that these group differences were smaller than those typically found on cognitive measures. The difference found between white and non-white participants were similar, and perhaps even smaller, than those reported in other studies using work samples (Roth et al., 2008; Schmitt et al., 1996). This finding supports Ployhart and Holtz's (2008) assertion that

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simulations may reduce adverse impact. This finding is also consistent with other learning agility literature that suggests that learning agility has limited to no adverse impact (De Meuse et al., 2008).

Study one also found a significant negative correlation with the learning agility simulation and age. This could have two possible explanations. First, older employees may be more resistant to change (Weiss & Maurer, 2004) and the motivation to learn generally decreases over time (Stuart-Hamilton, 2006). Second, older individuals may not be as comfortable with the simulation that was used to assess learning agility. Specifically, older adults show more resistance to technology than younger adults (Morris & Venkatesh, 2000). Additional research is necessary to clarify the relationship between learning agility and age. Theoretically, it would be interesting to see if the negative relationship is a reflection of the negative correlation between age and fluid intelligence. Future studies of learning agility should directly assess fluid intelligence, ease and comfort with technology to tease out the different explanations.

IMPLICATIONS

The results of this dissertation support the idea that there could be two very different components of learning agility (e.g., DeReu et al., 2012). One component is comprised of the ability to learn and apply that learning in new or novel settings, or at its core, learning agility ability. The other component is the willingness portion of learning agility and refers to aspects like pursuing developmental activities, being open minded, and the willingness to experiment. This difference is apparent in the typical definitions of learning agility that refer to willingness and ability (or the similar speed and flexibility;

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DeReu et al., 2012; Eichinger & Lombardo, 2000). Although there may be an overarching construct of learning agility, the finding of this dissertation suggests that it may be beneficial to consider the differences in the two components of learning agility during measurement. Considering the differences in the correlates of the two components, there may also be meaningful differential relationships in the prediction of performance. This finding may also help explain some of the inconclusive research regarding the correlates of learning agility mentioned in Chapter 2, specifically the lack of clear correlates with learning agility that is found in the research.

In addition, this dissertation found that learning agility is an important predictor of both speed-to-competence and learning from experience, and adds incremental validity over traditional predictors. This has implications in the selection of employees that may need to be quickly trained to make an immediate impact. The fact that this was found in an understudied population in learning agility research (early career employees) suggests that learning agility may be an important variable to consider in the selection of early career employees.

STRENGTHS AND LIMITATIONS

A strength of this dissertation was the comprehensive measurement methods, including both objective and subjective assessments of learning agility, objective measures of cognitive ability, self-ratings of personality, and other ratings of performance. The measures were also collected at two different points in time. Due to the inclusion of a multi-method, multi-time research design the findings of these studies are likely less influenced by the impact of common method variance.

There were three primary limitations during study two. The first limitation was that due to time constraints of the study, the learning agility indicator was unable to be included in study two. Because of this exclusion, the relationship between the learning agility indicator and performance could not be explored. This possible relationship is discussed in more detail in the future directions section.

The second limitation was the sample size for supervisor ratings was relatively small. This small sample size may contribute to some of the non-significant findings with the learning agility simulation and supervisor ratings. For example, both measures of organizational citizenship behaviors were approaching significance and may have been significantly related with a larger sample size.

The third limitation was a possible range restriction in the supervisor-rated measures. The mean scores for the supervisor-rated measures were over four (on a five point scale) and had an average standard deviation of approximately 0.5. Range restriction is a typical challenge while conducting validation studies (Schmidt, Shaffer, & Sue-Oh, 2008), and because of this range restriction, there may be nuances in the relationships between learning agility and performance that were not captured in this study. For example, there was not a relationship found between learning agility and the measure of potential/promotabilty, which is contrary to many other studies. This non-significant relationship may have been a result of the lack of variance in the potential/promotability scores. Specifically, if the measure of potential/promotability is not meaningfully discriminating between individuals, then the data collected using this scale will be unable to demonstrate the relationship.

FUTURE DIRECTIONS

One area that needs further exploration is the relationship between the learning agility indicator and performance/potential. There may be a direct relationship between the learning agility indicator and performance, similar to what was found in this dissertation between the learning agility simulation on speed-to-competence and learning from experience. However, it is likely that the relationship is more complicated. For example, the learning agility indicator may act as a moderator of the relationship between the learning agility simulation and performance, similar to the relationship found between multitasking ability and polychronicity (Sanderson et al., 2013).

This dissertation tested, and found, some group differences on learning agility. However, due to the small sample size of supervisor-rated performance/potential I was unable to explore a possible predictive bias of learning agility. For example, there may be a difference in the slope and intercepts of learning agility and performance for different groups (e.g., male and female). Future research should explore this possible predictive bias.

Although the list of personality variables that were collected in this dissertation were fairly expansive, there are a number of personality variables were not included. For example, there has not been much, if any, research between learning agility and compound workplace traits such as emotional intelligence, core self-evaluations, and proactive personality. Research into these compound workplace traits could help further distinguish learning agility and expand its nomological network.

Researchers should consider cross-cultural differences on learning agility. The learning agility research has been largely conducted in the U.S. This brings about the

question of whether learning agility means the same thing in other cultures. There may also be differential relationships between learning agility and performance across cultures. Thus, cross-cultural research could further define the construct of learning agility and whether it is stable across different cultures.

Additionally, there is an opportunity for researchers to extend the findings of this dissertation with different research designs. Although this dissertation used a multi-time measurement method, a true longitudinal design would be beneficial. Learning agility is supposed to have the most impact on employee performance over time and a longitudinal research design would be able to capture changes in level and performance over time. A longitudinal research design could also capture performance after an employee moves to a more senior level.

Last, a major challenge of the learning agility research is the lack of non-proprietary measures to measure learning agility. Because of this challenge, learning agility research is greatly limited to those with access to one of these proprietary measures. A major contribution to the learning agility field would be the creation of a publicly available learning agility measure. A readily available measure would increase the learning agility research and would ensure consistency in measurement across studies. For example, because of their proprietary nature multiple measures of learning agility are rarely used together, meaning that these measures may be measuring different constructs. A non-proprietary measure may help alleviate some of these concerns by providing a tool that many different researchers could access to provide more consistency across research.

CONCLUSION

  To conclude, this dissertation first explored the nomological network of learning agility, including many variables that had not been study, with a measure of learning agility preference (learning agility indicator) and ability (learning agility simulation). The results of this study indicate the willingness and ability portions of learning agility have meaningfully different nomological networks. Second this dissertation explored the predictive and incremental validity of learning agility in prediction of employee performance and potential. The results of this study indicate that learning agility provides predictive and incremental validity in employee learning in a population of early career employees, showing that learning agility is an important variable for entry-level employees in addition to executives. Additionally, this dissertation used commercially developed measures with multiple forms of measurement and has direct workplace relevance. Future research should build on this dissertation to better understand this important individual difference with great potential for understanding employee productivity with implications in both selection and training a workplace that is constantly changing.

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Appendices

Appendix A

FLORIDA INTERNATIONAL UNIVERSITY	Office of Research Integrity
	Research Compliance, MARC 270

MEMORANDUM

To:	Dr. Chockalingam Viswesvaran
CC:	File
From:	Donna J. Simonovitch, Coordinator, Research Integrity *D.S.*
Date:	October 31, 2014
Protocol Title:	**"Learning agility nomologial network"**

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #:	IRB-14-0319	**IRB Exemption Date:**	10/31/14
TOPAZ Reference #:	103040		

As a requirement of IRB Exemption you are required to:

1) Submit an Event Form and provide immediate notification of:
   - Any additions or changes in the procedures involving human subjects.
   - Every serious or unusual or unanticipated adverse event as well as problems with the rights or welfare of the human subjects.
2) Submit a Project Completion Report Form when the study is finished or discontinued.

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

Appendix B

Office of Research Integrity
Research Compliance, MARC 270

MEMORANDUM

To:	Dr. Chockalingam Viswesvaran
CC:	File
From:	Donna J. Simonovitch, Coordinator, Research Integrity
Date:	October 31, 2014
Protocol Title:	**"Criterion-related validity of learning agility"**

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #:	IRB-14-0320	**IRB Exemption Date:**	10/31/14
TOPAZ Reference #:	103060		

As a requirement of IRB Exemption you are required to:

1) Submit an Event Form and provide immediate notification of:
   - Any additions or changes in the procedures involving human subjects.
   - Every serious or unusual or unanticipated adverse event as well as problems with the rights or welfare of the human subjects.
2) Submit a Project Completion Report Form when the study is finished or discontinued.

Special   N/A
Conditions:

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

Appendix C

Big Five Personality (Goldstein, 1990)

Extraversion

1. Am the life of the party

2. Feel comfortable around people

3. Start conversations

4. Talk to a lot of different people at parties

5. Don't mind being the center of attention

6. Don't talk a lot

7. Keep in the background

8. Have little to say

9. Don't like to draw attention to myself

10. Am quiet around strangers

Agreeableness

11. Am interested in people

12. Sympathize with others' feelings

13. Have a soft heart

14. Take time out for others

15. Feel others' emotions

16. Make people feel at ease

17. Am not really interested in others

18. Insult people

19. Am not interested in other people's problems

20. Feel little concern for others

Conscientiousness

21. Am always prepared

22. Pay attention to details

23. Get chores done right away

24. Like order

25. Follow a schedule

26. Am exacting in my work

27. Leave my belongings around

28. Make a mess of things

29. Often forget to put things back in their proper place

30. Shirk my duties

Emotional Stability

31. Am relaxed most of the time

32. Seldom feel blue

33. Get stressed out easily (Reverse coded)

34. Worry about things (Reverse coded)

35. Am easily disturbed (Reverse coded)

36. Get upset easily (Reverse coded)

37. Change my mood a lot (Reverse coded)

38. Have frequent mood swings (Reverse coded)

39. Get irritated easily (Reverse coded)

40. Often feel blue (Reverse coded)

Openness

41. Have a rich vocabulary

42. Have a vivid imagination

43. Have excellent ideas

44. Am quick to understand things

45. Use difficult words

46. Spend time reflecting on things

47. Am full of ideas

48. Have difficulty understanding abstract ideas (Reverse coded)

49. Am not interested in abstract ideas (Reverse coded)

50. Do not have a good imagination (Reverse coded)

Appendix D

Goal Orientation (Vandewalle, 1997)

Learning

1. I am willing to select a challenging work assignment that I can learn a lot from.

2. I often look for opportunities to develop new skills and knowledge.

3. I enjoy challenging and difficult tasks at work where I'll learn new skills.

4. For me, development of my work ability is important enough to take risks.

5. I prefer to work in situations that require a high level of ability and talent

Proving

6. I'm concerned with showing that I can perform better than my co-workers.

7. I try to figure out what it takes to prove my ability to others at work.

8. I enjoy it when others at work are aware of how well I am doing.

9. I prefer to work on projects where I can prove my ability to others.

Avoiding

10. I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.

11. Avoiding a show of low ability is more important to me than learning a new skill.

12. I'm concerned about taking on a task at work if my performance would reveal that I had low ability.

13. I prefer to avoid situations at work where I might perform poorly.

Appendix E

Motivation to learn

1. Try to learn as much as I can from training and development opportunities.

2. Believe I tend to learn more from training and development opportunities than others.

3. Usually motivated to learn skills emphasized in training and development opportunities.

4. Willing to exert effort in training and development opportunities to improve skills.

5. Engaging in training and development opportunities is not a high priority for me.

6. Willing to invest effort to improve job skills and competencies.

Appendix F

Cognitive Flexibility

1. To what extent have you liked playing with theories or abstract ideas?

2. I am comfortable in rapidly changing environments?

3. To what extent have you preferred jobs where the exact approach you were to take was clearly specified?

4. I do well in situations when I didn't know everything I thought I needed to know.

5. To what extent have you enjoyed working with people who offer unusual ideas and suggestions?

6. To what extent have you enjoyed weighing the pluses and minuses of alternative approaches to a problem?

7. To what extent would others say you enjoy trying new ways of doing things?

8. To what extent do you prefer jobs that don't have to be done the same way each time?

9. I tend to solve similar problems in different ways.

10. I think it is vital to consider other perspectives before coming to a conclusion.

11. I don't enjoy intellectual debates.

12. I systematically ask all others involved for their opinions.

13. The best solution to any work problem may differ depending on who you ask.

14. Employees who set aside time for thinking are generally just wasting time.

Appendix G

Tolerance for Ambiguity

1. I don't tolerate ambiguous situations well.

2. I would rather avoid solving a problem that must be viewed from several different perspectives.

3. I try to avoid situations that are ambiguous.

4. I prefer familiar situations to new ones.

5. Problems that cannot be considered from just one point of view are a little threatening.

6. I avoid situations that are too complicated for me to easily understand.

7. I am tolerant of ambiguous situations.

8. I enjoy tackling problems that are complex enough to be ambiguous.

9. I try to avoid problems that don't seem to have only one "best" solution.

10. I generally prefer novelty over familiarity.

11. I dislike ambiguous situations.

12. I find it hard to make a choice when the outcome is uncertain.

13. I prefer a situation in which there is some ambiguity.

Appendix H

Openness to feedback

1. How frequently do you ask your co-workers directly for information about your work performance?

2. How frequently do you ask your supervisor directly for information about your work performance?

3. How frequently do you indirectly seek information about your work performance from coworkers (e.g., by using hinting, joking, asking roundabout questions, etc.)?

4. How frequently do you indirectly seek information about your work performance from you supervisor (e.g., by using hinting, joking, asking roundabout questions, etc.)?

5. How frequently do you pay attention to how your boss acts towards you in order to understand how he/she perceives and evaluates your work performance?

6. How frequently do you pay attention to how your coworkers act towards you in order to understand how they perceive and evaluate your work performance?

7. How frequently do you observe the characteristics of people who are rewarded by your supervisor and use this as feedback on your own performance?

8. How frequently do you observe the performance behaviors your boss rewards and use this as feedback on your own performance?

Appendix I

Task Performance: (Eisenberger, 2001) 1=strongly disagree 5=strongly agree

1. Meets formal performance requirements of the job

2. Fulfills responsibilities specified in job description

3. Performs tasks that are expected of him or her

4. Adequately completes assigned duties

Appendix J

Ability to Learn from Experience (1=Extremely ineffective 5=extremely effective)

1. How effective is this person at learning new technical or functional tasks/skills? (Adapted from Spreitzer, McCall, & Mahoney, 1997)

2. How effective is this person at learning new behavioral skills – that is, new ways of interacting effectively with people in getting the job done? (Adapted from Spreitzer, McCall, & Mahoney, 1997)

3. How effectively does this person appear to make note of lessons learned from work experiences.

4. How effectively does this person appear to adapt work behaviors based on lessons learned from work experiences

Appendix K

Speed-to-Competence (1=strongly disagree 5=strongly agree)

1. This person quickly gets up-to-speed when given new work or a new role on the job?

2. When asked to perform a task for the first time, this person quickly becomes a full-performer?

3. This person tends to perform novel tasks or assignments quickly and effectively?

4. This person performs well when given a new job task or role?

Appendix L

Promotability/Potential (1= strongly disagree 5= strongly agree)

1. This person could effectively handle being promoted (moving up a level)

2. I believe that this employee will have a successful career (Thacker & Wayne, 1995)

3. I believe this employee has the potential for long-term success as a leader

4. If I needed the advice of a subordinate, I would approach this employee (Harris, Kacmar & Carlsson, 2006)

Appendix M

Organizational Compliance (Podsakof & Moorman, 1990) (1 = strongly disagree, 5 = strongly agree)

1. Attendance at work is above the norm.

2. Does not take extra breaks.

3. Obeys company rules and regulations even when no one is watching.

4. Is one of my most conscientiousness employees.

5. Believes in giving an honest day's work for an honest day's pay.

6. Consumes a lot of time complaining about trivial matters. (Reverse scored)

Appendix N

Civic Virtue (Podsakof & Moorman, 1990) (1 = strongly disagree, 5 = strongly agree)

1. Attends meetings that are not mandatory, but are considered important.

2. Attends functions that are not required, but help the company image.

3. Keeps abreast of changes in the organization.

4. Reads and keeps up with organizational announcements, memos, and so on.

VITA

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Born, Palm Beach Gardens, Florida

M.S.   Florida International University, 2010-2013

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PUBLICATIONS AND PRESENTATIONS

Allen, J., Bruk-Lee, V. (2015, May). *Intensity as a moderator between interpersonal conflict and outcomes*. Poster presented at Work, Stress, and Health 2015: Protecting and Promoting Total Worker Health, Atlanta, GA.

Allen, J., Mesmer-Magnus, J., & Viswesvaran, C. (2013, March). *The Impact of dispositional mindfulness on work-related stress and employee burnout: A Meta-Analytic Review*. Poster presented at the Sunshine Education and Research Center Conference, Tampa, FL.

Allen, J., Mesmer-Magnus, J., & Viswesvaran, C. (2014, May). *Personal and professional implications of trait mindfulness: A meta-analytic review*. Poster presented at the 29th annual meeting of the Society for Industrial and Organizational Psychology conference, Honolulu, HI.

Allen, J., Viswesvaran, C., & Bruk-Lee, V. (2014, May). Clarifying learning agility: A construct validation. In N. Moye (Chair), *Exploring learning agility's links with other constructs*. Symposium presented at the 29th annual meeting of the Society for Industrial and Organizational Psychology, Honolulu, HI.

Allen, J., & Wittgenstein, J. P. (2013, May). *The Relationship between prosocial motivation and OCB's moderated by the pressure to produce.* Poster presented at the Association for Psychological Science Annual Convention, Washington D.C.

Allen, J., Wittgenstein, J., & Bruk-Lee, V. (2013, November). Applying the emotion-centered model to abusive supervision: The mediating effects of emotions at work and the moderating effects of social Support. In J. Allen (Chair), *Advances in workplace mistreatment*. Symposium conducted at the annual meeting of the Southern Management Association, New Orleans, LA.

Allen, J., Wittgenstein J., Harari, M., & Bruk-Lee, V. (2012, November). A qualitative review of workplace aggression: Current trends and future directions. In P. Spector (Chair), *Employee responses to workplace abuse*. Symposium presented at the Southern Management Association, Ft. Lauderdale, FL.

Allen, J., Wittgenstein, J., & Harari, M. (2012, March). *Incivility, mobbing, abusive supervision and undermining in the workplace: A qualitative review*. Poster presented at the Sunshine Education and Research Center Conference, Tampa, FL.

Bruk-Lee, V., Nixon, A., Wittgenstein, J., & Allen, J. (2013, May). *Types of conflict at work and psychological strain: A meta-analysis*. Poster presented at Work, Stress, and Health: Protecting and Promoting Total Worker Health, Los Angeles, CA.

Harari, M., Allen, J., & Rudolph, C. (2013, August). *How do dynamic performance characteristics affect performance ratings? The effect of performance trend on ratings occurs through observer attributions, but depends on performance variability*. Paper presented at the 73rd annual meeting of the Academy of Management: Capitalism in Question, Orlando, FL.

Stewart, R., Bruskiewicz, K., Kubisiak, C., Allen, J. (2015, April). Exploring candidate reactions to highly engaging low fidelity assessments. In H. Payne (Chair), *Future of Assessment: Reactions to Innovative Formats and Delivery Modes*. Symposium presented at the 30th annual meeting of the Society for Industrial and Organizational Psychology, Philadelphia, PA.

Wittgenstein, J., & Allen, J. (2013, May). *Bringing conflict home: How workplace conflict can become work-family conflict*. Poster presented at the Association for Psychological Science annual convention, Washington D.C.

Wittgenstein, J., Allen, J., Bruk-Lee, V., & Nixon, A. (2013, May). *Clowns to the left of me, conflict to the right: Stuck with relationship conflict*. Poster presented at Work, Stress, and Health 2013: Protecting and Promoting Total Worker Health, Los Angeles, CA.

Wittgenstein, J., Allen, J., Bruk-Lee, V., & Nixon, A. (2013, May). *What's task conflict got to do with it? A meta-analytic review*. Poster presented at Work, Stress, and Health 2013: Protecting and Promoting Total Worker Health, Los Angeles, CA.

Wittgenstein, J., Harari, M., Allen, J., & Rudolph, C. (2012, November). In Joe J. Eassa Jr (Chair). *When does performance variability matter? The effect of dynamic performance characteristics on rater attributions and performance ratings*. Symposium conducted at the annual meeting of the Southern Management Association, Ft. Lauderdale, FL.