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## Self-direction in Adult Learning: Effect of Locus of Control and Program Design on Learner Motivation and Training Utility

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SELF-DIRECTION IN ADULT LEARNING: EFFECT OF  
LOCUS OF CONTROL AND PROGRAM DESIGN ON  
LEARNER MOTIVATION AND TRAINING UTILITY

A Dissertation

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
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requirements for the degree of  
Doctor of Philosophy

in

The School of Human Resource Education and  
Workforce Development

by

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This dissertation is dedicated to my parents, Robert and Eugene Warner, my brother, Deverson Warner, and my partner in life and marriage, Colin Cannonier.

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## **ABSTRACT**

Andragogy and self-directed learning (SDL) have long been touted as pillars of adult learning theory, but much of the existing SDL research has been predicated on adult learner assumptions that have gone largely untested. This dissertation developed a model based on adult learning and training literatures to assess the antecedents and outcomes of adults' preference for SDL. The model was tested on a sample of 277 adults participating in job-related training through a continuing education program at a university in the southern United States.

Based on social learning theory, locus of control (LOC) was proposed as a predictor of motivation to improve work through learning (MTIWL) and self-directed learning preference (SDLP). Further, it was hypothesized that SDLP would positively influence MTIWL and training utility (UT) based on the expectancy theory premise that more learner control would be beneficial for learner motivation and perceived training utility. Finally, the extent to which andragogical principles were present in course designs was proposed to moderate the relationship between SDLP and MTIWL, and SDLP and TU. Person-environment fit theory suggested that persons would be more motivated to use their training at work and perceive it as more useful if there were congruence between their SDLP and the andragogical design (AD) of a course (i.e., low SDLP and low AD versus high SDLP and high AD).

The study model was tested using structural equation modeling and partially supported the hypothesized relationships. LOC weakly predicted MTIWL, such that persons with an internal LOC reported higher MTIWL, but failed to influence SDLP. SDLP was shown to be a weak predictor of MTIWL but was not shown to be a predictor of TU. AD exhibited weak to

moderate main effects on TU and MTIWL and significantly moderated the relationship between SDLP and TU but not SDLP and MTIWL. Implication of the study and avenues for future research are discussed.

## **CHAPTER 1: INTRODUCTION**

### **Study Rationale**

Andragogy emerged as a dominant method for the instruction of adult learners in the United States in the late 1960s due primarily to the efforts of Malcolm Knowles, who defined it as the “art and science of helping adults learn” (Knowles, 1980, p. 43). Knowles’ andragogy proposed a number of assumptions about adult learners such as their independent self-concept, reservoir of life experiences, learning needs related to life roles, and internal motivation to learn. These assumptions spawned a series of recommendations for designing adult learning experiences to provide learners greater control over learning tasks. The assumptions and recommendations have been widely adopted in practice but under-investigated in the adult learning research.

The debate persists surrounding andragogy’s effectiveness as an instructional method. Anecdotal and descriptive studies of andragogy have dominated the research (Holton, Wilson, & Bates, 2009). Although empirical studies have occurred in ebbs and flows over the past half century, the accumulated evidence has not conclusively demonstrated the validity of Knowles’ assumptions and instruction guidelines. This is due in part to difficulties operationalizing andragogy, varied conceptual interpretations of andragogy, and the use of non-adult samples (Rachal, 2002). Researchers have urged further empirical testing into andragogy to determine its effectiveness as an instructional framework for adult learners (Cross, 1981; Pratt, 1993; Rachal, 2002).

The fundamental premise of andragogy is that adults differ sufficiently from children and adolescents in their nature to warrant a more comprehensive approach to learning

(Knowles & Associates, 1984). According to Knowles (1980), adults desire control over their lives and their learning - they desire self-direction. SDL provides those opportunities for learners to take control of various elements of their learning experience (Reeves, 1993). At about the same time that andragogy was being introduced in North America, SDL emerged as a complementary model (Houle, 1961; Tough, 1967, 1971) that would further define the adult learner concept (Merriam, 2001). SDL is described as a process that gives learners greater responsibility for planning, implementing, and evaluating their learning and closely parallels the instructional processes of andragogy (Brockett & Hiemstra, 1991).

Although early inquiries into SDL date back over 150 years, only in the past three decades has it attracted considerable research attention (Brockett & Hiemstra, 1991). The concerns raised about andragogy are akin to those raised about SDL. Research in both areas has failed to determine clearly their effects on adult learning and is characterized by inadequate theory, use of non-adult samples, a paucity of quantitative studies, and a lack of validated measures (Hiemstra, 1999; Merriam, 2001). Andragogy and SDL remain important parts of the adult education fabric and many questions remain unanswered about the nature of self-directed learners and how situational factors interact with their personality characteristics (Merriam, 2001).

### **Purpose of the Study**

The primary purpose of this study was to extend the understanding of self-directed learning (SDL) in the adult learning context by examining how learner preference for SDL influences motivation to improve work through learning (MTIWL) and perceived training utility (TU). This study further investigated whether training formats that did not support

learner preference for SDL had a negative impact on MTIWL and perceived TU. The purpose of this study was achieved by surveying adult learners who enrolled in short-term, work-related, non-credit courses in a continuing education program at a large public university located in the southern portion of the United States.

### **Research Objectives**

The following objectives were developed to guide this study.

1. Describe the adult learners participating in continuing education courses on the following demographic, work- and course-related variables:
  - a. Age
  - b. Gender
  - c. Highest education level
  - d. Ethnicity
  - e. Employment status
  - f. Sector of employment
  - g. Reason for participating in continuing education course
  - h. Continuing education course in which learners participated
2. Describe the personality of the adult learners participating in continuing education courses in terms of their belief that they can control events in their environment that affect them (i.e., locus of control).
3. Describe the preference that adult learners participating in continuing education courses in this study have for self-directed learning.

4. Describe how motivated adult learners participating in continuing education courses are to use the course content to improve their performance at work.
5. Describe how useful adult learners participating in continuing education courses perceive course content for their job performance.
6. Describe the extent to which adult learners participating in continuing education courses perceive a course was designed to give them greater control over the learning format.
7. Determine if locus of control (LOC), as measured by the Rotter (1966) Internal – External Locus of Control scale, predicts motivation to improve work through learning (MTIWL), as measured by items selected from two Strategic Assessment of Readiness for Training scales (START; Weinstein & Palmer, 1994) and two Learning Transfer System Inventory scales (LTSI; Bates, Holton, & Hatala, 2012), for learners in this study participating in continuing education courses. The subscales of the START are *attitudes toward training* and *motivation to participate in training*. The subscales of the LTSI are *motivation to transfer training* and *performance outcome expectations*.
8. Determine if LOC predicts self-directed learning preference (SDLP), as measured using an adaptation of the self-directed learning scale of the Andragogy in Practice Inventory (API; Bates & Holton, 2010), for learners in this study participating in continuing education courses.
9. Determine if SDLP predicts MTIWL for learners in this study participating in continuing education courses.



10. Determine if SDLP predicts TU for learners in this study participating in continuing education courses.
11. Determine if andragogical design (AD), as measured by scales (i.e., mutual planning scale, diagnosis of learning needs scale, and setting of objectives scale) of the API (Holton, Wilson, & Bates, 2005; Bates & Holton, 2010), moderates the relationship between SDLP and MTIWL for learners in this study participating in continuing education courses.
12. Determine if AD moderates the relationship between SDLP and TU, as measured by items from Morgan and Casper's (2000) evaluation of the dimensions of trainee reactions, for learners in this study participating in continuing education courses.

### **Significance of Study**

This study hopes to address the deficiency in the extant literature by following in the path of a significant research trend that investigates the value of SDL in the workplace (Ravid, 1987). This study considers (1) whether learners' preference for SDL can be explained by the extent to which they relate their success or failure with their own actions and (2) if learners' training-related motivation and perceived training utility are a consequence of their preference for and experience with SDL.

### **Study Contributions**

1. This study adds to the literature investigating the use of SDL in the workplace (Ravid, 1987) by assessing whether SDL motivates adults toward higher learning and performance achievement and improves the perception that training is useful for job performance.

2. This study tries to understand if personality characteristics predispose adult learners to a preference for self-direction in the instructional process (Hiemstra, 1999; Merriam, 2001).
3. This study uses an exclusively adult learner sample and avoids a common pitfall of andragogy research involving the mixing of non-adult and adult learners in samples (Rachal, 2002).
4. This study considers the often-excluded interaction effects of situational factors on learner preferences and perceptions (Merriam, 2001). In examining the effect of learning preference on learner motivation and perceived training utility, the extent to which a course allows learners control over their learning experience is accounted for through the specification of moderated relationships.

## CHAPTER 2: LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

This study investigated the effect of learner preference for self-directed learning (SDL) on motivation to improve work through learning (MTIWL) and perceived training utility (TU). Figure 1 illustrates the research model. The model proposes that individuals differ in the extent to which they believe they can attribute certain events to their actions. Persons who believe they have more control over events will experience a stronger self-directed learning preference (SDLP) and greater MTIWL. SDLP is depicted as positively influencing both MTIWL and TU. Further, the model proposes that when individuals participate in a course format that aligns with their preference for SDL, they will experience greater MTIWL and TU compared to instances where such preferences are not incorporated in a course format. Following this overview is a review of the extant literature and discussion of the study's research hypotheses.

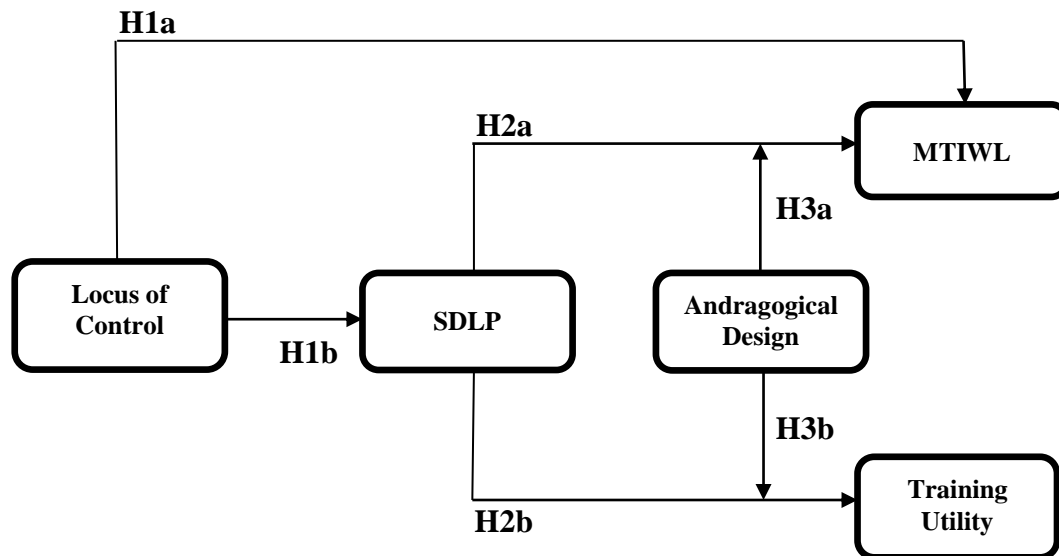


Figure 1: The Study Model.

*Note.* SDLP – self-directed learning preference. MTIWL – motivation to improve work through learning.

## **Motivation to Improve Work through Learning**

Learning is critically important to an organization's ability to be effective at meeting its performance goals and remaining both relevant and competitive. Whether learning occurs internally through formal work-sponsored programs or externally through educational institutions, learners must put their new learning to use before an organization can realize any of its benefits. The purpose of an educational program, therefore, is to plan a learning experience that achieves a permanent change in an individual's knowledge, skills, or attitudes (Noe, 1986), so that job performance can be improved and maintained over time (Holton & Baldwin, 2003). Before job performance can improve, individuals must want to engage in a learning experience for the purpose of enhancing their work performance. Accordingly, motivation precedes any benefit that an individual or organization may derive from learning or training (Goldstein, 1992).

MTIWL refers to “the motivation to improve work outcomes by engaging in training or learning activities and using what is learned to perform job functions differently” (Naquin & Holton, 2003, p. 359). MTIWL is a higher order construct designed to encompass two subordinate constructs: (1) motivation to learn and (2) motivation to transfer. Motivation is a critical part of the training process: It acts as an energizer by creating enthusiasm for the training program; it offers a stimulus by guiding and directing learning; and it provides an impetus to apply and maintain new learning in the workplace (Noe, 1986).

Motivation to learn refers to “a specific desire of the trainee to learn the content of the training program” (Noe, 1986, p. 743). It relates closely to motivation to participate in training, which precedes and influences the motivation to learn new educational content (Beier &

Kanfer, 2010). Motivation to learn is a function of such factors as perceived training utility (Clark, Dobbins, & Ladd, 1993), participation in decisions about training (Schweiger & Leana, 1986), the belief that effort in training will lead to desired performance and outcomes (Mathieu, Tannenbaum, & Salas, 1992; Noe, 1986), and the magnitude of an individual's job involvement (Blau, 1985). Stipek (1996) described a motivated student as one who is actively engaged in the learning process; when learners engage, they approach a challenging task with eagerness and exert the required effort and persistence to solve problems. Research suggests that learners who are motivated to perform well in training are likely to learn and retain more (Smith-Jentsch, Jentsch, Payne, & Salas, 1996) and be more inclined to apply that learning to their job (Mathieu & Martineau, 1997).

Training transfer occurs when learners (1) apply the competencies acquired in an educational setting to different settings, people, and/or situations outside the learning context and (2) maintain behavioral changes over time (Blume, Ford, Baldwin, & Huang, 2010). The effectiveness of training programs is placed in jeopardy when learners are not motivated to use what they learned in training (Mathieu & Martineau, 1997). Motivation to transfer describes a learner's desire to use the knowledge, skills, and attitudes acquired in training on job tasks (Noe, 1986).

Individual and situational factors are important aspects of motivation to transfer. When trainees perceive that their expectations and requirements for training are met, there is a greater possibility for higher post-training motivation (Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991). Course enjoyment and utility also have been shown to positively influence motivation to transfer (Peters, Barbier, Faulx, & Hansez, 2012). Trainees who are motivated to

engage in training and who have the support of people with whom they work (i.e., subordinates, peers, and supervisors) report greater perceived training transfer (Facteau, Dobbins, Russell, Ladd, & Kudisch, 1995). Intentions to transfer training may also be improved when there are accountability measures in place and procedures in the workplace (e.g., performance-based rewards and sanctions) to motivate trainees to use their training (Baldwin & Magjuka, 1991).

Although research efforts have favored the examination of motivation to learn, motivation to transfer is equally important in the use of new competencies and should be a principal goal of training programs (Naquin & Holton, 2003). MTIWL is a potentially powerful motivational construct (Naquin & Holton, 2003); it considers motivation to learn and motivation to transfer training, both of which are key determinants of job performance and training effectiveness.

### **Influence of Locus of Control on Learner Motivation**

Locus of control (LOC) is defined as the “subjective appraisal of factors that account for the occurrence of events and outcomes” (Cheng, Cheung, Chio, & Chan, 2013, p. 152). Rotter (1966) proposed that rewards or reinforcements influence behaviors to the extent that an individual perceives they are contingent upon his/her action or independent of it. Specifically, an internal LOC describes individuals for whom outcomes of events are the result of their own actions, whereas an external LOC describes individuals who interpret the outcomes of events as partly the result of luck, chance, fate, or other factors (Rotter, 1966).

Rotter (1955; 1960) used social learning theory (Bandura, 1977) as a general basis for this argument, proposing that reinforcement helps to strengthen the expectation that a

particular reinforcement will follow an associated action or event in times to come. Once that expectancy develops, failure to provide the reinforcement in the future will weaken the expectancy to the extent that persons believe the reinforcement is contingent on their actions. For example, if employees perceive superior performance in training is contingent on their level of effort during training, achieving high marks on performance assessments will increase the expectancy that strong effort will yield superior performance in the future. Alternatively, if a strong effort in training no longer achieves superior performance, the strong effort – high achievement expectancy will become weaker for persons with an external LOC compared to an internal LOC.

Social learning theory posits that individuals develop a perception of internal control based on repeated cause-effect evaluations and patterns of reinforcement (Bandura, 1977; Cheng et al., 2013). Consequently, individuals cultivate learned general expectancies that are especially relevant in understanding the extent to which they will consistently attribute personal control to particular learning and performance outcomes (Rotter, 1966) and how perceived control will motivate individuals toward goal attainment in an education setting (Deci & Ryan, 2000).

Noe (1986) described LOC as a stable personality trait influencing both individual motivation and ability to learn. Internals (individuals with an internal LOC) exhibit markedly different characteristics than externals (individuals with an external LOC). Figure 2 illustrates some of these distinctions.

*Comparison of Distinctive Features of Externals and Internals*

<b>Internals</b>	<b>Externals</b>
<ul style="list-style-type: none"><li>• tolerate delays in rewards</li><li>• plan for long-term goals</li><li>• are better able to resist coercion</li><li>• are less prone to depression and anxiety</li><li>• are less willing to take risks</li><li>• are more guilt-prone</li><li>• derive greater benefits from social supports</li><li>• are more likely to work for achievements</li><li>• are more likely to prefer games based on skill</li><li>• are better at tolerating ambiguous situations</li><li>• are more willing to resort to remedial work for self-improvement</li><li>• are more likely to do well at distance learning situations</li><li>• after failure, re-evaluate future performances and lower their expectations of success</li><li>• make better mental health recovery in the long-term adjustment to physical disability</li></ul>	<ul style="list-style-type: none"><li>• are more likely to lower their goals</li><li>• have low achievement motivation</li><li>• are prone to learned helplessness</li><li>• prefer games based on chance or luck</li><li>• need more encouragement and guidance from the instructor</li><li>• after failure, may raise their expectations</li></ul>

Figure 2: Internal versus External Locus of Control Comparison.

*Note.* From “The impact of locus of control on language achievement,” by M. Nodoushan, 2012, *International Journal of Language Studies*, 6, p. 125. Copyright 2012 by International Journal of Language Studies.

Internals tend to be resilient and persist through difficulties, which can aid their progress and attainment in training and transfer situations. Internals generally achieve greater academic success (Findley & Cooper, 1983), and internal LOC has been shown to positively relate to self-efficacy (Phillip & Gully, 1997) and motivation to learn (Colquitt, LePine, & Noe, 2000). Internals perceive they have greater control over their environment; consequently, they are more likely to believe they can successfully learn and transfer training content to job tasks and will be motivated to achieve those goals.



Studies indicate that externals may be less resilient and persistent in challenging situations because of their tendency to be stressed and susceptible to depression (Furnham & Steele, 1993), and exhibit passivity and learned helplessness (Rotter, 1992). From this perspective, it is possible that externals would be more likely to believe that training success and performance rewards are generally outside their control and a matter of chance or at the discretion of employers. Thus, externals would be less likely to be motivated to attain learning and transfer goals when challenges in the learning and work environment arise. Accordingly, the following hypothesis is proposed:

Hypothesis 1a: Locus of control (LOC) will influence motivation to improve work through learning (MTIWL) such that individuals with an internal LOC (low LOC score) will have greater MTIWL compared to individuals with an external LOC (high LOC score).

### **Influence of Locus of Control on Self-Directed Learning Preference**

For the purposes of this study, self-directed learning preference (SDLP) describes an individual's greater liking for a learning format that provides the opportunity for self-direction in making, for example, decisions about the format, content, and progression of his/her learning process. The learner with a preference for self-direction perceives that assuming responsibility for key aspects of the educational experience is advantageous for him/her insofar as it enhances learning and performance. SDL describes the process through which learners make critical decisions about what content they will learn and the methods and materials that will aid learning - even when and where learning might take place, as primary responsibility for planning, implementing, and evaluating learning shifts from the teacher to the learner (Hiemstra, 1999). Hiemstra (1994) remarked the following about SDL:

(a) Individual learners can become empowered to take increasingly more responsibility for various decisions associated with the learning endeavor; (b) self-direction is best viewed as a continuum or characteristic that exists to some degree in every person and learning situation; (c) self-direction does not necessarily mean all learning will take place in isolation from others; (d) self-directed learners appear able to transfer learning, in terms of both knowledge and study skill, from one situation to another ... (p. 9).

The definition of SDL has evolved to the point that it now is viewed as reflecting both an instructional method and a personality characteristic. Traditional views of SDL emphasized phases in a learning process (e.g., Knowles, 1975; Moore, 1980; Tough, 1979). One of the more well-known conceptualizations was made by Malcolm Knowles (1975), who defined SDL as a “process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes” (p. 18). Brockett and Hiemstra (1991) chronicled the evolution of SDL thinking and research and found that, as a personality characteristic, SDL has been described as a “psychological or ideal state” (Fellenz, 1985; Kasworm, 1983; Knowles, 1975) or “personal quality or attribute” (Candy, 1988) acquired through personal development. To further clarify the distinctions made in the SDL literature, Brockett and Hiemstra (1991) proposed a new “umbrella concept” termed self-direction in learning to reflect the wider conceptualization of contemporary SDL and capture “both the external characteristics of an instructional process and the internal characteristics of the learner, where the individual assumes primary responsibility for a learning experience” (p. 24).

Self-directed learners are likely to view the SDL process as an important tool for learning when they attribute their learning success to their self-directed behaviors. Knowles

(1980) characterized adult learners as possessing a psychological need for self-direction. As individuals mature, they become generally less dependent on instructors and more self-directing in the learning process. This concept of adult learners stresses the focal role of personality as it relates to self-direction in learning (Brockett & Hiemstra, 1991). Learners with certain personality characteristics may be inclined to prefer taking responsibility for their learning process; this is termed learner self-direction (Brockett & Hiemstra, 1991). Understanding what personality characteristics influence learner self-direction is quite relevant to comprehending why some learners may prefer SDL over others and view the SDL process as an important criterion for learning and job performance.

Individual differences in LOC suggest persons may vary in the degree to which they believe taking responsibility for their learning process positively influences their learning and work performance. For example, in practice, the SDL process asks learners to assume responsibility for functions (e.g., diagnosis of learning needs, selecting learning material, and evaluating learning needs) previously assigned to teachers and which learners may be ill-equipped or unwilling to perform. Knowles (1980) recognized this disparity, noting a person will “move from dependency toward increasing self-directedness, but at different rates for different people and in different dimensions of life” (p. 43).

Internals, being more tolerant of ambiguity and persistent in effort, are more inclined to (1) willingly step into the role of teacher and take responsibility for important learning decisions, (2) react with patience and optimism when challenges arise, and (3) remain committed to the learning process. Using Brockett and Hiemstra’s (1991) learner self-direction concept, persons with a strong internal LOC are more likely to have a high SDLP because they

believe they can take full advantage of the opportunities for improved learning and performance provided in SDL; they view learning achievement in an SDL environment to be contingent on their actions. In comparison, persons with a strong external LOC are more inclined to have a weak SDLP because they believe other factors (e.g., instructor, physical environment, and subject matter) largely influence the extent to which SDL can improve their learning and performance; they view themselves as having little control over their learning achievement in an SDL environment. Possible influences of low achievement motivation and learned helplessness associated with externals may make it difficult for them to believe their actions can have a greater influence on events than other external factors. Therefore:

Hypothesis 1b: Locus of control (LOC) will influence self-directed learning preference (SDLP) such that individuals with an internal LOC (low LOC score) will have a stronger SDLP compared to individuals with an external LOC (high LOC score).

### **Influence of Self-Directed Learning Preference on Learner Motivation & Training Utility**

SDLP is expected to positively influence learners' MTIWL. Based on expectancy theory (Vroom, 1964), individuals are motivated toward behaving in a particular manner based on the desirability of the outcome(s) associated with that behavior. Expectancy theory uses an expectancy x instrumentality x valence framework to explain the belief that effort will lead to a desired level of performance (expectancy) and performance at a certain standard will be rewarded (instrumentality). Ultimately, the reward will be effective at validating the expectancy-instrumentality relationship to the extent that it is desired and valued by the individual (valence).

Under expectancy theory, trainees may have expectations regarding the likelihood that participating in SDL will lead to higher levels of learning and performance. For example, Colquitt and Simmering (1998) were able to demonstrate that learners who placed a greater value on learning-based outcomes showed higher levels of motivation. The strength of these expectancies has been shown to be influenced by personality traits (e.g., locus of control), which affect learner motivation (Rotter, 1966; Noe, 1986). The stronger the expectancy that effort in SDL leads to desired mastery of training content and improved job performance, the more likely a learner is to have greater SDLP and use SDL in a way that is motivating for both learning and training transfer.

SDLP is proposed to positively influence TU. Training utility refers to the “perceived utility value, or usefulness, of training for subsequent job performance” (Alliger, Tannenbaum, Bennett, Traver, & Shotland, 1997, p. 344). From an expectancy perspective, learners are inclined to judge a training program as having utility for job performance when there is an expectancy that taking control of training features, such as setting learning objectives, sequencing learning, and choosing learning resources, leads to greater tailoring of a learning program to meet their particular training needs. A stronger SDLP may reflect learners’ ability to make effective use of the responsibility they are given, which can be enhanced when there is a clear understanding of how training content is to be applied to the job. Accordingly, the following hypotheses are offered:

Hypothesis 2a: Self-directed learning preference (SDLP) will be positively associated with motivation to improve work through learning (MTIWL).

Hypothesis 2b: Self-directed learning preference (SDLP) will be positively associated with training utility (TU).

## Designing the Andragogical Learning Experience

Andragogical design (AD) is an approach to learning that uses the assumptions made about adult learners in andragogy to structure a learning experience in a way that facilitates learning by allowing learners greater control over the learning process. Malcolm Knowles (1980) popularized the concept of andragogy in the United States, originally defining it as the “art and science of helping adults learn” before conceding it to be “simply another model of assumptions about learners” (p. 43). Knowles and Associates (1984) believed andragogy reflected the unique learning needs of adults. He proposed it as an alternative to pedagogy, which described assumptions about teaching children, arguing that pedagogy failed to recognize the changes in learners as they mature into adulthood.

The andragogical model describes the assumptions or principles that characterize the adult learner and provide the basis for andragogical program development:

1. *The need to know.* Adults need to know the reasons for learning something before beginning to learn it.
2. *Learners' self-concept.* Adults view themselves as responsible for their own decisions and their own lives.
3. *The role of the learners' experiences.* Adults possess a greater volume and different quality of life experiences acquired over their lifetime that are a rich resource for learning.
4. *Readiness to learn.* Adults become ready to learn when a need or problem presents itself that requires new learning to address it.

5. *Orientation to learning.* In contrast to the subject-centered orientation of children and adolescents, adults are life-centered (or task-centered or program-centered) in their orientation to learning.
6. *Motivation.* The more potent motivators for adults are internal pressures (e.g., increased job satisfaction, self-esteem, quality of life), although they are responsive to some external motivators (e.g., better jobs, promotions, higher salaries) (Knowles, Holton, & Swanson, 2005).

Knowles and Associates (1984) translated andragogy's assumptions into a SDL process for the design of educational programs. The design assigns the facilitator of learning (a term Knowles preferred to use in place of teacher) the primary role of designing and managing the process and procedures that provide opportunity for learners to be self-directing and a secondary role to act as a content resource for the learner (Knowles & Associates, 1984). The andragogical design process comprises seven elements:

1. *Climate setting.* Facilitators work to establish a climate that is conducive to learning, one in which there is mutual respect and trust and a climate of collaboration, support, openness, authenticity, and enjoyment.
2. *Involving learners in mutual planning.* Facilitators share responsibility for planning the learning experience and create activities or procedures that facilitate learning involvement.
3. *Diagnosis of learning needs:* Facilitators involve participants in diagnosing and negotiating their own needs for learning using strategies such as interest-finding-checklists.

4. *Setting learning objectives:* Facilitators share responsibly for setting the objectives for learning based on diagnosed learning needs.
5. *Designing learning plans:* Facilitators assist learners in identifying resources and developing strategies to use resources to achieve learning objectives.
6. *Implementing learning plans:* Facilitators provide support as learners implement their learning plans.
7. *Evaluating learning needs:* Facilitators involve learners in evaluating the extent to which learners achieve their goals for learning.

Three AD elements have been selected for this study – mutual planning, setting of learning objectives, and diagnosis of learning needs. Of Knowles' seven andragogical design elements, the three selected for this study were chosen because they provide learners good opportunities to exercise some control over the learning process and represent the planning and implementation activities associated with SDL. Together these three design elements represent the AD construct in this study. AD captures important aspects of the SDL process. Learners are empowered under an AD to make key decisions relating to the design of their own learning experience. Therefore, AD promotes learner self-directedness. AD acts as a moderator in this study and its expected influence is discussed next.

### **Andragogical Design as a Moderator**

Congruence between an instructional method and learners' perception of what works best for their learning and performance can have a beneficial effect on learner motivation and course-related satisfaction. Person-environment (P-E) fit theory provides a conceptual framework for explaining the interaction effects of individual and environmental factors and



their influence on attitudes and behaviors (Lewin, 1951; Holland, 1997; Pervin, 1989). P-E fit describes a person's compatibility with his/her environment (Michael, 2009). It is based on the assumption that individuals seek or are attracted to environments they perceive as consistent with their needs, values, or capabilities (Prottas, 2011) and will find such environments satisfying and beneficial to their productivity (Holland, 1997).

P-E fit in educational psychology focuses on the interaction between the learning environment and student characteristics. Murray (1938) proposed a needs-press model in which behavior was viewed as a function of the relationship between an individual and his/her environment. Personal needs indicate the personality characteristics that motivate individuals to achieve particular goals and environmental press represents external environmental factors that have the potential to satisfy or frustrate the expression of those personal needs (Fraser & Rentoul, 1980; Hayes, 1974). It is the complimentary combination of personal needs and environmental press that Stern (1970) theorized would improve academic achievement. Stern's review of the needs-press theory research found academic achievement to be functionally related to both learner characteristics and the learning environment in which learners seek to satisfy particular needs (Welsh, 1971).

In support of P-E fit theory, several studies have reported the beneficial effects of congruence between learners and their learning environment. Rich and Bush (1978) found that matching congruent groups (i.e., the natural direct style of teachers with students high in social-emotional development and the indirect style of teachers to students with low social-emotional development) achieved greater performance on multiple student outcomes, such as achievement and attention to tasks, when compared to incongruent groups. Similarly, Fraser

and Fisher (1983) examined the interaction effects of actual and preferred classroom individualization (i.e., the degree of student interaction with teachers and other class members) on student achievement outcomes. Results supported the P-E fit hypothesis; the relationship between achievement and actual classroom individualization was more positive in classes that contained a level of individualization matching the individualization preferences of students.

Based on the above discussion of P-E fit, SDLP is proposed to interact with AD to influence MTIWL. When individuals have a strong SDLP and experience an educational program that emphasizes an AD, they are more likely to be motivated to learn in training and transfer their new learning to the job. The same would be the case when learners with a weak SDLP are placed in a program with an understated AD that provides few opportunities for SDL. In other words, training participants will be more motivated to learn and transfer that learning when there is congruence between what learners believe about the value of SDL for learning and learning application and what they experience in the training program with respect to those beliefs. Alternatively, a lack of congruence will likely have a negative effect on motivation.

Colquitt et al.'s (2000) meta-analysis on training motivation showed how important motivation is to the acquisition of training content and training transfer. Situational factors in the training environment (e.g., course format, learner control; Brown, 2005) and attitudes toward training (Noe, 1986) have important implications for trainee reactions. In turn, research suggests that trainee reactions strongly predict post-training affective outcomes. A meta-analysis by Sitzmann, Brown, Casper, Ely, and Zimmerman (2008) demonstrated this, finding that training reactions predicted pre-to-post changes in motivation ( $\beta = .51$ ) and self-efficacy ( $\beta$

= .24). Therefore, it is vital to identify and investigate predictors of training motivation (Patrick, Smy, Tombs, & Shelton, 2012).

Positive attitudes toward the SDL process are likely to carry over to a learning program that gives learners control or responsibility over various features of the learning process (Reeves, 1993). Investigations into learner control have produced mixed effects on motivation and trainee reactions. Bell and Kozlowski (2002) note the research has typically been unable to show its motivational advantage. In some cases students favor having some type of opportunity to control the learning process (e.g., Kinzie & Sullivan, 1989) but in others would rather let an external party make key learning decisions (e.g., Lee & Lee, 1991). Kim (2005) investigated changes in motivation levels of students in a SDL format and found that motivation levels waned for those who doubted the benefits of self-directed e-learning. Studies investigating learner control in e-learning environments found positive effects on training satisfaction, learning (Orvis, Fisher, & Wasserman, 2009), and efficiency of training transfer (Corbalan, Kester, & van Merriënboer, 2011). While some research has highlighted the potential benefits of learner control, there are indications that learners are not always able to make the best use of their opportunities for learner control (Steinberg, 1977, 1989; Williams, 1993), which may have a negative influence on their post-training motivation.

The mixed results regarding the effects of learner control suggest learners in SDL environments have different experiences that would lead them to different preferences for SDL. Accordingly, persons with a weak SDLP participating in an educational program that is designed to promote learner control are less likely to utilize or value the control they have been

given, resulting in low motivation to learn and transfer learning to their job. Therefore, the following is hypothesized:

Hypothesis 3a: Andragogical design (AD) will moderate the relationship between self-directed learning preference (SDLP) and motivation to improve work through learning (MTIWL): The moderation will be positive when there is congruence between SDLP and AD, such that high SDLP will be positively associated with MTIWL in a strong AD context and low SDLP will be positively associated with MTIWL in a weak AD context. When SDLP and AD are not congruent, the moderation will be negative, such that high SDLP will be negatively related with MTIWL in a weak AD context and low SDLP will be negatively related with MTIWL in a strong AD context.

Andragogical design is proposed to interact with SDLP to influence perceived TU.

When individuals want and experience an educational program that allows them greater self-direction in their learning, they are more likely to believe the training has positive utility. The same is expected to be true when individuals who do not want self-direction are not required to take control of elements of their learning experience. It is the congruence between SDLP and AD that is likely to influence TU positively. In contrast, training participants who desire control over the learning process but who are heavily restricted in what they can influence or who prefer to assume little responsibility for their learning process but find much of that responsibility is placed on them in a training program may question the utility of the training content. Stated another way, an incongruent pairing of SDLP and AD is more likely to have a negative influence on training utility.

Perceived TU specifically targets the link between training and training transfer.

Training reactions are thought to consist of an affective and utility component. The affective component captures how trainees feel about the training – their likes and dislikes. Utility perceptions focus on the job relevance of training content and are believed to be more closely

related to learning and behavioral outcomes. The research surrounding utility perceptions generally has focused on its ability to predict learning and training transfer outcomes. A meta-analysis by Alliger, Tannenbaum, Bennett, Traver, and Shotland (1997) showed utility perceptions were much more strongly related to learning and job performance measures than was affective reactions, whereas the overall correlations were weak and near zero for affective reactions. Ruona, Liembach, Holton, and Bates (2002) found participants' utility reactions had a small but significant predictive influence on motivation to transfer and concluded, perhaps hastily, that reactions offer little in terms of the assessment of training effectiveness.

An educational program that is structured using an AD gives learners the opportunity to make decisions that would adapt the program to meet their immediate training needs. The reasons prompting the initiation of training are important criteria along which to judge perceived TU. For example, immediate training needs have been shown to have a positive influence on perceived learning and training application (Lim & Johnson, 2002; Lim & Morris, 2006). TU also is a function of an individual's perceived need to improve job performance and the expectancy that new skills will be practical for application and improve performance (Burke & Hutchins, 2007).

Learner control in training may facilitate the fulfillment of immediate training needs by allowing learners to focus on what is important to them. Research on participative decision-making supports the involvement of learners in decisions about their learning because learners are likely to be more welcoming of and committed to choices they help to make. Therefore, learners may derive greater satisfaction from a course using an AD (Orvis et al., 2009) because they perceive it to provide greater utility for their job performance. Individuals with a high

SDLP will desire greater learner control because it may allow them to choose and sequence training content (Orvis et al., 2009) in a way that gives them the most training utility.

Persons with a low SDLP require few, if any, opportunities to direct their learning because they may believe that learner control adds little to the utility value of training. Low SDLP may occur because learners do not possess the self-regulatory or metacognitive skills that may be necessary to use learner control effectively (Orvis et al., 2009). Educational programs may also cause learners to experience SDL in a negative manner by overwhelming learners with complex learning activities they must engage in or failing to provide any support as learners adjust to an AD. Such experiences can lead learners generally to dislike SDL, wish to avoid it in future learning experiences, and perceive a training program using SDL as negatively influencing training utility. For example, a learning contract between a facilitator and learner can be used to structure the learning process to assist learners as they assume greater responsibility for their learning as part of an AD. Although potentially beneficial for learning, learning contracts can present certain challenges to learners (e.g., anxiety, time involvement, and required negotiation skills; Matherson, 2003) that can indirectly create negative perceptions of SDL and programs that use SDL as part of the AD. Thus, persons with a weak SDLP should benefit more from a program that matches their desire for minimal self-direction. Therefore, the following is proposed:

Hypothesis 3b: Andragogical design (AD) will moderate the relationship between self-directed learning preference (SDLP) and training utility (TU): The moderation will be positive when there is congruence between SDLP and AD, such that high SDLP will be positively associated with TU in a strong AD context and low SDLP will be positively associated with TU in a weak AD context. When SDLP and AD are not congruent, the moderation will be negative, such that high SDLP will be negatively related with TU in

a weak AD context and low SDLP will be negatively related with TU in a strong AD context.

### **Summary of Study Hypotheses**

Hypothesis 1a: Locus of control (LOC) will influence motivation to improve work through learning (MTIWL) such that individuals with an internal LOC (low LOC score) will have greater MTIWL compared to individuals with an external LOC (high LOC score).

Hypothesis 1b: Locus of control (LOC) will influence self-directed learning preference (SDLP) such that individuals with an internal LOC (low LOC score) will have a stronger SDLP compared to individuals with an external LOC (high LOC score).

Hypothesis 2a: Self-directed learning preference (SDLP) will be positively associated with motivation to improve work through learning (MTIWL).

Hypothesis 2b: Self-directed learning preference (SDLP) will be positively associated with training utility (TU).

Hypothesis 3a: Andragogical design (AD) will moderate the relationship between self-directed learning preference (SDLP) and motivation to improve work through learning (MTIWL): The moderation will be positive when there is congruence between SDLP and AD, such that high SDLP will be positively associated with MTIWL in a strong AD context and low SDLP will be positively associated with MTIWL in a weak AD context. When SDLP and AD are not

congruent, the moderation will be negative, such that high SDLP will be negatively related with MTIWL in a weak AD context and low SDLP will be negatively related with MTIWL in a strong AD context.

Hypothesis 3b: Andragogical design (AD) will moderate the relationship between self-directed learning preference (SDLP) and training utility (TU): The moderation will be positive when there is congruence between SDLP and AD, such that high SDLP will be positively associated with TU in a strong AD context and low SDLP will be positively associated with TU in a weak AD context. When SDLP and AD are not congruent, the moderation will be negative, such that high SDLP will be negatively related with TU in a weak AD context and low SDLP will be negatively related with TU in a strong AD context.



### **CHAPTER 3: RESEARCH METHOD**

This chapter provides an outline of the process used to examine the hypotheses described in the previous chapter. The research design including the study participants, measures, data collection process, and data analysis procedures are explained.

#### **Participants and Procedures**

Data for this study were drawn from a non-random, volunteer sample of adults enrolled in continuing education (CE), non-credit, professional development courses at a large public university in the Southern United States during the August 2013 to December 2013 period. Approximately 510 CE enrollees from 36 class meetings were asked to participate in the study. There were 24 non-credit, face-to-face courses in which enrollees participated; these ranged in duration from one day to five days and were advertised as providing high-value, highly practical information that enrollees could immediately apply to their job. These 24 courses were further classified into six CE categories: (1) Computer and Information Technology (10%), (2) Safety Management (7%), (3) Business and Technical Communication (8%), (4) Business Project Management (13%), (5) Purchasing and Supply Management (1%), and (6) Human Resource Management (61%). Refer to Appendix A for a complete listing of courses by category.

The principal investigator or collaborating partner met with each class, explained the nature of the study, and sought participants' voluntary consent to take part in the study. The questionnaire was administered in two units. Unit 1 contained questions on personal characteristics (i.e., locus of control, self-directed learning preference, and control variables) and were collected using a printed questionnaire on the first day of each course before

instruction began. Unit 2 included items concerning course perceptions (i.e., andragogical design, motivation to improve work through learning, and training utility) and an additional measure to assess possible common method bias; these were collected using an electronic questionnaire after the completion of each course. The items are divided somewhat evenly across units with 43 items contained within Unit 1 and 39 items within Unit 2. In total, participants complete 82 questions in this study. A copy of the consent form and study questionnaire appears in Appendices C and D, respectively. The principal investigator used a post-paid, cash lottery as a response inducement. Participants were given a random chance to win one of seven \$75 cash gift cards, if they completed both Unit 1 and Unit 2 of the questionnaire.

Of the 416 course enrollees who completed the Unit 1 questionnaire, 315 persisted and completed the Unit 2 questionnaire. After removing duplicate participants ( $N = 3$ ), participants who started Unit 2 but did not complete it ( $N = 2$ ), participants with more than 10% missing data on study constructs ( $N = 8$ ), participants who reported being unemployed or had an unidentified employment status ( $N = 6$ ), participants under the age of 25 ( $N = 11$ ; 25 years or older constituted adult status in this study), and multivariate outliers ( $N = 8$ ), there remained 277 matched Unit 1 and Unit 2 questionnaire completers.

A decision was made to retain respondents in the sample with less than 10% missing data. Missing data occurred on only two focal constructs – self-directed learning preference (SDLP) and locus of control (LOC) – with the majority of missing data evident on the locus of control construct. Data with less than 10% missing can generally be ignored when they appear to be missing completely at random (Hair, Black, Babin, & Anderson, 2010). Conservatively,

retaining data with less than 10% missing on the focal constructs made it less likely that their presence would bias the results of the study. Missed questions on these cases appeared to follow no particular pattern and were retained in the study. This conservative threshold also was utilized because some respondents reported difficulty choosing between options on the LOC scale. Cases excluded because of missing SDLP items ranged from 20% to 100% missing on the SDLP measure. The LOC measure contained 23 items; due to the large range of possible values, an LOC score still was calculated by summing available responses for respondents who missed only one or two items on the measure (less than 10% of missing data on measure,  $N = 15$ ). These 15 respondents were retained in the sample. Cases excluded because of missing LOC items ranged from 13% to 100% missing on the LOC measure. An analysis of variance (ANOVA) comparing LOC scores of these 15 respondents to the rest of the sample revealed no significant difference in means ( $F = .76, p = .47$ ).

The response rate for completing the entire survey was approximately 75%. Among the 277 respondents, 57 percent were female, 48 percent ranged in age from 41 – 55 years, 99 percent were employed full- time, 56 percent were employed in the public sector, 28 percent identified as minorities, 68 percent possessed a bachelor's or higher-level degree, and 67 percent enrolled in one-day CE courses. Although Unit 1 of the questionnaire was collected directly after it was administered by either of the study investigators, participants averaged 4.32 days in completing Unit 2 of the survey; 52 percent of respondents completed Unit 2 in two or fewer days (range of less than 1 day to 33 days). Refer to Appendix B for more detailed respondent characteristics.

This group of CE enrollees was selected for this study of self-direction in adult learning because it contained persons who had achieved adult status and who were participating in a work-related educational experience designed to facilitate the learning of adults. Adult status refers to persons attaining the age of 25 (Rachal, 2002); there were 277 ( $N = 285$  prior to the removal of eight outliers) participants meeting this requirement in this study.

The design of the questionnaire allowed data to be collected on the LOC and SDLP constructs through the Unit 1 questionnaire prior to participants dropping out of the study and failing to complete the Unit 2 questionnaire. Data on these constructs were then used to compare the group of completers (Unit 1 and Unit 2 of questionnaire) to non-completers (Unit 1 of questionnaire only). An analysis of variance (ANOVA) revealed no significant differences in LOC and SDLP between the two groups. The ANOVA results appear in Table 1.

Table 1: ANOVA results for LOC and SDLP Comparisons.

Variables		Sum of Squares	<i>df</i>	Mean Square	F	<i>p</i>
Locus of Control x Level of Completion	Between Groups	1.72	1	1.72	.16	.69
	Within Groups	4157.78	373	11.15		
	Total	4159.50	374			
Self-direction in learning preference x Level of Completion	Between Groups	6.44	1	6.44	3.76	.05
	Within Groups	638.20	373	1.71		
	Total	644.64	374			

*Note:*  $N = 277$  for completers (matched Unit 1 and Unit 2 questionnaires) and  $N = 98$  for non-completers (Unit 1 questionnaire only).

### Data Screening – Normality and Outliers

The maximum likelihood (ML) estimation technique used in the SEM analysis assumes multivariate normality of the endogenous variables (i.e., self-directed learning preference,

motivation to improve work through learning, and training utility), and independence of the exogenous variables (i.e., locus of control and andragogical design). Computer simulation studies assessing the robustness of ML estimation against nonnormality suggest that parameter estimates are relatively robust against nonnormality. Even so, results of statistical tests tend to show a positive bias, which too often leads to the rejection of the null hypothesis (Kline, 2005). The data were assessed for outliers and normality (univariate and multivariate) to determine the data's suitability for ML estimation.

Z-score values were used to judge whether a case possessed an outlier for any of the focal constructs. Nine cases were identified as univariate outliers in the sample; six of the nine cases identified as multivariate outliers were removed from the sample. Small samples (80 or fewer observations) define outliers as having standard scores greater than 2.5, whereas large sample sizes use a threshold standard value of 4 (Hair, Black, Babin, & Anderson, 2010). As the sample used in this study reflected a medium sample size, a z-score of 3.3 was used as the cutoff. Table 3 shows that univariate outliers appeared in all endogenous constructs. The Mahalanobis  $D^2$  statistic, a multivariate assessment of each observation's distance from the mean center of all other observations (Hair et al., 2010), was used to assess multivariate outliers. A conservative  $p$ -value of .001 or .005 has been recommended to classify multivariate outliers. Eight cases had  $p$ -values < .005 and were removed. Table 2 provides the result of the univariate and multivariate outlier analysis.

The removal of eight multivariate outliers greatly improved the normality of the endogenous variables in the study. Normality is the most fundamental assumption of multivariate analysis. Mardia's multivariate kurtosis statistics facilitated the assessment of

multivariate normality. The results of the normality assessment prior to and after the removal of eight outliers appear in Table 3. Skewness values remained at a slight level of nonnormality

Table 2: Univariate and Multivariate Outlier Detection Results.

Univariate Outliers		Multivariate Outliers	
Cases with Standardized Absolute Z-Values > 3.3		Cases with Value of $D^2$ Significance $p < .005$	
Variable	Case	Case	Mahalanobis $D^2$
LOC	No Cases	<b>92</b>	20.72
SDLP	62, 96, 268, <b>284</b> , 298	<b>96</b>	25.91
AD	No Cases	<b>129</b>	24.60
MTIWL	145, 174, <b>284</b>	<b>145</b>	19.58
TU	257	<b>174</b>	21.09
		<b>257</b>	26.10
		<b>284</b>	45.11
		<b>298</b>	24.20

*Note:* LOC – locus of control. SDLP – self-directed learning preference. AD – andragogical design. MTIWL – motivation to improve work through learning. TU – training utility.

(-2 to +1) after the outlier adjustment, while kurtosis values that indicated a range of slight, moderate (+1 to +2.3) and severe nonnormality (> +2.3) generally exhibited only slight non-normality after the outlier adjustment (Lei & Lomax, 2005). Critical ratio (C.R.) values (also z-values) greater than +1.96 and less than -1.96 at a .05 error level indicated statistically significant univariate nonnormality. Specific examination of the endogenous variables revealed skewness on SDLP and TU significantly departed from normal; kurtosis significantly varied from normal on SDLP. The overall test of multivariate normality suggested no significant issues with multivariate nonnormality. Explicitly, the Mardia's coefficient was 1.53, and the kurtosis C.R. value of 1.52 did not exceed the +1.96 critical value.

Table 3: Univariate and Multivariate Assessment of Normality.

Variable	Min Score	Max Score	<i>N</i> = 285, Outliers Included				<i>N</i> = 277, Outliers Removed			
			Skew	Skew c.r.	Kurtosis	Kurtosis c.r.	Skew	Skew c.r.	Kurtosis	Kurtosis c.r.
LOC	.00	18	.02	.10	-.41	-1.42	.00	.01	-.45	-1.52
SDLP	1.00	7	-1.29	-8.88	3.00	10.34	-.81	-5.48	1.04	3.52
AD	1.00	5	-.46	-3.16	-.13	-.45	-.41	-2.78	-.18	-0.60
MTIWL	2.13	5	-.82	-5.65	2.20	7.59	-.20	-1.34	-.02	-.06
TU	1.33	5	-.77	-5.33	1.00	3.46	-.45	-3.05	.16	.53
Mardia's Multivariate Statistic					12.65	12.76			1.53	1.52

*Note:* LOC – locus of control. SDLP – self-directed learning preference. AD – andragogical design. MTIWL – motivation to improve work through learning. TU – training utility. c.r. – critical ratio.

## Measures

All construct measures used in this study were adopted or adapted from previous research. Several constructs (i.e., motivation to improve work through learning, self-directed learning preference, andragogical design, training utility, and creative self-efficacy) were measured using a five- or seven-point Likert or Likert-type scale. The locus of control measure, however, utilized a forced-choice format. All measures are described below and a compiled list of items grouped by variable are included in Appendix C. Internal consistency was assessed with Cronbach's alpha coefficients and appear below with each measure description. The alpha coefficient suggests the extent to which the items of a particular scale were homogenous or internally consistent (Cohen & Swerdlik, 2010).

**Locus of Control (LOC).** Participants' locus of control was assessed with Rotter's (1966) Internal – External Locus of Control scale or I-E scale, which measured a person's perceived control over life events. Rotter (1966) viewed locus of control along a continuum with internal control and external control occupying opposing ends. The I-E scale is a 29-item, forced-choice test with six filler items included to obscure the purpose of the test from

respondents. For each question, persons selected from two possible choices the statement that most reflected their belief. A person's score is the number of external control choices selected. See Appendix C for the scoring mechanism of the I-E scale. Scores can range from zero to 23, with high scores indicating an external orientation and low scores an internal orientation. Cronbach's alpha for the LOC measure in this study was .63.

**Self-Directed Learning Preference (SDLP).** Participants' self-directed learning preference was assessed using an adaptation of the self-directed learning scale of the Andragogy in Practice Inventory (API; Bates & Holton, 2010). The five-item measure asked individuals to rate their preference for self-directed learning on a seven-point scale ranging from strongly disagree (1) to strongly agree (7). This study drew items from the most recent version of the API, which is a 60-item measurement designed to assess beliefs concerning six andragogical principles and eight andragogical design elements pertaining to a specific learning experience. The original self-direction learning scale assessed the extent to which an individual feels responsible for setting learning goals, controlling the learning process, and making decisions about his/her learning effort. In this study, SDLP was defined as a preference for a learning format that allows learners to make key decisions about the format, content, and progression of their learning process. The API's self-directed learning scale was adjusted to reflect this definition. The Cronbach's alpha for the SDLP measure in this study was .85.

**Andragogical Design (AD).** Andragogical design was operationalized as learners' perception of the extent to which a course of instruction allowed them to control lesson planning, learning objectives, and diagnosis of learning needs. AD was measured using three sub-scales of the Andragogy in Practice Inventory: mutual planning, setting objectives, and



diagnosis of learning needs. *Mutual planning* (MP) referred to the degree to which learners perceived themselves as full partners with other learners and the instructor in planning the learning experience. *Setting objectives* (SO) was the extent to which learners felt they had meaningful input and collaboration in setting objectives for the learning experience. Finally, *diagnosis of learning needs* (DLN) captured the degree to which learners perceived they had opportunities or were provided assistance to diagnose their developmental or learning needs.

The setting of objectives and diagnosis of learning needs scales were tested by Holton, Wilson, & Bates (2009). While the setting of objectives scale showed a cohesive factor structure and good reliability ( $\alpha = .903$ ), the diagnosis of learning needs did not emerge from the factor analysis. Additionally, mutual planning was eliminated from the study due to the inability of participants to engage in planning activities. Subsequent work by Bates and Holton (2010) has created new items to represent the setting objectives and mutual planning constructs. This study will be the first test of the new scales and items. All 13 items of the three scales were assessed using a five-point scale ranging from strongly disagree (1) to strongly agree (5). The overall alpha coefficient for the AD measure was .93, which comprised the three subscales MP ( $\alpha = .93$ ), DLN ( $\alpha = .86$ ) and SO ( $\alpha = .90$ ).

**Motivation to Improve Work through Learning (MTIWL).** Naquin & Holton (2002; 2003) proposed that an individual's MTIWL is comprised of the motivation to learn and motivation to transfer training. Participants' MTIWL was measured by items selected from two Strategic Assessment of Readiness for Training scales (START; Weinstein et al., 1994) and two Learning Transfer System Inventory scales (LTSI; Bates, Holton, & Hatala, 2012).

The START was designed to identify learning strengths and weaknesses in adults and determine their readiness to benefit from a learning experience (Weinstein & Palmer, 1994). The original scales consisted of eight, 7-item scales, with ratings ranging from not at all typical of me (1) to very much typical of me (5). In line with ratings of the LTSI, this study instead used a five-point scale with ratings from strongly disagree (1) to strongly agree (5) for the START items. The *attitudes toward training* (ATT) scale and *motivation to participate in training* (MPT) scale from the START were used in the measurement of the MTIWL construct. The attitude scale measured general attitudes toward training and training's value to an individual, whereas the motivation measure assessed willingness to participate in training and complete training related tasks and assignments (Weinstein & Palmer, 1994).

Reliability scores reported by Weinstein et al. (1994) – attitude scale ( $\alpha = .71$ ) and motivation scale ( $\alpha = .65$ ) – were not replicated in Naquin and Holton's (2002) use of the START. Naquin and Holton (2002) removed several items on both the attitude and motivation scales exhibiting factor loadings below .50. As a result, the reported Cronbach's alphas on both scales were .70 (Naquin & Holton, 2002). Following Naquin and Holton (2002), this study used five attitude and three motivation items to assess training attitudes and training motivation as part of the MTIWL construct. The alpha reliability coefficients for the ATT and MPT measures in this study were .68 and .32, respectively.

The LTSI (Bates, Holton, & Hatala, 2012) assessed participants' perceptions of factors influencing training transfer. The inventory includes 16 subscales measuring two construct domains – five scales measuring general training factors and 11 scales measuring training-specific factors. The most recent revision of the LTSI includes 48-items rated from strongly

disagree (1) to strongly agree (5) (Bates, Holton, & Hatala, 2012). The *motivation to transfer* (MTT) scale and *performance outcome expectations* (PEO) scale from the LTSI were used in the measurement of the MTIWL construct. The alpha reliability coefficients for the MTT and PEO measures in this study were .83 and .76, respectively. Due to poor CFA factor loadings and failure of the MPT factor to emerge in an EFA, the MTIWL construct excluded the MPT subscale in the study analysis. This issue is discussed further in Chapter 4. Prior to the removal of the MPT scale ( $\alpha = .33$ ) from the MTIWL construct, the Chronach's alpha coefficient was .80, after the reliability coefficient increased to .83.

**Training Utility (TU).** Participants' judgment that a CE course provided the competencies necessary for subsequent job performance was measured using items from Morgan and Casper's (2000) evaluation of the dimensions of trainee reactions. The six items representing perceived TU reactions were rated on a scale from very dissatisfied (1) to very satisfied (5). The alpha coefficient for TU in this study was .88.

**Creative Self-efficacy (CSE).** Creative self-efficacy acted as a marker variable in the CFA marker procedure that was used to account for the effects of common method variance (CMV) in this study. The procedure involved the selection of a marker variable (MV) or scale that is theoretically unrelated to at least one other substantive scale in the questionnaire and for which the expected correlation equals zero (Lindell & Whitney, 2001; Williams, Hartman, & Cavazotte, 2010). Correlation analysis supported the selection of CSE as a marker variable. Correlation with SDLP neared zero ( $r = .02$ ) and was quite low for AD ( $r = .04$ ) and TU ( $r = .08$ ). Creative self-efficacy captured an affective state similar to the criterion variables of this

study, which increased the likelihood that the MV would be vulnerable to the same method variance contaminants present in other substantive variables.

Creative self-efficacy represented individuals' judgment about their creative ability (Tierney & Farmer, 2002). The items of this scale measured learners' "beliefs about their ability to generate novel and useful ideas and whether they viewed themselves as having a good imagination" (Beghetto, 2006, p. 450). The instrument comprised three items that respondents rated on a scale from not true at all for me (1) to very true for me (5). Creative self-efficacy met MV criteria in that it (1) had a small number of items and narrow definition, (2) was collected in close proximity to and had similar semantic content as criterion variables, (3) required little cognitive effort (Harrison, McLaughlin, & Coalter, 1996), and (4) had been shown to be internally consistent ( $\alpha = .86$ ; Lindell & Whitney, 2001). The Chronbach's alpha coefficient for CSE in this study was .87.

**Control Variables.** Eleven control variables were integrated into this study. These included six demographic items (age, gender, education level, ethnicity, employment status, and job sector), three course-related items (reason for course participation, course type, and course length), and two administrative items (time taken to complete Unit 2 of the study questionnaire and investigator administering the survey). These data were collected to control for potential confounding effects on hypothesized relationships.

Age, gender, education level, and ethnicity are commonly included as demographic variables on learners. Studies examining these variables offer some evidence for their possible influence in this study. For example, learners were found to differ significantly in their preference for an andragogical teaching format by age (Chen, 1994; Richardson, 1994) and

gender (Chen, 1994). The relationship between ethnicity and andragogy principles received mixed support (Norrie & Dalby, 2007). Education levels have predicted motivation for formal education (Chand & Sharmax, 2010), career motivation (Daehlen & Ure, 2009), and learning style preference (Reid, 1987).

Employment status and job sector could influence both motivation and perceptions of training utility (TU) in this study. The list of job sectors appearing on the questionnaire represents the major industry sectors used by the Bureau of Labor Statistics in its North American Industry Classification System. Persons who are employed full-time, compared to part-time, may have more opportunities to immediately use training and have better access to resources that facilitate the effective use of training. Therefore, they may be relatively more motivated to apply new competencies to the job and assign a greater value to their training. The job sector in which participants are employed may indicate how easily and quickly they can utilize CE course content at work, thus influencing participants' motivation and perceived TU.

The motives that direct participants to enroll in a CE course can also affect how they view and rate items contained within the study. There are numerous reasons why adults choose to participate in an educational program including professional improvement and development, personal security, competency development, and professional identity (Grzyb, 1998). Participants may volunteer to take a CE course, be recruited by their employers, attend to refresh existing skills, or enroll to develop new competencies. These different motives may predispose individuals to enter the educational experience more or less motivated and open to the training content. For example, individuals who actively evaluate their strengths and

weakness relative to career goals and who create and implement a plan to achieve career goals are inclined to be more motivated (Colquitt et al., 2000).

Participants in this study were enrolled in a variety of CE courses. It is possible that the course environment, course design, subject matter, and instructor style and competence all shaped the andragogical experience of each course. Accordingly, courses were grouped by subject matter and a variable was created to identify course types. Courses varied in length, which provided varying levels of exposure to the course design and instructor. For this reason, a control variable was also added to account for course length. Participants differed in the length of time taken to complete Unit 2 of the questionnaire. Differences in responses due to the time elapsed between the end of training and completion of Unit 2 were accounted for with a variable that captured the elapsed time. Finally, two investigators alternately administered the survey and a control variable was created to account for possible investigator effects.

The control variables described in this study were categorical or continuous in nature. Categorical nominal variables with three or more categories (i.e., age, ethnicity, reason for course participation, job sector, and course type) were first assessed in a multivariate analysis of variance (MANOVA) prior to inclusion in the structural equation modeling (SEM) analysis. This was done to make the structural model assessing the effects of the control variables more parsimonious. A series of MANOVAs were conducted in which each control variable was assessed against the group of endogenous variables in the study (i.e., SDLP, MTIWL, and TU). This was done to determine if there were significant differences in the endogenous variables based on the control variables. Where MANOVAs revealed significant differences, post hoc analyses were conducted to determine which variable categories were responsible for the

effects and should be include in the SEM analysis. For example, if one or more categories of the job sector variable were found to significantly influence TU, a dummy variable representing each of the significant categories was created and included in the structural model by drawing a path from the dummy variables to the TU latent construct.

Education level was treated as an ordinal variable with an underlying continuous distribution and inserted as an observed variable in the SEM analysis. Although age could be viewed as an ordinal variable, it was restricted to three categories to capture participants' adult status and was treated as a nominal variable due to the variable's restricted range. Gender, employment status, and course administrator all contained two categories, were coded as 1 and 0, and inserted as dummy variables into the SEM analysis. Finally, course length and time taken by respondents to complete the Unit 2 questionnaire were measured in days and inserted in the SEM analysis as continuous observed variables. Frequency analysis of all control variables in this study can be found in Appendix A and a diagram of their inclusion in the Complete Structural Model appears in Appendix G.

### **Analysis Procedure**

Structural equation modeling (SEM) was used to test the hypothesized research model with AMOS 22, an add-on module for SPSS 22 designed for SEM analysis. SEM integrates multiple regression and factor analysis and typically estimates a structural model using a series of regression equations based on latent and other factors (Martin, 2011). It allows the inclusion of latent constructs, which are specified by multiple indicators, thereby separating the analysis of relationships between constructs from the analysis of relationships between constructs and their indicator variables (Kline, 2011). This powerful multivariate technique also permits the

simultaneous estimation of relationships among multiple exogenous and endogenous latent variables. This study contained 13 exogenous variables (i.e., locus of control, andragogical design, and 11 control variables), three endogenous variables (i.e., self-directed learning preference, motivation to improve work through learning, and training utility), and one interaction term (i.e., self-directed learning preference X andragogical design).

The validity of the measurement model was assessed using goodness-of-fit indices that provided indications of how well the estimated covariance matrix fitted the observed covariance matrix (Hair et al., 2010). The fit indices used in this study were recommended by Kline (2005) and Hair et al. (2010): (1) the model chi-square value and associated degrees of freedom, (2) the Bentler comparative fit index (CFI; Bentler, 1990), (3) the Steiger-Lind root mean square error of approximation (RMSEA; Steiger, 1990) with its 90% confidence interval, and (4) the standardized root mean square residual (SRMR). This study utilized guidelines by Hair et al. (2010) for assessing good model fit using samples with  $N > 250$  and more than 30 indicator variables:  $CFI > .90$ ,  $RMSEA < .08$  (with CFI of .90 or greater and its 90% confidence interval not surpassing .10),  $SRMR \leq .08$  (with CFI above .92), and an expected significant chi-square  $p$ -value. Factor loadings on latent constructs (.5 or higher, and ideally, .7 or higher) and Chronbach alpha values (.7 or higher) provided evidence of individual item reliability on each scale. Composite reliability (CR) was calculated to assess the overall reliability of the latent construct with values of .70 or above providing evidence of good reliability (Hair, Anderson, Tatham, & Black, 1998). Average variance extracted (AVE) measured the amount of variance captured by the latent construct indicators relative to error



variance resulting from random measurement error (Fornell & Larcker, 1981). Values above .50 were indicative of convergent validity (Fornell & Larcker, 1981).

The validity of the structural model was assessed following the validation of the measurement model. A new covariance matrix was created to represent the hypothesized paths of the structural model. Model fit was assessed using the same fit indices described for the measurement model. Similar fit between the measurement model and structural model would indicate good fit in the structural model (Hair et al., 2010). To test if an alternative model provided a better fit to the data, a nested model was created in which the basic structural model was nested in a model with an additional path drawn directly from TU to MTIWL. Perceived job utility of training has previously been shown to significantly predict training-related motivation (Clark, Dobbins, & Ladd, 1993). The possibility that greater perceived TU may motivate individuals to use training to improve job performance provided the theoretical support for this relationship and the inclusion of this path in the model. Both models were compared using a chi-square difference statistic; a significant reduction in chi-square would indicate the alternative model with the additional path had better fit. The structural relationships specified in the research hypotheses will be assessed by the significance and predicted direction of the parameter estimates.

**Testing Moderated Hypotheses.** Latent interaction modeling using SEM was used to test the hypothesized latent causal relationships in this study using the unconstrained, mean centering approach (Marsh, Wen, & Hau, 2004) for representing interaction terms. Regression analyses often understate the interaction effect and exhibit low statistical power because they fail to control for measurement error in the predictor variables (Busemeyer & Jones, 1983).

Alternatively, latent interaction modeling makes it possible to account for different kinds of random error and nonrandom measurement error (Steinmetz, Davidov, & Schmidt, 2011).

Little, Bovaird, and Widaman (2006) proposed the residual centering approach to modeling latent interactions as an alternative to the unconstrained mean centering approach. The residual centering approach (Little et al., 2006) uses regression residuals to act as indicators of latent interaction constructs. Alternatively, the mean-centering approach first centers the indicators of first-order latent constructs and then multiplies them to create a product term to represent the indicators of the interaction latent variable (Marsh et al., 2004). Mean-centering is proposed as a means to address issues of multicollinearity. In the unconstrained method, it is likely that the product terms of the interaction constructs will be correlated with the main effect constructs (Jackman, Leite, & Chochrane, 2011). Therefore, prior to creating product terms for the latent construct, main-effect indicators are mean centered (e.g.,  $\text{var1} - \bar{X}_{\text{var1}}$ ). Both the residual centering approach and the mean-centering approach have generally produced similar outcomes (Marsh, Wen, Hau, Little, Bovaird, & Widaman, 2007). Accordingly, the simpler mean-centering approach was chosen for this study.

In this study, the latent construct SDLP and AD had five and 13 indicators, respectively, thus resulting in 65 (5X13) possible indicators. Given the large number of product indicators for the interaction of AD and SDLP, the indicator parceling method was used in combination with the mean-centering approach (Marsh et al., 2004; Marsh, Wen, Hau, 2006). The parceling approach was chosen to reduce the unwieldy number of indicators for the interaction construct (AD\*SDLP) down to a manageable 12-item set. Item parceling was first

proposed in the 1950s and since then has become a common strategy for handling latent construct indicators (Bandalos & Finney, 2001).

There are several reasons why parceling may be preferred to an all-item approach. Compiled or parceled indicators generally exhibit more reliability and normal distribution, and have values that are more continuously distributed (Hall, Snell, & Singer-Foust, 1999). A comparison of three item-reduction strategies (multiplying parcels of the larger scale by indicators of the smaller scale, multiplying the three most reliable indicators of each scale matched by reliability, and matching items by reliability to create as many product indicators as the number of indicators of the smallest scale) revealed no significant difference in statistical power, except that the use of the three most reliable indicators of both scales produced the least power (Jackman et al., 2011). As indicated by previous research (Hau & Marsh, 2004; Marsh, Hau, Balla, & Grayson, 1998), parceling indicators performed similarly to using the most reliable indicators of the largest scale method and produced unbiased estimates (Jackman et al., 2011).

The parceling approach involved multiplying parcels of indicators from the larger scale (i.e., AD) by the indicators of the smaller scale (i.e., SDLP). As the AD scale was comprised of three subscales (mutual planning, diagnosis of learning needs, and setting of objectives), its structure provided three pre-determined parameters by which items could be grouped. The mutual planning (MP) scale and diagnosis of learning needs (DLN) scale contained four items each with loadings ranging from .75 to .97 and .69 to .85, respectively. The setting of objectives (SO) scale comprised five items with loadings ranging from .73 to .82. One item from the SDLP scale was dropped due to a low factor loading (.47) and excluded from the

interaction term. Therefore, four items from the SDLP measure (loadings ranging from .67 to .83) and three parceled items from the AD scale were multiplied to form 12 product indicators for AD\*SDLP. The latent interaction term was created in two steps. First, all AD and SDLP items were mean-centered prior to creating product terms. Second, the averages of the mean-centered items on the MP, DLN, and SO scales were then multiplied by the mean-centered SDLP items.

In this study, a moderating effect would be observed when there was a significant path coefficient connecting the interaction term (i.e., SDLP\*AD) to either endogenous variable (i.e., MTIWL or TU; Baron & Kenny, 1986). The computation of the product interaction term was performed in SPSS and previously has been described in this section. AMOS was used to test the moderated hypotheses of this study. Model fit was assessed following guidelines by Hair et al. (2010) outlined earlier in this section.

### **Statistical Power, Sample Size, and Structural Equation Modeling**

This section will discuss the sample size for this study in relation to statistical power and SEM. The power of a statistical test is the probability of a test achieving a statistically significant result (Cohen, 1988). Errors inherent in hypothesis testing can result in the rejection of a true null hypothesis (Type 1 error) or the acceptance of a false null hypothesis (Type II error). Power is the probability of rejecting the null hypothesis in favor of the alternative or research hypothesis when the null hypothesis is false or, in statistical notation,  $1 - \beta$  (Hinkle, Wiersma, & Jurs, 2003). As the power of a test increases, so too does its ability to detect the phenomenon of interest, if it exists (Cohen, 1988). Accordingly, high power increases the likelihood of establishing the tenability of a research hypothesis (Liu, 2011).

The power of a statistical test improves as sample size increases. The reliability of a sample always depends on its size (Cohen, 1988). Hence, as sample size increases, statistical estimates achieve increased precision and the power of statistical tests improve (Murphy, Myers, & Wolach, 2011). The use of small sample sizes in SEM research have tended not to produce “good-quality solutions” (Jung, 2013, p. 76) and increase the chance of nonconvergence (Boomsma & Hoogland, 2001). Kline (2005) defined small samples as those with less than 100 observations, but a more inclusive definition is fewer than 200 cases (Boomsma & Hoogland, 2001). Issues of model complexity and type of estimation algorithm in SEM analysis have made it difficult to develop definitive rules for sample size in order to produce reliable solutions and parameter estimates (Kline, 2005; Tanachart & Sardar, 2010).

A general rule of thumb relating sample size to model complexity is the ratio of sample cases (N) to estimated parameters (q) or the N:q ratio. Ideally, this ratio is 20:1 (Jackson, 2003) but is recommended to be between 5:1 and 10:1 (Bentler & Chou, 1987) for maximum likelihood (ML) estimation. The ratio of sample cases (N) to the number of variables in a model (p) should be  $N/p \geq 10$ . In the latter case, this study, which has 71 measured variables across five constructs, would require at least 710 observations. The N:q and the N/p both require very large samples sizes, even when a structural model is not particularly complex.

Alternatively, Boomsma and Hoogland (2001) emphasized using a ratio of the number of indicators per factor (or NI/NF ratio) to determine minimum sample size and reduce the possibility of nonconvergence. Boomsma (1982), supported by Marsh et al., (1998), advised a minimum sample size of 100 for an NI/NF = three or four, but as few as 50 observations if the

NI/NF ratio increased to six or 12. The inference made is that a larger NI/NF ratio may compensate for a smaller sample size and vice versa (Boomsma & Hoogland, 2001).

Researchers recommend absolute minimum sample sizes for SEM analysis ranging from 100 (e.g., Kline, 2005; Bowen & Guo, 2011) to 200 (e.g., Barrett, 2007; Boomsma & Hoogland, 2001), and 400 (e.g., Boomsma & Hoogland, 2001), given such considerations as model complexity, incidence of missing data, and average error variance of indicators (Hair et al., 2010). Recent testing and development in SEM has allowed greater precision in sample size recommendations. Based on model complexity and basic measurement model characteristics, Hair et al. (2010) advised the following minimum sample sizes that are relevant to the number of constructs used in this study.

- $N \geq 100$ : Models comprising five or fewer latent constructs, each with more than three measured variables (items) and with high item communalities (.6 or higher)
- $N \geq 150$ : Models comprising seven or fewer latent construct, modest communalities (.5), and no underidentified latent constructs

In this study, all retained communalities loaded at .5 or higher, there were no major issues with nonnormality, and  $N = 277$ . Accordingly, the study met and exceeded the minimum sample requirements for SEM use.

### **Issue of Common Method Variance**

Since data for this study were collected entirely by self-report survey, careful consideration was given to the issue of common method variance (CMV). Data collection methods can bias results by influencing variance in outcome measures (Campbell & Fiske,

1959). Method variance refers to variance that is attributable to the method used for data collection, rather than the construct, items, scale, response format, or general content of the measure (Fiske, 1982). When a study uses one method across multiple constructs and variables, they will share the possible measurement error introduced into the study by the common method (Spector & Brannick, 2010). The concern here is that measurement error can inflate or deflate relationships between constructs and lead to the inappropriate rejection or acceptance of research hypotheses (Hinkle, Wiersma, & Jurs, 2003; Podsakoff, MacKenzie, & Podsakoff, 2003).

The findings of self-report surveys often are questioned because CMV may have biased the results (Spector & Brannick, 2010). Cross-sectional studies of attitudes and behaviors are particularly susceptible to inflated correlations between constructs due to CMV (Lindell & Whitney, 2001). There is evidence to suggest that approximately one quarter of all systematic error variance in observed correlations can be attributed to method variance. Cote and Buckley (1987) conducted a meta-analysis examining method variance across 70 studies in marketing, psychology-sociology, business, and education literatures to find method variance accounted for approximately 26.4% of total error variance. Due to the prevalence of survey use in social science research, several research design and statistical approaches have been proposed to control the effect of method variance.

**Research Design.** This research design utilized a time lag between Unit 1 and Unit 2 data collection based on Podsakoff et al.'s (2003) recommendation for temporal separation in the measurement of predictor and criterion variables. Unit 1 and Unit 2 data collection were separated by a minimum of approximately 22 hours based on the duration of the shortest CE

course (i.e., one day). This means that persons enrolled in a CE course lasting one day completed Unit 1 at the very beginning of the CE course and Unit 2, at the earliest, the following morning. Data collection periods were also proximally distinct; Unit 1 data collection occurred on campus in a CE classroom, while Unit 2 took place after a course ended in a non-classroom environment. Since Unit 1 and Unit 2 data collection points were separated by time and space, this precaution should diminish the “saliency of any contextually provided retrieval cues” that could bias responses (Poksakoff et al., 2003, p. 888). In order to match respondents across data collection periods, the researcher could not guarantee respondents anonymity, but assured respondents that their email would be used for no other purpose than to match their responses and that their individual responses would not be shared with CE program staff members.

**Statistical Approach.** This study used the CFA marker technique (Richardson, Simmering, & Sturman, 2009; Williams, Edward, & Vandenberg, 2003; Williams et al., 2010) to detect possible CMV. It involved modeling the relationship between the latent marker construct and the other variables believed to share CMV (Richardson et al., 2009). CMV is believed to be represented by the shared variance between the MV and another substantive variable with which it is expected to be theoretically unrelated. CMV is assessed by comparing the fit of five CFA models: (1) CFA Model, (2) Baseline Model, (3) Noncongeneric or Method-C Model, (4) Congeneric or Method-U Model, and (5) Restricted Method or Method-R Model (Richardson et al., 2009; Williams et al., 2010). Each of these models is represented in Figure 3. The chi-square difference between the Baseline Model and Noncongeneric Model, the Noncongeneric Model and Congeneric Model, and the Noncongeneric or Congeneric



Model and the Restricted Method Model are computed and compared for significance (Richardson et al., 2009).

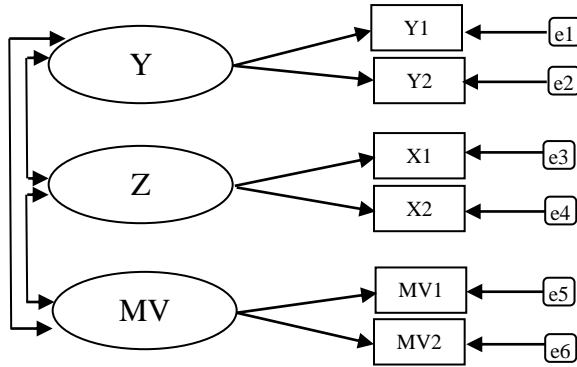
The CFA Model correlated all focal latent constructs (i.e., self-directed learning preference, andragogical design, motivation to improve work through learning, and training utility) and the latent marker variable (creative self-efficacy). Locus of control was treated as a measured variable in the study and not included in the CMV analysis. The CFA Model was evaluated to obtain factor loadings and measurement errors for the indicators of the marker variable that later were used in the Baseline Model (Williams et al., 2010).

The Baseline Model used the factor structure of the CFA Model with paths to the marker latent variable fixed to zero and the indicators of the marker variable using fixed factor loadings derived from the CFA Model analysis. The unstandardized loadings for the creative self-efficacy marker variable were 1.01, 1.08, and .99; the unstandardized errors were .17, .13, and .29. These factor loadings and error variances were used in all subsequent analyses.

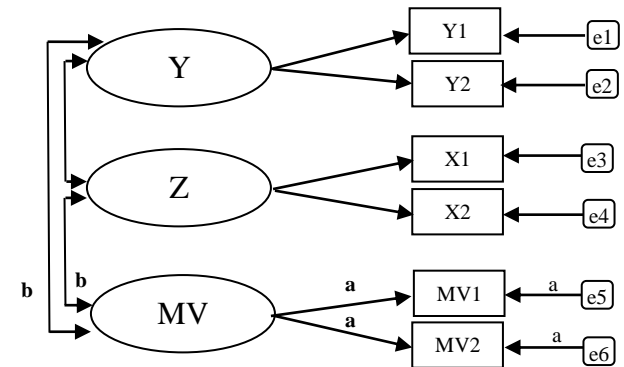
The Noncongeneric Model remained the same as the Baseline Model with the exception that paths were drawn from the latent marker variable to each of the indicators on the other four latent constructs. These parameters were constrained to be equal to one another. The Congeneric Model utilized the same paths from the latent marker variable to the indicators of the other constructs but allowed the paths to be freely estimated (Richardson et al, 2009; Williams et al., 2010).

The Restricted Method Model was identical to either the Noncongeneric Model or Congeneric Model. The choice of which model depended on which was rejected in the chi-square difference test. The Restricted Method Model used the unstandardized factor loadings

### A. CFA MODEL

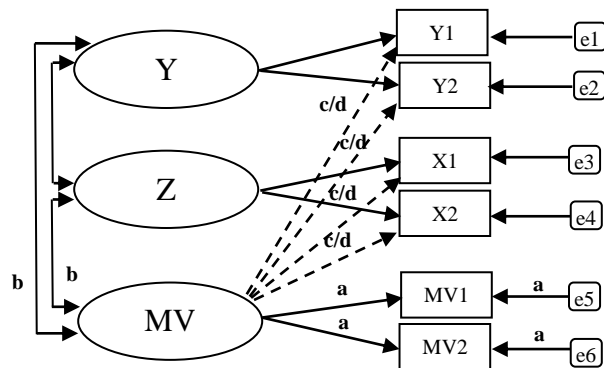


### B. BASELINE MODEL



### C. NONCONGENERIC MODEL

### D. CONGENERIC MODEL



### E. RESTRICTED METHOD MODEL

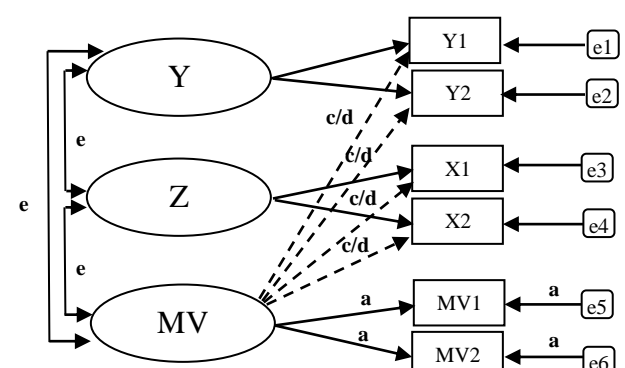


Figure 3: CFA Marker Technique.

*Note:* a – symbolizes parameters set to values obtained from the confirmatory factor analysis (CFA) model. b – factor correlations fixed to zero. c – paths constrained to equal one another. d – paths set free to be freely estimated. e – factor correlations fixed to those in Baseline Model

obtained from the focal constructs (i.e., self-directed learning preference, andragogical design, motivation to improve work through learning, and training utility) in the Baseline Model as fixed values in this model. A significant chi-square difference between the Baseline and Noncongeneric Model suggests evidence of CMV in the data. If the Congeneric Model fits the data significantly better than the Noncongeneric model, it indicates the impact of the marker variable was not equal for all loadings of the focal construct indicators (i.e., congeneric effects). If there exists a significant difference between the Noncongeneric Model or Congeneric Model and the Restricted Method Model, the correlations were significantly biased by the marker variable. The CFA marker variable (creative self-efficacy) previously was described in the measures section of this chapter.

## CHAPTER 4: RESULTS

This chapter reports the findings of the reliability and validity assessments for study measures, results of the hypotheses tests, and outcome of the common method variance (CMV) analysis. Details about the sample and methodology were presented in Chapter 3.

### **Preliminary Analysis**

Although the measures used in this study were found to be acceptable in previous research, an assessment of the scales was necessary to determine their validity and reliability in this study. Table 4 summarizes the descriptive statistics, Cronbach's alphas, composite reliabilities (CR), and average variances extracted (AVE) for variables in the study.

The Cronbach's alphas on the self-directed learning preference (SDLP), motivation to improve work through learning (MTIWL), andragogical design (AD), training utility (TU), and creative self-efficacy (CSE) constructs exceeded the .70 lower limit of satisfactory internal consistency ( $\alpha$  values ranged from .83 to .93). These latent constructs all exhibited good CR during the CFA with scores greater than .7 and ranging from .81 to .88. AVE scores, measures of convergence among a set of items representing a latent construct, suggested adequate convergence above .5 and ranged from .59 to .70.

The LOC measure performed less reliably at  $\alpha = .63$  and CR = .63. Additionally, because reliability values tend to increase with the number of scale items, more stringent requirements are required for large-item scales (Hair et al., 2010), such as the 23-item LOC scale used in this study. The AVE score of .09 indicates much of the variance captured by the construct was due to random measurement error.

Table 4: Basic Statistics of the Study.

	1.	2.	3.	4.	5.	6.
1. Locus of Control						
2. Self-directed Learning Preference	-.10					
3. Andragogical Design	-.17**	.04				
4. Motivation to Improve Work through Learning	-.30**	.12*	.42**			
5. Training Utility	-.18**	.04	.44**	.52**		
6. Creative Self-Efficacy	-.19**	.02	.04	.20**	.08	
Mean	9.26	5.68	3.03	4.05	4.00	4.19
Standard Deviation	3.27	.96	.77	.46	.69	.72
Cronbach's Alpha Reliability	.63	.84	.93	.83	.88	.87
Composite Reliability	.63	.85	.86	.81	.88	.88
Average Variance Extracted	.09	.59	.67	.60	.60	.70

Note. N = 277

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

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

Table 5 summarizes the scale items removed from the analysis because of low factor loadings revealed in the confirmatory factor analysis (CFA). Low factor loadings suggested problems in the MTIWL factor structure, particularly that of the motivation to participate in training (MPT) second-order construct. Accordingly, a follow-up exploratory factor analysis

Table 5: Scale Items Removed from Study.

	Construct	Item	Loading
1.	Motivation to participate in training - (MTIWL)	I come to training sessions unprepared. (R)	.37
2.	Motivation to participate in training - (MTIWL)	I try hard not to miss any of the sessions during a training program.	.35
3.	Motivation to participate in training - (MTIWL)	I can easily find an excuse for not completing a training program assignment. (R)	.39
4.	Attitude toward training - (MTIWL)	As long as I get good raises or promotions, I do not care whether or not I participate in training. (R)	.35
5.	Self-directed learning preference	The training programs I like best are those in which I feel responsible for my own learning.	.47
6.	Training Utility	The course objectives were communicated to me in clear and understandable terms.	.48

Note. R – reverse-coded items. MTIWL – motivation to improve work through learning.

(EFA) of MTIWL was conducted to examine possible item cross loadings. The EFA was fixed to extract the four subscales of the MTIWL construct. The results supported the suspicion that the MPT items and the low-loading attitude toward training (ATT) item were loading on other factors. Table 6 shows the EFA pattern matrix.

Table 6: EFA Pattern Matrix.

MTIWL 2 <sup>nd</sup> Order Constructs	Item	Factor 1	Factor 2	Factor 3	Factor 4
ATT	M1			.76	
	M2			.78	
	M3		.24	.51	
	<b>M4(R)</b>				.90
	M5(R)			.36	.25
MPT	<b>M6(R)</b>	.36			
	<b>M7</b>			.32	
	<b>M8(R)</b>	.23			.23
MTT	M9	.57			
	M10	.73			
	M11	.59			
	M12	.83			
POE	M13		.58		
	M14		.88		
	M15		.73		

Note. ATT - attitude toward training. MPT – motivation to participate in training. MTT – motivation to transfer training. POE – performance outcome expectations. (R) – reverse-coded item.

Items loading at .50 or higher were retained in the study. All six excluded items had factor loadings in the range of .35 to .48, which was sufficient to meet the minimal level for interpretation of the factor structure, but insufficiently high to reach the .50 or greater threshold generally considered necessary for practical significance (Hair et al., 2010). Reverse-coded

items presented a challenge for the MTIWL measure. Three of the four reverse-coded items on this scale were removed and the fourth just exceeded the .50 cutoff with a value of .53. Since all items on the *motivation to participate in training* (MPT) scale loaded in the range of .35 to .39 and did not emerge as a factor in the EFA, the entire scale was dropped from further analysis. Table 7 displays the standardized factor loadings for items retained in the study. The reliability and validity scores presented in Table 4 reflect the omission of the discussed scale items.

Table 7: Standardized Factor Loadings.

Scales	# of Scale Items	Standardized Factor Loadings
Self-directed Learning Preference	4	.66, .75, .81, .83
Training Utility	5	.58, .80, .81, .81, .87
Creative Self-Efficacy	3	.77, .85, .89
<i>Andragogical Design</i>		
Mutual Planning	4	.75, .82, .87, .97
Diagnosis of Learning Needs	4	.69, .71, .76, .85
Setting of Objectives	5	.73, .75, .78, .79, .82
<i>Motivation to Improve Work though Learning</i>		
Attitude Toward Training	4	.51, .53, .73, .75
Motivation to Transfer Training	4	.70, .71, .77, .81
Performance Outcome Expectations	3	.62, .74, .81

Table 8 presents the model fit statistics for each of the five models assessed in this study: (1) measurement or confirmatory factor analysis model (CFA Model), (2) structural model (Basic Structural Model), (3) nested alternative structural model (Alternative Model), (4) structural model with interaction construct included (Structural Interaction Model), and (5)

structural model with interaction construct and control variables included (Complete Structural Model).

### **Confirmatory Factor Analysis and Hypotheses Testing**

The locus of control (LOC) measure was treated as an observed, rather than unobserved or latent variable, because of the forced choice nature of the scale. Each of the 23 LOC questions was associated with a binary response (i.e., score of 1 for an external locus response and 0 for a non-external locus response) and has a very limited range of possible scores. The CFA Model, which included four latent constructs (i.e., self-directed learning preference, andragogical design, motivation to improve work through learning, and training utility) exhibited good fit of the model to the data ( $\chi^2 = 717.87$ ,  $df = 473$ , CFI = .95, RMSEA = .04, and SRMR = .07). The results showed RMSEA fell between .037 and .050 with 90% confidence.

The Basic Structural Model included the above named latent constructs in addition to the observed locus of control (LOC) variable. The model showed good fit ( $\chi^2 = 819.12$ ,  $df = 505$ , CFI = .94, RMSEA = .05, and SRMR = .09), providing initial support for the study hypotheses. RMSEA fell between .041 and .053 with 90% confidence. In the (nonequivalent) Alternative Structural Model, an additional path from TU to MTIWL was included. Its inclusion represented a theoretically plausible alternative to the hypothesized model, as greater perceived value in training may influence training attitudes and perceptions of work outcomes. The Alternative Structural Model provided a better fit to the data compared to the hypothesized structural model -  $\chi^2 = 760.05$ ,  $df = 504$ , CFI = .95, RMSEA = .04, and SRMR = .07. RMSEA fell between .037 and .049 with 90% confidence. A chi-square difference test revealed a



Table 8: Model Fit Statistics.

Model	<i>df</i>	$\chi^2$	CFI	RMSEA	SRMR
1. CFA	473	717.87***	.95	.04	.07
2. Basic Structural	505	819.12***	.94	.05	.09
3. Alternative Structural	504	760.05***	.95	.04	.07
4. Interaction Structural	940	1576.32***	.92	.05	.07
5. Complete Structural	1022	1652.76***	.92	.05	.07
$\chi^2$ Model Comparison Tests			$\Delta df$	$\Delta \chi^2$	$\chi^2$ C.V.
1. Basic Structural vs. Alternative Structural			1	59.07	3.84

Note. N = 277

The Alternative Structural Model included an additional path from TU to MTIWL. This path was significant ( $p < .001$ ) and resulted in a significant  $\chi^2$  difference test. The path was retained in the study.

The Structural Interaction Model included the AD\*SDLP interaction latent construct.

The Complete Structural Model included the AD\*SDLP interaction latent construct and control variables.

\*\*\*,  $p < .001$

significant improvement in model fit over the Basic Structural Model. The TU to MTIWL path was significant at  $p < .001$  and retained in subsequent analysis. In the Interaction Structural Model, the latent interaction term (i.e., AD\*SDLP) was created using the mean-centering and parceling method approach (Marsh et al, 2004; 2006) and added to the model. This model also exhibited good fit -  $\chi^2 = 1576.32$ ,  $df = 940$ , CFI = .92, RMSEA = .05, and SRMR = .07.

RMSEA fell between .045 and .053 with 90% confidence.

The Complete Structural Model remained the same as the Interaction Structural Model with the exception of the addition of 17 dummy and continuous variables. The analysis of the categorical control variables previously has been described in Chapter 3. Age and ethnicity were excluded as non-significant control variables during the MANOVA, and Table 9 shows

Table 9: Categorical Control Variable Analysis – Between-Subject Effects.

Control Variable	Dependent Variable	df	Mean Square	F	Significance Level
1. Age	SDLP	2	.25	.26	.77
	MTIWL	2	.31	1.49	.23
	TU	2	.32	.67	.51
2. Ethnicity	SDLP	4	1.50	1.63	.17
	MTIWL	4	.16	.73	.57
	TU	4	.77	1.64	.17
3. Course Type	SDLP	5	1.32	1.43	.21
	MTIWL	5	.91	4.59	.000***
	TU	5	.90	1.93	.09
4. Reason for Course Participation	SDLP	7	.77	.82	.57
	MTIWL	7	1.18	6.31	.000***
	TU	7	.83	1.78	.092
5. Employment Sector	SDLP	11	1.38	1.54	.12
	MTIWL	11	.67	3.45	.00***
	TU	11	.68	1.46	.15

*Note:* SDLP – self-directed learning preference. MTIWL – motivation to improve work through learning. TU – training utility.

\*\*\*.  $p < .001$

the between-subjects results in which employment sector, reason for course participation, and course type were found to have a significant effect on the endogenous variable, MTIWL. Post hoc analyses using Tukey' HSD (honestly significant difference) revealed significant differences in MTIWL across the categories of employment sector, reason for course participation, and course type. Table 10 shows the significant differences across categories identified in the post hoc analyses. These categories were then turned into dummy variables where 1 represented the category and 0 all other categories of the variable. All other control variables were entered into the Complete Structural Model as a dummy variable (i.e., gender, questionnaire administrator, employment status) or observed variable (i.e., education level,

Table 10: Categorical Control Variable Analysis – Post Hoc Analysis Results.

Dependent Variable	Control Variable (I)	Control Variable (J)	(I – J) Mean Difference	Significance Level
Employment Sector				
MTIWL	Government	- Construction	-.34	.03*
		- Professional & Business Services	-.48	.003**
Reason for Course Participation				
MTIWL	Attendance Required by Employer	- Personal Growth/Self-Improvement	.23	.05*
		- Update Skills	.33	.000***
		- Acquire Skills	.33	.002**
		- Prepare for Promotion and Advancement in my organization	.49	.000***
Course Type				
MTIWL	Computer & Information Technology	- Business Project Management	.36	.02*
		- Human Resource Management	.39	.000***

Note. MTIWL – motivation to improve work through learning.

\*,  $p < .05$ . \*\*,  $p < .01$ . \*\*\*,  $p < .001$

course length, and time to complete Unit 2 questionnaire). Significant control variables (i.e., employment status and computer technology course type) were retained for analysis in the final Complete Structural Model, while all other non-significant controls were removed. A comparison between complete structural models in which one model retained all non-significant and significant control variables and the other included only significant control variables revealed comparable standardized regression weights between the focal constructs (absolute differences ranged from .002 to .049) and no change in hypotheses outcomes. Appendix G depicts the Complete Structural Model with control variables.

Analysis of the Complete Structural Model showed full-time versus part-time employment had a significant influence on SDLP (standardized regression weight = .18,  $p < .05$ ) and computer technology course type had a significant effect on MTIWL (standardized regression weight = .23,  $p < .001$ ). The Complete Structural Model demonstrated acceptable fit

-  $\chi^2 = 1652.76$ ,  $df = 1022$ , CFI = .92, SRMR = .07, and RMSEA = .05, which fell between .043 and .051 with 90% confidence. All hypotheses tests were based on the Complete Structural Model. Appendices E and F contain additional information on the Basic Structural and Interaction Structural Model.

Only three of the six hypothesized relationships were supported in this study. Figure 4 summarizes the outcomes of the hypotheses tests and is based on the Complete Structural Model. Figure 5 depicts the Alternative Structural Model in which a path was included from TU to MITWL that provided a better fitting model. Hypothesis 1a and 1b stated that LOC would be positively related to MTIWL and SDLP; hypothesis 1b was not supported. It was expected that as LOC decreased (i.e. moved from an external LOC to internal LOC), MTIWL and SDLP would increase. Correlation analysis indicated a significant negative relationship between LOC and MTIWL ( $r = -.30$ ,  $p < .01$ ) and non-significant but negative relationship between LOC and SDLP ( $r = -.10$ ,  $p > .05$ ), which was indicative of the relationships found in the SEM analysis. Standardized regression weights of LOC effects were  $-.14$ ,  $p < .05$  for MTIWL and  $-.10$ ,  $p > .05$  for SDLP. Supplementary examination of the first-order constructs comprising MTIWL was necessary to gain a clearer understanding of the relationship between LOC and MTIWL. Table 11 presents the standardized regression weights representing the effects of SDLP, LOC, AD, AD\*SDLP, and TU on the three subscales (ATT, MTT, and PEO) of the MTIWL construct. The results indicate that LOC was negatively related to all MTIWL subscales as hypothesized, but only significantly influenced PEO. Therefore, persons exhibiting an internal LOC had more positive expectations regarding how their training-related performance would be rewarded at work.

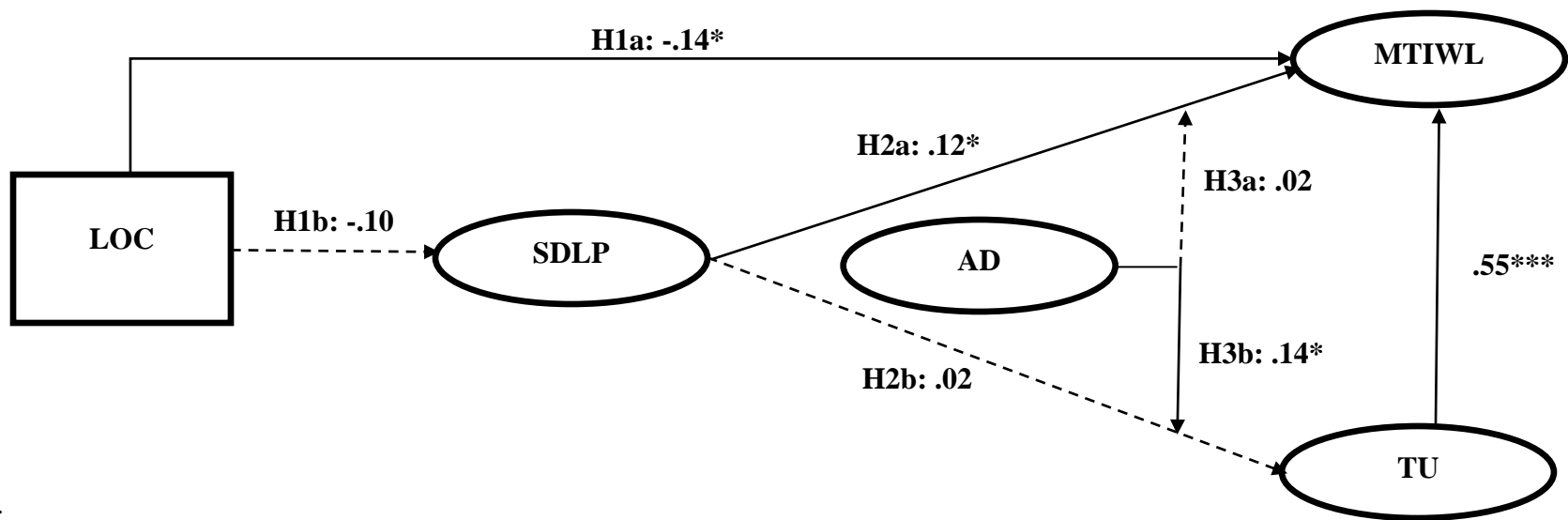


Figure 4: Hypothesis Testing Structural Model.

*Note.* LOC (locus of control), SDLP (self-directed learning preference), AD (andragogical design), MTIWL (motivation to improve work through learning), TU (training utility).

Standardized regression weights shown

\*.  $p < .05$ , \*\*\*.  $p < .001$

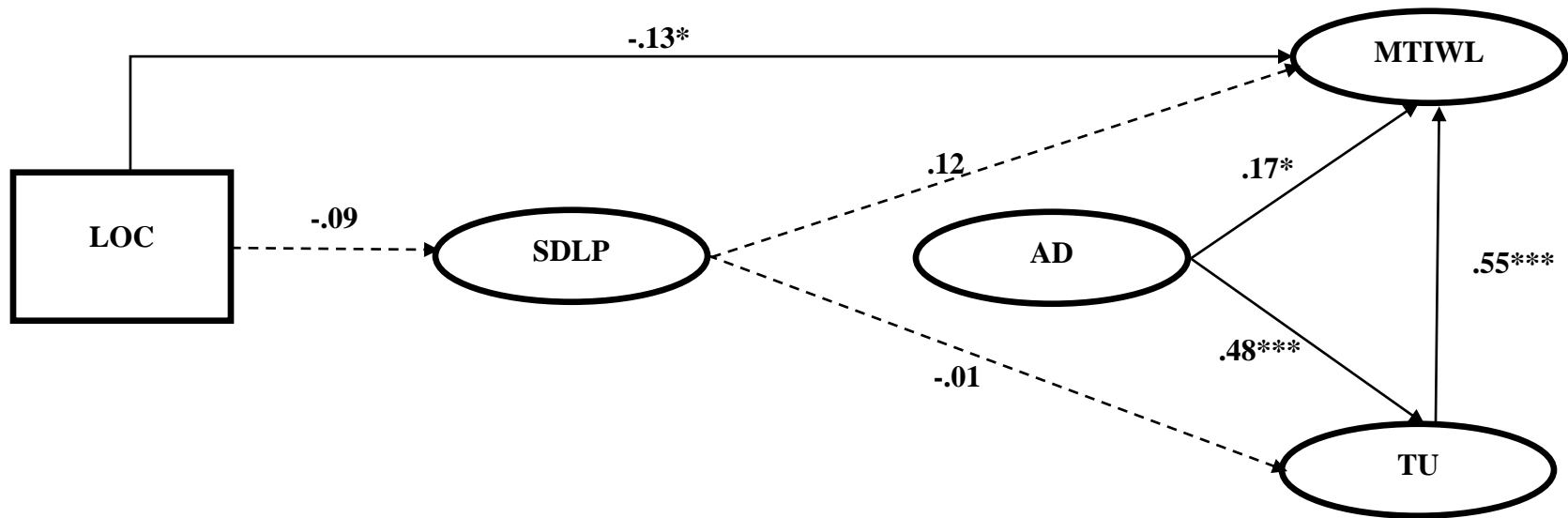


Figure 5: Alternative Structural Model.

Note. LOC (locus of control), SDLP (self-directed learning preference), AD (andragogical design), MTIWL (motivation to improve work through learning), TU (training utility).

Standardized regression weights shown

\*.  $p < .05$ , \*\*\*.  $p < .001$

Hypothesis 2a and 2b proposed that SDLP would positively influence MTIWL and TU; only hypothesis 2a was supported. Based on the hypotheses, it was expected that persons with higher SDLP levels would be more motivated to use their training to improve their job performance and would find training more useful for their work requirements. Pearson's correlation coefficient showed a significant positive relationship between SDLP and MTIWL ( $r = .12, p < .05$ ). Although the correlation between SDLP and TU was positive, it was non-

Table 11: Standardized Regression Weights for MTIWL Second-Order Factors.

Construct		MTIWL First-Order Constructs	Standardized Regression Weight
LOC	→	ATT	-.10
	→	MTT	-.09
	→	PEO	-.20*
SDLP	→	ATT	.17*
	→	MTT	.08
	→	PEO	.02
AD-MP	→	ATT	.21***
	→	MTT	.19***
	→	PEO	.11
AD-DLN	→	ATT	-.44***
	→	MTT	-.22***
	→	PEO	.08
AD-SO	→	ATT	.07
	→	MTT	.15*
	→	PEO	.19*
AD*SDLP	→	ATT	.02
	→	MTT	.03
	→	PEO	.07
TU	→	ATT	.54***
	→	MTT	.60***
	→	PEO	.26***

*Note:* LOC – locus of control. SDLP – self-directed learning preference. AD-MP – andragogical design, mutual planning subscale. AD-DLN – andragogical design, diagnosis of learning needs subscale. AD-SO – andragogical design, setting objectives subscale. AD\*SDLP – interaction of andragogical design and self-directed learning preference. TU – training utility. \* $p < .05$ . \*\*\* $p < .001$ .

significant ( $r = .04, p > .05$ ). SEM analysis revealed a similar relationship pattern with a positive significant relationship found between SDLP and MTIWL (standardized regression weight = .12,  $p < .05$ ). Closer examination of the relationship between SDLP and MTIWL showed SDLP was positively and significantly related to attitude toward training (ATT), but only positively related to motivation to transfer training (MTT) and performance expectation outcomes (PEO). The Pearson's  $r$  statistic (.04) and the standardized regression weight (.02) between SDLP and TU generally indicated a weak positive association between the two constructs but were not statistically supported.

Hypothesis 3a and 3b stated that AD would moderate the positive relationships between SDLP and MTIWL, and SDLP and TU. Main effects of AD on MTIWL (standardized regression weight = .17,  $p < .05$ ) and TU (standardized regression weight = .48,  $p < .001$ ) were both positive and significant. If the interaction term AD\*SDLP is significantly related to MTIWL and TU, the moderated hypotheses would be supported. Alternatively, an insignificant relationship between AD\*SDLP and MTIWL and TU would lead to the rejection of the moderated hypotheses. As shown in Figure 4, support was found for H3b but not for H3a. Although there were significant main effects of AD on MTIWL and AD on TU, the interaction of AD and SDLP did not significantly influence MTIWL (standardized regression weight = .02,  $p > .05$ ). Inspection of the interaction effects on MTIWL's first-order constructs revealed no significant effects on ATT, MTT, or PEO (see Table 11). The interaction of SDLP and AD, however, did significantly influence TU (standardized regression weight = .14,  $p < .05$ ).

Although only one of the hypothesized interactions was significant, a plot of both interactions provided additional details concerning the observed relationships. Figure 6



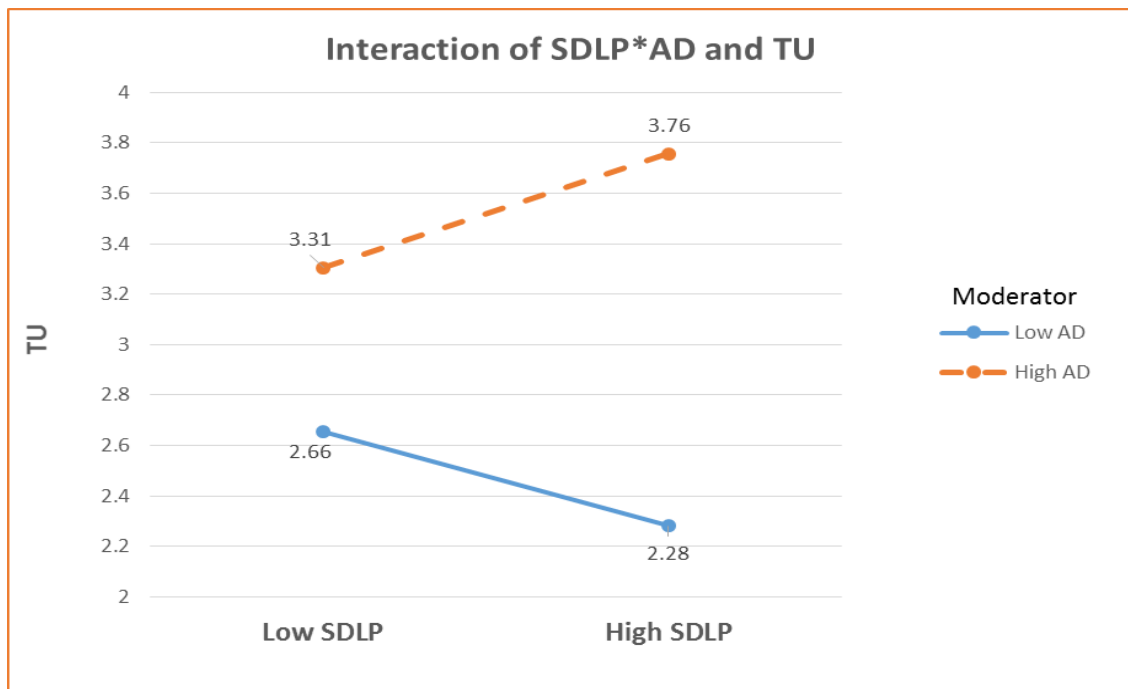
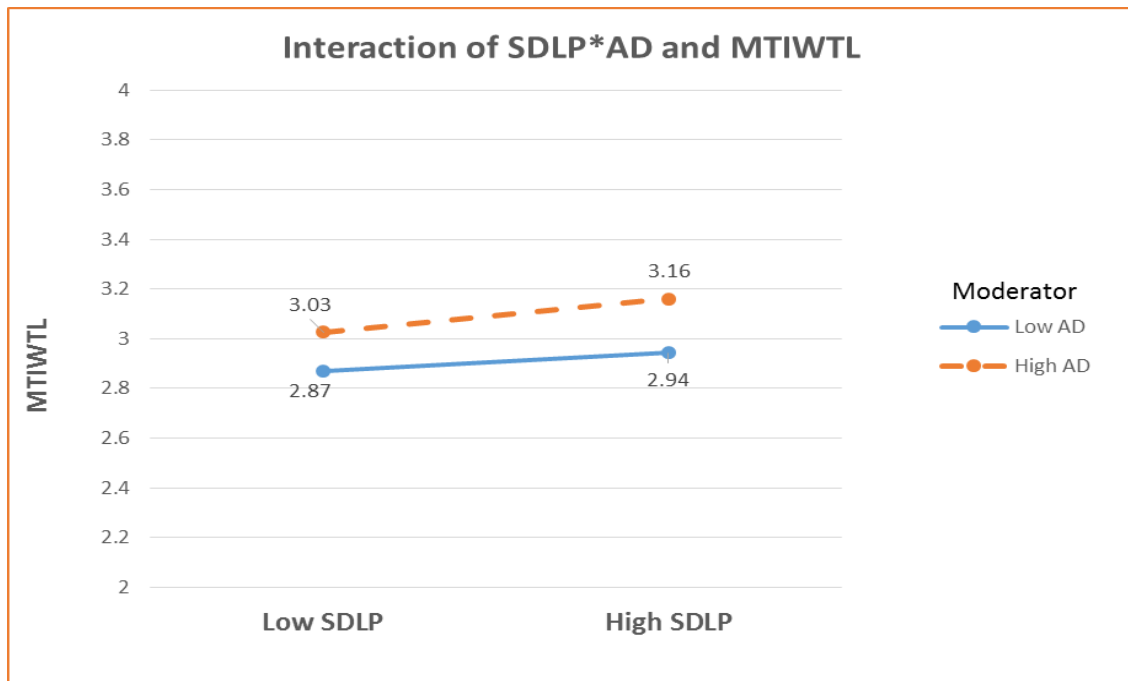


Figure 6: Pattern of Interactions.

*Note:* MTIWL - motivation to improve work through learning. TU - training utility. SDLP - self-directed learning preference. AD – andragogical design.

displays the observed interaction patterns. The interaction hypotheses proposed that a significant interaction would show higher MTIWL and TU scores in congruent SDLP and AD situations (i.e. low AD and low SDLP versus high AD and high SDLP). The interaction of AD\*SDLP was not significantly related to MTIWL (H3a). As diagramed, it shows participants with low SDLP were more motivated to improve work performance through learning in course formats with a high andragogical focus, rather than low andragogical focus. Only when participants had a high SDLP and judged their course to have a high AD were they more motivated to use training to improve their work performance, as was hypothesized. Generally, the plot of the interaction shows that participants exhibited greater MTIWL in courses that contained strong andragogical elements regardless of their SDLP.

Andragogical design significantly moderated the relationship between SDLP and TU (H3b). As hypothesized, congruent situations (i.e., low AD and low SDLP versus high AD and high SDLP) both lead to higher TU. As the interaction plot exposes, when participants were high in their SDLP and the course high in AD, greater TU ( $M = 3.76$  vs.  $M = 3.31$ ) was reported. The case was similar for low AD and low SDLP situations, individuals perceived courses as more useful for their work requirements ( $M = 2.66$  vs.  $M = 2.28$ ). The greatest overall mean difference was observed for persons high in SDLP, suggesting persons with this particular preference were most sensitive to variances in andragogical design elements in training. Indeed, persons perceived greater TU in high AD formats regardless of their SDLP; however, when courses were less learner-directed or restricted learners' opportunities to direct their learning process, persons with a high SDLP were least able to perceive the value of the training for their job needs.

## **Common Method Variance Analysis**

The CFA marker variable technique was used to assess the impact of method bias due to the sole use of self-report questionnaires as a means of data collection in this study. Creative self-efficacy was chosen as the marker variable and has been described, along with the marker variable technique, in the previous chapter. Although attempts were made in the design of the study to temporally separate data collection on the exogenous and endogenous variables, the relative complexity of the study and data collection constraints prevented a complete separation of the variables. Accordingly, a statistical test for the presence of CMV was conducted.

Table 12 summarizes the outcomes of the CFA marker variable analysis. The comparison of the Baseline and Non-concentric model yielded a significant chi-square difference and the factor loadings (fixed to be equal) of the marker variable were significantly related to the indicators of the other latent constructs. The presence of CMV was confirmed through this test. Specifically, the chi-square difference of 4.66 exceeded the 3.84 critical value. A model comparison of the Non-congeneric model and Congeneric Model revealed the impact of CMV on the other focal constructs was equal, rather than biased; the chi-square difference of 41.07 did not exceed the 46.19 critical value. The Non-Congeneric model where the factor loadings were set to be equal, therefore, best accounted for the marker variable effects on the other focal constructs. The comparison of the Non-congeneric model to the Restricted Model did not produce a significant chi-square difference; the chi-square difference of .03 did not exceed the 12.59 critical value. This indicates the marker variable effect did not significantly bias the correlations between the focal variables.

Table 12: Outcomes of Common Method Variance Analysis.

Model	<i>df</i>	$\chi^2$	CFI	RMSEA	SRMR
1. CFA	569	806.50***	.96	.04	.07
2. Baseline	578	817.12***	.96	.04	.07
3. Non-congeneric	577	812.46***	.96	.04	.07
4. Congeneric	545	771.39***	.96	.04	.07
5. Restricted	583	812.49***	.96	.04	.07
$\chi^2$ Model Comparison Tests	$\Delta df$	$\Delta \chi^2$	$\chi^2$ C.V.		
1. Baseline vs. Non-congeneric	1	4.66*	3.84		
2. Non-congeneric vs. Congeneric	32	41.07 <sup>NS</sup>	46.19		
3. Non-Congeneric vs. Restricted	6	.03 <sup>NS</sup>	12.59		

Note: C.V. – critical value. \*. $p < .05$ , \*\*\*. $p < .001$ . NS – not significant.

Overall, the analysis indicated that CMV was present in the data, but the CMV effects were equally distributed among the focal construct indicators and did not bias the factor correlations. Therefore, although CMV was detected, its biasing effects were not. This may suggest the minimal effect of CMV in this study.

## **CHAPTER 5: DISCUSSION**

The purpose of this dissertation has been to present and test a theoretically derived model that extends understanding of adult preferences for self-directed learning and their influence on training- and work-related outcomes. This chapter will provide a brief overview of the study's findings, discuss the theoretical and practical implications of the research, and consider the limitations of the study and directions for future research.

### **Summary of Results**

To accomplish the dissertation purpose, data were gathered and analyzed from a group of adult learners enrolled in non-credit, continuing education courses designed to provide job related skills in a variety of areas that participants would find immediately applicable to their jobs. The personality factor locus of control was proposed to predict learner motivation to use training at work and preference for self-direction in learning contexts. Further, the level of preference for self-directed learning was hypothesized as an antecedent of both learner motivation to apply material taught in training to the work environment and perceived training utility. Finally, the extent to which a course was designed around andragogical principles was anticipated to moderate the relationships between self-directed learning preference, motivation to improve work performance through learning, and perceived training utility.

The results of the hypotheses tests are summarized in Table 13 and present interesting findings to inform current theorizing about adult learning and future research directions. The study found support for the negative effect of locus of control on learner motivation, such that persons with an internal locus of control exhibited a greater inclination to use their training at

Table 13: Synopsis of Study Findings.

Research Hypothesis	Hypothesis Supported	Explanatory Details
<b>H1a:</b> LOC would be negatively related to MTIWL.	Yes	Participants with lower LOC scores (internal LOC) had significantly higher levels of MTIWL compared to those with higher LOC scores (external LOC).
<b>H1b:</b> LOC would be negatively related to SDLP.	No	Participants with lower LOC scores (internal LOC) had higher levels of SDLP compared to those with higher LOC scores (external LOC). The relationship was negative (as hypothesized) but not significant.
<b>H2a:</b> SDLP would be positively related to MTIWL.	Yes	Greater preference for self-directed learning formats was associated with greater MTIWL.
<b>H2b:</b> SDLP would be positively related to TU.	No	Greater preference for self-directed learning formats was associated with higher TU. The relationship was positive (as hypothesized) but not significant.
<b>H3a:</b> AD would moderate the relationship between SDLP and MTIWL. Congruent levels of SDLP and AD (i.e., low SDLP and low AD vs. high SDLP and high AD) would achieve higher levels of MTIWL, compared to incongruent levels (i.e., low SDLP and high AD vs. high SDLP and low AD).	No	Participants with low SDLP in courses with low AD reported lower MTIWL, compared to those in high AD situations (not as hypothesized). Participants with high SDLP in courses with high AD reported higher MTIWL, compared to those in low AD situations (as hypothesized).
<b>H3b:</b> AD would moderate the relationship between SDLP and TU. Congruent levels of SDLP and AD (i.e., low SDLP and low AD vs. high SDLP and high AD) would achieve higher levels of TU, compared to incongruent levels (i.e., low SDLP and high AD vs. high SDLP and low AD).	Yes	Participants with low SDLP in courses with low AD reported higher TU, compared to those in high AD situations (as hypothesized). Participants with high SDLP in courses with high AD reported higher TU, compared to those in low AD situations (as hypothesized).

*Note:* LOC – locus of control. SDLP – self-directed learning preference. AD – andragogical design. MTIWL – motivation to improve work through learning. TU – training utility.

work and had a greater predilection for learning formats that provided them more control over aspects of the learning experience compared to persons with an external locus of control. Evidence was found to suggest adults do have a general liking for self-directed learning ( $M = 5.68$ ,  $SD = .96$  on a scale where 5 = somewhat like and 6 = like). Even so, their preference only had a significant effect on motivation to use training at work, not perceived training utility. The observed relationship between learner preference for self-directed learning and motivation to use training to improve performance was weak, while the effect of learning preference on perceived training utility was almost non-existent. These findings indicate differential effects of learner preferences on training-related attitudes and may suggest self-directed learning preference may not be a critical deciding factor in how adults perceive and are motivated to use training. Andragogical principles provide guidelines for how training can be designed and delivered to better allow trainees to meet the requirements of their jobs. In this study, it was a significant and positive predictor of motivation to improve work through learning and perceived training utility. The andragogical design of a course moderated the relationship between self-directed learning preference and perceived training utility but did not moderate the relationship between self-directed learning preference and motivation to improve work through learning.

### **Contributions to the Literature**

This study measured and found support for Knowles' (1995) assumption that the adult learner's self-concept reflects a self-directed orientation. Empirical tests to better understand adult characteristics that may better facilitate learning have long been advocated for in the literature (Pratt, 1993). Unlike the preponderance of studies that used a mixture of non-adult

and adult participants to test the assumptions and principles of andragogy (Rachal, 2002), this study isolated an adult sample in a non-simulated learning experience to assess their particular preference for self-directed learning. The sizeable sample garnered in this study stands in contrast to many empirical studies of andragogy using small samples (e.g., Ausburn, 2004; Rahmat, & Aziz, 2012; Deveci, 2007; Hewitt-Taylor & Gould, 2002; Nasuti, York, & Henley, 2003; and Strong, Harder, & Carter, 2010) and allows more definitive conclusions regarding the aspects of training over which adults desire greater responsibility. No more than 18% of this study's participants were indifferent to or generally disliked a self-directed learning format. This was true of each question assessing preference for self-directed learning (i.e., goal setting, control over learning content, role in learning experience, decisions about learning progress, and responsibility for learning).

**Hypothesis 1a and 1b Discussion.** The findings of this study suggest that personality remains an important predictor of learner motivation (Deci & Ryan, 1985; Major, Turner, & Fletcher, 2006; Noe, 1986). Similar to Naquin and Holton (2002) who found that Big Five personality traits significantly influenced motivation to improve work through learning, locus of control was found to be a significant antecedent of motivation to improve work through learning in this study. Deci and Ryan (1985) proposed that individuals have a principle way of understanding the events around them that influences their attitudes and behavior. In this study, further analysis of the motivation to improve work through learning construct revealed persons who believed they had greater control over the events around them (i.e., internal locus) were more likely to hold the expectation that changes in job performance would lead to outcomes they value. Contrary to expectations, locus of control did not predict attitudes toward training



and motivation to transfer training to the workplace. This finding indicates that perceived control of life events may not be important for supporting positive attitudes toward training and a desire to use work-related training.

Locus of control did not significantly predict self-directed learning preference in this study, although persons with an internal locus rather than external locus generally exhibited a greater preference to direct their learning experience. Brockett & Hiemstra (1991) noted how important it is to understand the personality characteristics that may act as antecedents to self-directed learning preference. The findings of this study propose that a person's sense of control in relation to their general environment may not be a key factor in determining their preference for self-direction in their learning experiences, which is somewhat surprising given the strong support for self-directed learning expressed in the sample. It may be possible that the observed preference for self-directed learning was inflated due to response bias or the Hawthorne effect. Heimstra (1994) has noted that most people, when asked, will proclaim a preference for self-directed learning. If such was the case in this study, differential effects of locus of control on self-directed learning preferences may have been less prominent.

**Hypothesis 2a and 2b Discussion.** Though strong in nature, self-directed learning preference significantly predicated only one of the two focal outcomes of this study. The study demonstrated that a preference for a learning format that allowed greater control over, for example, decisions about the format, content, and progression of the learning process led to greater motivation to enhance work performance through learning. Specifically, self-directed learning preference demonstrated a positive influence on attitude toward training but was unrelated to motivation to transfer training and performance outcome expectations. These

findings suggest learner preference for self-direction is indicative of training-related attitudes and that tailoring courses to learner preferences can lead to more positive training attitudes. Self-directed learning preference did not predict perceived training utility; although, as discussed later, andragogical design elements did moderate the relationship between self-directed learning preference and training utility.

From the expectancy theory perspective, participants appeared to draw connections between participating in a self-directed learning experience and improved levels of learning and performance, such that greater expectations concerning the value of self-directed learning for the mastery of the training content and work performance motivated individuals to use their training to improve work performance. The overall relationship was weak but significant, reflecting the complexity involved in understanding what motivates individuals to use training. Subsequent analysis of the motivation to improve work through learning construct revealed a significant positive effect on attitude toward training but not motivation to transfer training or performance outcome expectations. These results propose that persons who were willing to assume personal responsibility for learning and viewed it as personally beneficial tended to embody more positive attitudes to training. The preference for self-directed learning did not translate to greater motivation to transfer training or greater expectations that training-related performance would be rewarded on the job. Therefore, it appears assuming responsibility for learning may not be instrumental in motivating individuals to use training or have little effect on a person's expectation that changes in job performance due to training would lead to valued outcomes.

The ability of self-directed learning preference to predict perceived training utility was not substantiated in the study. The expectancy theory perspective tested in this study suggested that providing adults with some control or influence over setting objectives, sequencing learning, or choosing the subject matter would allow them to tailor training in a way that would enhance their perceived training utility. This was not supported even though the observed training utility ( $M = 4.00$ ,  $SD = .69$ , on a scale where 4 = satisfied) in this study indicated that participants judged the training favorably. Nevertheless, this study extends the research examining individual-level factors determining utility judgments. Existing research has focused on such areas as learner needs related to the job (Lim & Morris, 2006), pre-training self-efficacy and motivation (Tracey, Hinkin, Tannenbaum, & Mathieu, 2001), and job involvement (Clark, 1990). This study looked more closely at the design of training programs and asked whether a preference for self-directed learning was a deciding factor in training utility assessments. The findings suggest adults generally do not factor in their preference for self-directed learning into their training utility reactions.

**Hypothesis 3a and 3b Discussion.** The examination of the extent to which training had been structured around andragogical design principles provided noteworthy findings in this study. As a moderating variable, andragogical design was significantly and positively related to learner motivation to improve work through learning and perceived training utility, but only moderated the relationship between self-directed learning preference and perceived training utility. The main effects on learner motivation to improve work through learning (standardized regression weight = .17,  $p < .05$ ) and perceived training utility (standardized regression weight = .48,  $p < .001$ ) were weak to moderate in strength. This outcome suggests that learners find

taking responsibility for their work-related learning both motivating and valuable. The moderating effect of andragogical design on the relationship between self-directed learning preference and training utility revealed individuals valued training more favorably when their preference for self-directed learning (i.e., low versus high) matched the amount of learning responsibility they were required to assume in training (i.e., low versus high andragogical design). Moreover, training utility tended to be higher in high andragogical design situations regardless of learner preference for self-directed learning. Contrary to expectation, andragogical design did not moderate the relationship between self-directed learning preference and motivation to improve work through learning.

Person-environment fit theory was used to conceptualize the hypothesized moderation effect, such that persons would be more motivated and find training more useful if their personal learning preferences aligned with those integrated into a course format. What the results of the graphed interaction for the effect on training utility showed was that congruence between self-directed learning preference and the capacity to direct the learning experience led to more favorable evaluations of training. The finding underscores the importance of identifying and catering to learner preferences as a means to enhance the value learners place on training. Even more revealing was the comparison between learners with a high versus low preference for self-directed learning. When compared to learners with a low preference for self-directed learning, high preference learners reported greater training utility when they are granted more responsibility over their learning but less favorable utility when their learning-related responsibilities were restricted. Accordingly, person-environment fit takes on more or

less importance in the learning environment as a result of differences in individual learning preferences.

The moderation effect was not significant for any component of motivation to improve work through learning, but the significant main effect of andragogical design on motivation to improve work through learning provided some noteworthy results. Investigations of learner control on motivation and trainee reactions have produced mixed results; this study produced similar findings in that it found preference for self-directed learning could not consistently and significantly predict learning motivation. Although self-directed learning has gained considerable attention with the advent of e-learning training formats and packaged computerized training modules, it has not yet proved that it provides a motivational advantage (Bell & Kozlowski, 2002). As examination of the constructs comprising andragogical design and motivation to improve work through learning showed, all measured andragogical design elements (i.e., mutual planning, diagnosis of learning needs, and setting of objectives) significantly influenced motivation to transfer training. Mutual planning and diagnosis of learning needs also predicted training attitudes, while objective setting predicted performance outcome expectations. Such findings help identify the types of learning responsibilities that can have significant influences on training. In view of this, training approaches that encourage greater learner self-direction may be able to capitalize on the positive role active participation can play in the learning and training transfer process.

**Training Utility and Motivation to Improve Work through Learning.** The analysis revealed training utility had a significant positive effect on motivation to improve work through learning that was not originally hypothesized. Sub-factor analysis showed all subscales

of the motivation to improve work through learning construct (i.e., attitude toward training, motivation to transfer training, and performance outcome expectations) were all significantly influenced by training utility. Training reactions previously have been shown to positively predict post-training motivation (Sitzmann et al., 2008) and motivation to learn and transfer training (von Treuer, McHardy, & Earl, 2013). Taken together, the findings of this study capture a more complex relationship between utility reactions and training motivation, which usually is not captured in research studies. This study has demonstrated the importance of measuring the multifaceted nature of training-related motivation. Essentially, the better the match between learner needs and training content, the easier it is for trainees to assess the value of training for their particular work needs, leading to more positive training attitudes, motivation to use training, and ability to perform at levels that are rewarded by their organizations.

### **Implications for Practice**

A primary purpose of this research has been to provide instructional designers, trainers, educational program administrators, and HRD professionals advice to help them better understand the nature of adult learners and design training that meets the needs of their learner population. Organizations are the principle consumers of training products and have gradually increased their investment in recent years to combat the current skills gap in the labor market. Given that organizations are spending roughly \$164.2 billion dollars annually and averaging \$1,195 per employee on training (American Society for Training & Development, 2013), it is important that organizations receive the best return on their investment by making more

informed choices regarding the design of training. Further, learners can be better served when we understand factors influencing their motivation and training perceptions.

From a practical standpoint, many questions must be considered in the design and delivery of training: what format will work best in the delivery of learning content; what learner characteristics are important to consider in achieving desired training outcomes; and when are certain teaching styles most appropriately used. This study showed that self-directed learning or learner control over some aspects of the learning experience was a priority for adult learners. In addressing the question of whether such a preference is important enough that it should be incorporated into training for adult learners, this study offers a few insights. When learners perceived that there was some capacity for self-direction in terms of planning the learning process, diagnosing learning needs, and setting learning objectives in training, it made an overall significant positive impact on motivation to improve work performance through learning and perceived utility of training for work. Importantly, the andragogical course designs in this study were not particularly complex and requiring a great deal of involvement from learners, suggesting that even small steps to involve learners in their learning process could show beneficial returns. The moderation results involving andragogical design indicate that learners with a high preference for self-directed learning can most benefit from learning formats that provide greater responsibility for the learning and least benefit when their learning responsibilities are restricted. This suggests how important it is that individual learning preferences be considered in the design of training when perceived training utility is a critical factor supporting the transfer of training. Importantly, learners were overall most able to assess

and view training positively when they were challenged to assume more responsibility for their learning irrespective of their preference for self-directed learning.

Personality predictors of motivation to use training to improve work performance may offer further guidance with regard to employee selection for training and recruitment efforts. Recruiting based on personality traits that are predictive of motivation to learn has been suggested in the literature (Major, Turner, & Fletcher, 2006). Accordingly, recruiting individuals with internal locus characteristics (e.g., being tolerant of ambiguity and more likely to do well in distance learning situations) may be appropriate when the position requires continuous independent learning and a great deal of internal drive and self-direction. In cases where employers must choose an individual to attend training from amongst a group of deserving candidates, a personality predictor of motivation to use training to enhance work performance such as locus of control may assist in selecting the best candidate.

### **Limitations and Future Research**

**Limitations.** The findings of this study must be considered in light of its limitations. First, the low reliability ( $\alpha = .63$ ) of the locus of control measure calls into question the results associated with this construct. Many studies that have used Rotter's locus of control measure have failed to consider its psychometric properties. This study produced a reliability score similar to the average ( $\alpha = .66$ ) and median ( $\alpha = .69$ ) found in the research (Beretvas, Suizzo, Durham, & Yarnell, 2008). The performance of the locus of control measure may reflect issues of face validity. The locus of control measure assesses perceived control of the general environment and is not specific to the control perceived in an educational context. Comments made by some of the participants of the study while completing the measure suggest that some



individuals distrusted or failed to understand the connection between the locus of control items and the purpose of the overall study. For example, one person questioned whether the scale items were trying to assess if he was of the Republican or Democratic Party. Others found it difficult to choose between the options provided for some questions.

Second, items on the motivation to improve work through learning scale also performed poorly in this study. Although efforts were made to use the higher performing items from Naquin and Holton's (2002) test of the measure, the motivation to participate in training items from the Strategic Assessment of Readiness for Training scale (START; Weinstein et al., 1994) had to be excluded from this study due to poor performance. This prohibited the comprehensive test of the motivation to improve work through learning construct. One low-performing item from the attitudes toward training scale of the START also was taken out of the analysis, but sufficient items remained to capture respondents' attitudes toward training. As the analysis has shown, the START measure continues to plague the evaluation of the motivation to improve work through learning construct and may need to be reconsidered in the future assessment of this construct.

Third, the courses used to assess andragogical design in this study represented only a limited range of possible strategies to provide learners greater control of their learning experience. Given the short nature of the courses (1 – 5 days) and style of instruction, courses leaned toward a low to moderate level of andragogical focus. This limited the level of dispersion on the andragogical design measure such that it may have been difficult to discern the effects of low and high control of the learning process.

Finally, the true causal direction of the unhypothesized relationship between training utility and motivation to improve work through learning is still questionable. In this study, all subscales of the motivation to improve work through learning construct were significantly predicted by training utility. This suggested that utility perceptions preceded the motivation to use training to improve work performance; however, data collection on these constructs were done together prohibiting evidence of temporal separation that would be needed to establish causality. Research has supported training utility as a predictor of post-training motivation (Sitzmann et al., 2008) and motivation to learn and transfer training (von Treuer, McHardy, & Earl, 2013), but has also shown that training motivation can predict utility reactions (Clark et al., 1993; Tracey et al., 2001 ). To examine this convoluted relationship, further analysis of the utility-motivation relationship was conducted by testing a model in which each of the motivation to improve work through learning subscales predicted training utility. The results showed that two subscales had a significant positive effect on training utility. Attitudes toward training (standardized regression weight = .23,  $p < .01$ ) and motivation to transfer training (standardized regression weight = .40,  $p < .001$ ) explained significant variance in training utility. Perceived performance outcome expectations had no influence on training utility, whereas training utility had a significant effect on outcome expectations. The analysis generally showed greater support for the predictive effects of training utility. This study did not set out to explicitly examine the training utility – training motivation relationship. Nevertheless, subsequent examination of the relationship supported the general association between the two but did not, in effect, help to clarify the causal relationship. Further research would be required to disentangle this complex relationship.

**Future Research.** The results of this study propose interesting and worthwhile avenues for future research. First, given that adults expressed a clear preference for self-directed learning, a follow-up research stream would be to understand the circumstances under which self-directed preferences manifest as actual self-directed behaviors. Specifically, when given the choice to assume more control of the learning process, will adults take the option willingly and will their utility reactions, learning outcomes, and affective outcomes differ from learners who are forced to assume a self-directed role in their learning process. Further, investigations are required to prioritize self-directed learning strategies by preference to make clear what aspects of the learning process adults will undertake and why.

Second, the question of whether self-directed learning preference is an appropriate predictor of training-related outcomes remains. Studies of self-directed learning have tended to focus on the outcomes associated with particular self-directed learning strategies. A central purpose of this study was to take a step backward and first evaluate adult preference for self-directed learning. Indeed, this study showed it had a significant effect on training attitudes. Research has shown that learners sometimes lack confidence in their ability to be self-directed (Kim, 2005) and, therefore, are not always able to make the best use of their self-directed learning opportunities (Steinberg, 1977; 1989). Accordingly, studies to identify the skills needed to prepare learners for successful self-directed learning and how to improve learner self-efficacy are needed.

Third, the motivation to improve work through learning construct is a potentially powerful means to gain a more encompassing evaluation of the training transfer process. The construct captures both motivation to engage in training and motivation to transfer training

components (Naquin & Holton, 2003) and considers training motivation in a variety of contexts, including learning and work environments, to aid the evaluation of training effectiveness. The measurement issues encountered in this and previous studies using the combined START and LTSI measures suggest the need to develop a stronger conceptual foundation for the construct and an improved measurement tool. Recently, Von Treuer, McHardy, and Earl (2013) attempted to assess the motivation to improve work through learning construct using entirely different scales. The authors used adaptations of the motivation to learn and motivation to transfer learning scales from the Training Attitudes Inventory and School Administrator Descriptive Survey (Noe & Schmitt, 1986). No attempts to explore or confirm the factor structure of the higher-order motivation construct were made in the study. Instead, the authors used motivation to learn and motivation to transfer as two separate dependent variables in their regression analysis, but drew conclusions about the overall motivation to improve work through learning construct. This study may offer some direction in the selection of items and scales that can otherwise be used to assess learners' motivation to improve work through learning.

Finally, as more organizations utilize self-directed learning in the workplace, it is vital to understand its benefits not only for learning but also for training transfer. For example, are individuals who practice good self-management, self-monitoring, and self-modification better able to transfer their knowledge, especially in cases where knowledge must be transferred to novel situations that require higher levels of metacognition? In addition, at what point does self-directed learning become burdensome to the adult learner and slow any positive gains from the use of self-directed learning strategies? Adults are tasked to balance day-to-day work

challenges with the need to maintain a current and viable skillset. The benefits and costs of self-directed learning are essential considerations in designing training to achieve maximum training transfer.

## **Conclusions**

The dissertation developed and tested a model of self-directed learning in which antecedents and outcomes of adult preference for self-directed learning were assessed. The model was tested on a sample of 277 adult learners enrolled in continuing education courses, where they learned job-related knowledge and skills in areas such as technology, business, and communication. The overall model received partial support and is a first step in examining the value of self-directed learning in a work context. Adults demonstrated a clear preference for self-directed learning that enhanced learner motivation to use training at work. As an antecedent, locus of control predicted motivation to use training to improve work performance but not self-directed learning preference. The extent to which courses had been designed around andragogical principles was assessed and showed significant positive effects on learner motivation and perceived training utility; however, as a moderator, andragogical design moderated the relationship between self-directed learning preference and training utility but failed to moderate the relationship between self-directed learning preference and motivation to improve work through learning. Unlike published studies, which tend to be biased toward positive outcomes (Coursol & Wagner, 1986), dissertations are not bound by publication requirements and may better represent relationships as they truly are. Hopefully, even the unsubstantiated hypotheses of this study will provide evidence of the effectiveness of self-directed learning as an adult learning strategy and contribute fodder for future research.

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## **APPENDIX A: List of Continuing Education Courses**

### **Computer & Information Technology**

1. Access 2010: Introduction to Relational Database Design
2. Microsoft SQL Server Integration Services
3. Access: Database Application Development
4. Graphic Design Basics
5. Introduction to Excel
6. InDesign Essentials
7. Illustrator CS6 Essentials
8. Web-Based JavaScript & jQuery

### **Safety Management**

9. Safe Supervisor
10. Certified Occupational Safety Specialist

### **Business & Technical Communication**

11. Successful Grant Writing
12. Interpersonal Success in the Workplace
13. Public-Speaking: Personal & Professional
14. Technical Writing for Busy Professionals

### **Business Project Management**

15. Essentials of Project Management
16. Quality Assurance Essentials
17. Enhancing Organizational Performance
18. Successful Project Management
19. Estimation & Cost Benefit Analysis

### **Purchasing and Supply Management**

20. Negotiation Strategies

### **Human Resource Management**

21. Fundamentals of Supervision
22. Employee Development & Total Rewards
23. Train the Trainer
24. Developing your Managerial Effectiveness

## APPENDIX B: Detailed Study Participant Characteristics

Table B.1

### Age, Gender, Ethnicity

Age	N	%	Gender	n	%	Ethnicity	N	%
25 - 40	100	36	Male	120	43	Asian	2	1
41 - 55	134	48	Female	157	57	Black/African American	66	24
56 or older	43	16				Hispanic/Latino	7	2
						White/Caucasian	198	72
						Other	4	1
<i>Total</i>	277	100	<i>Total</i>	277	100	<i>Total</i>	277	100

Course Length, Employment Status, Questionnaire Administrator								
Course Length (days)	N	%	Employment Status	N	%	Administrator	N	%
1	186	67	Employed full-time	274	99	Principal Investigator	220	79
2	47	17	Employed part-time	3	1	Collaborating Researcher	57	21
3	29	11						
5	15	5						
<i>Total</i>	277	100	<i>Total</i>	277	100	<i>Total</i>	277	100

Table B.2

## Highest Level/Degree of Education, Employment Sector, Course Participation

Education Level/ Degree	N	%	Employment Sector	N	%	Reason for Course Participation	N	%
Some high school, no diploma	0	0	Construction	23	4	Personal growth/self-improvement	54	19
High school graduate	19	7	Manufacturing	19	8	Update skills for current job	68	25
Some college credit, no degree	39	14	Wholesale & Retail Trade	6	7	Acquire skills for current job	38	14
Trade/technical/vocational training	20	7	Transportation & Utilities	10	2	Prepare for a new career	4	2
Associate's degree	12	4	Information	6	3	Prepare for promotion/advancement	32	12
Bachelor's degree	103	37	Natural Resources & Mining	12	2	Attendance required by employer	76	26
Master's degree	52	19	Financial Activities	8	3	Just for interest	2	1
Professional degree	29	11	Professional & Business Serv.	15	6	Other	1	1
Doctoral degree	2	1	Education & Health Serv.	15	6			
			Leisure & Hospitality	1	1			
			Government	156	56			
			Other	4	2			
<i>Total</i>	276 <sup>a</sup>	100	<i>Total</i>	275 <sup>b</sup>	100	<i>Total</i>	275 <sup>b</sup>	100

Notes: <sup>a</sup> - 1 Missing. <sup>b</sup> 2 Missing

Table B.3

## Continuing Education Course Type, Days to Unit 2 Completion

Course Type	N	%	Days to Unit 2 Completion <sup>c</sup>	N	%
Computer & Information Technology	27	10	<1	56	20
Safety Management	18	7	1 - 2	90	32
Business & Technical Communication	22	8	3 - 5	65	24
Business Project Management	36	13	6 - 10	31	11
Purchasing & Supply Management	4	1	11 - 15	20	7
Human Resource Management	170	61	16 - 25	13	5
			26 - 35	2	1
<i>Total</i>	277	100	<i>Total</i>	277	100

Notes: <sup>c</sup> Days between Unit 2 invitation email and completion of Unit 2 Questionnaire

## APPENDIX C: List of Questionnaire Items Grouped by Variable Name

### Locus of Control (Rotter, 1966)

1.     a. Children get into trouble because their parents punish them too much.  
       b. The trouble with most children nowadays is that their parents are too easy with them.
2.     a. Many of the unhappy things in people's lives are partly due to bad luck.  
       b. People's misfortunes result from the mistakes they make.
3.     a. One of the major reasons why we have wars is because people don't take enough interest in politics.  
       b. There will always be wars, no matter how hard people try to prevent them.
4.     a. In the long run people get the respect they deserve in this world.  
       b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5.     a. The idea that teachers are unfair to students is nonsense.  
       b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6.     a. Without the right breaks one cannot be an effective leader.  
       b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7.     a. No matter how hard you try some people just don't like you.  
       b. People who can't get others to like them don't understand how to get along with others.
8.     a. Heredity plays the major role in determining one's personality  
       b. It is one's experiences in life which determine what they're like.
9.     a. I have often found that what is going to happen will happen.  
       b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10.    a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.  
       b. Many times exam questions tend to be so unrelated to course work that studying in really useless.
11.    a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.  
       b. Getting a good job depends mainly on being in the right place at the right time.
12.    a. The average citizen can have an influence in government decisions.  
       b. This world is run by the few people in power, and there is not much the little guy can do about it.
13.    a. When I make plans, I am almost certain that I can make them work.  
       b. It is not always wise to plan too far ahead because many things turn out to-be a matter of good or bad fortune anyhow.
14.    a. There are certain people who are just no good.  
       b. There is some good in everybody.
15.    a. In my case getting what I want has little or nothing to do with luck.  
       b. Many times we might just as well decide what to do by flipping a coin.



16.
  - a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
  - b. Getting people to do the right thing depends upon ability. Luck has little or nothing to do with it.
17.
  - a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
  - b. By taking an active part in political and social affairs the people can control world events.
18.
  - a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
  - b. There really is no such thing as "luck."
19.
  - a. One should always be willing to admit mistakes.
  - b. It is usually best to cover up one's mistakes.
20.
  - a. It is hard to know whether or not a person really likes you.
  - b. How many friends you have depends upon how nice a person you are.
21.
  - a. In the long run the bad things that happen to us are balanced by the good ones.
  - b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
22.
  - a. With enough effort we can wipe out political corruption.
  - b. It is difficult for people to have much control over the things politicians do in office.
23.
  - a. Sometimes I can't understand how teachers arrive at the grades they give.
  - b. There is a direct connection between how hard I study and the grades I get.
24.
  - a. A good leader expects people to decide for themselves what they should do.
  - b. A good leader makes it clear to everybody what their jobs are.
25.
  - a. Many times I feel that I have little influence over the things that happen to me.
  - b. It is impossible for me to believe that chance or luck plays an important role in my life.
26.
  - a. People are lonely because they don't try to be friendly.
  - b. There's not much use in trying too hard to please people, if they like you, they like you.
27.
  - a. There is too much emphasis on athletics in high school.
  - b. Team sports are an excellent way to build character.
28.
  - a. What happens to me is my own doing.
  - b. Sometimes I feel that I don't have enough control over the direction my life is taking.
29.
  - a. Most of the time I can't understand why politicians behave the way they do.
  - b. In the long run the people are responsible for bad government on a national as well as on a local level.

**Note:** There are six filler items (1, 8, 14, 19, 24, and 27) and 23 scoring items.

### Self-directed Learning Preference (Bates & Holton, 2010)

1. Training programs in which I feel responsible for my own learning.
2. Training programs in which I set my own goals for learning.
3. Training programs in which I have control over what was learned.
4. Training programs in which I have a role to play in my own learning.
5. Training programs in which I make decisions about how my learning will progress.

### Andragogical Design (Bates & Holton, 2010)

#### *Mutual Planning Scale*

1. I had the opportunity to work with others to plan our learning.
2. Learners and instructors shared responsibility for planning the learning process.
3. Learners and instructors cooperated in planning the learning.
4. I collaborated with other learners in planning the learning/instruction.

#### *Diagnosis of Learning Needs Scale*

5. I was helped to diagnose my learning needs.
6. I was helped to assess my weaknesses and identify my developmental needs.
7. I completed activities that helped me identify my learning needs.
8. As part of this learning experience, I did some analysis to figure out the best direction for my learning and development.

#### *Setting of Objectives Scale*

9. I had the opportunity to set my own learning objectives.
10. I had the opportunity to change learning objectives that did not meet my needs.
11. I made decisions that determined what I learned.
12. I made decisions about how my learning progressed.
13. I was able to choose topics I wanted to learn.

### Motivation to Improve Work through Learning (Naquin & Holton, 2002; 2003)

#### *Attitude toward Training*

1. I enjoy training programs that help me to develop knowledge and skills that will be useful to me in my work.
2. I believe training programs are important for my professional development.
3. I volunteer to participate in training programs.
4. As long as I get good raises or promotions, I do not care whether or not I participate in training. (R)
5. I would rather not participate in training. (R)

*Motivation to Participate in Training*

6. I come to training sessions unprepared. (R)
7. I try hard not to miss any of the sessions during a training program.
8. I can easily find an excuse for not completing a training program assignment. (R)

*Motivation to Transfer Training*

9. Training will increase my personal productivity.
10. When I leave training, I can't wait to get back to work to try what I have learned.
11. I believe training will help me do my current job better.
12. I get excited when I think about trying to use my new learning on my job.

*Performance Outcome Expectations*

13. For the most part, the people in my organization who get rewarded are the ones that do something to deserve it.
14. When I do things to improve my job performance, good things happen to me.
15. My job is ideal for someone who likes to get rewarded when they do something really good.

Training Utility (Casper, 2000)

1. The course objectives were communicated to me in clear and understandable terms.
2. The course objectives matched my ideas about what would be taught.
3. The content of the course was highly relevant to my job.
4. The course emphasized information that was most important for my work.
5. This course prepared me to perform my current job tasks more effectively.
6. This course prepared me to perform new job tasks.


Creative Self-Efficacy (Beghetto, 2006; used in common method variance assessment)

1. I am good at coming up with new ideas.
2. I have a lot of good ideas.
3. I have a good imagination.


## APPENDIX D: Study Questionnaire

### PARTICIPANT COPY

### SELF-DIRECTION IN ADULT LEARNING QUESTIONNAIRE – Consent Form

<b>TITLE OF STUDY:</b>	Self-direction in adult learning: Effect of locus of control and program design on learner motivation and training utility
<b>LOCATION OF STUDY:</b>	Continuing Education, Louisiana State University and Agricultural and Mechanical College, Baton Rouge, LA
<b>INVESTIGATOR:</b>	<p>The person in charge of this study is Nicole Cannonier, a Doctoral Candidate in the School of Human Resource Education and Workforce Development at Louisiana State University. Her research is being guided by Dr. Reid Bates (advisor), <a href="mailto:rabates@lsu.edu">rabates@lsu.edu</a>.</p> <p>The investigator listed below is available to answer questions or address concerns.  Nicole Cannonier: <a href="mailto:nwarnel@tigers.lsu.edu">nwarnel@tigers.lsu.edu</a>; (225)-302-4385; M-F, 9:00 a.m. – 5:00 p.m.</p>
<b>PURPOSE OF STUDY:</b>	The investigator hopes to determine the effect of personality, training design, and preference for self-direction in learning on training-related motivation and perceptions of training for adult learners.
<b>PARTICIPANT INCLUSION:</b>	Participants in this study will be adults enrolled in professional development courses offered by Continuing Education at Louisiana State University.
<b>PARTICIPANTS:</b>	250 – 300
<b>STUDY PROCEDURES:</b>	<p>Participants will be asked to complete two questionnaires. Each questionnaire will take about 8 – 15 minutes. The first questionnaire is a paper-and-pencil questionnaire that will be administered at the beginning of the course. It is designed to collect data about the participants' personality, perceptions of training in general, and demographic information such as age, gender, and education. The second questionnaire is an online questionnaire that will be completed after the course has ended. It is designed to collect information about the course and learner motivation.</p>
<b>BENEFITS:</b>	<p>The goal of this study is to better understand the process by which adults learn and the factors in the design of training that affect adult motivation to learn. In addition to advancing the knowledge about adult learning, participants in this study who complete both questionnaires will be eligible to win a Visa gift card valued at \$75. There will be three drawings. Two prizes will be awarded per drawing on <u>September 30, October 28, and November 25, 2013</u>. You will be entered into the drawing(s) that takes place after you have completed both questionnaires. Participants who do not win in a particular drawing will be reentered in a subsequent drawing. The results of each drawing will be communicated by email.</p>
<b>RISKS:</b>	We do not anticipate that this study will cause you any harm or distress. The only possible risk is the inadvertent release of your information. Every effort will be made to keep the information you provide confidential. The data will be kept in a secure, locked location and on a computer with password protection.
<b>RIGHT TO REFUSE:</b>	Participation in this study is voluntary. You may choose not to participate or discontinue the study at any time. Please note that choosing to discontinue the study will void your chance to win one of the Visa gift cards.
<b>PRIVACY:</b>	Your information will be combined with that from other participants, so that any published results will only discuss the combined information. Participant identity will remain confidential unless disclosure is required by law. Identifiable information will be destroyed after data collection is completed and the lottery winners are notified.
<b>SIGNATURE:</b>	<p>This study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigator. The Louisiana State University Institutional Review Board has been established to protect the rights and welfare of human research participants. Please contact Robert C. Mathews with questions or concerns at 225-578-8692, <a href="mailto:irb@lsu.edu">irb@lsu.edu</a>, <a href="http://www.lsu.edu/irb">www.lsu.edu/irb</a>.</p> <p>I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.</p>
	<p><b>Subject Signature:</b> _____ <b>Date:</b> _____</p>

## SELF-DIRECTION IN ADULT LEARNING QUESTIONNAIRE –Consent Form

TITLE OF STUDY:	Self-direction in adult learning: Effect of locus of control and program design on learner motivation and training utility
LOCATION OF STUDY:	Continuing Education, Louisiana State University and Agricultural and Mechanical College, Baton Rouge, LA
INVESTIGATOR :	The person in charge of this study is Nicole Cannonier, a Doctoral Candidate in the School of Human Resource Education and Workforce Development at Louisiana State University. Her research is being guided by Dr. Reid Bates (advisor), <a href="mailto:rbates@lsu.edu">rbates@lsu.edu</a> . The investigator listed below is available to answer questions or address concerns. Nicole Cannonier: <a href="mailto:nwarnel@tigers.lsu.edu">nwarnel@tigers.lsu.edu</a> ; (225)-302-4385; M-F, 9:00 a.m. – 5:00 p.m.
PURPOSE OF STUDY:	The investigator hopes to determine the effect of personality, training design, and preference for self-direction in learning on training-related motivation and perceptions of training for adult learners.
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PARTICIPANTS:	250 – 300
STUDY PROCEDURES:	Participants will be asked to complete two questionnaires. Each questionnaire will take about 8 – 15 minutes. The first questionnaire is a paper-and-pencil questionnaire that will be administered at the beginning of the course. It is designed to collect data about the participants' personality, perceptions of training in general, and demographic information such as age, gender, and education. The second questionnaire is an online questionnaire that will be completed after the course has ended. It is designed to collect information about the course and learner motivation.
BENEFITS:	The goal of this study is to better understand the process by which adults learn and the factors in the design of training that affect adult motivation to learn. In addition to advancing the knowledge about adult learning, participants in this study who complete both questionnaires will be eligible to win a Visa gift card valued at \$75. There will be three drawings. Two prizes will be awarded per drawing on <u>September 30, October 28, and November 25, 2013</u> . You will be entered into the drawing(s) that takes place after you have completed both questionnaires. Participants who do not win in a particular drawing will be reentered in a subsequent drawing. The results of each drawing will be communicated by email.
RISKS:	We do not anticipate that this study will cause you any harm or distress. The only possible risk is the inadvertent release of your information. Every effort will be made to keep the information you provide confidential. The data will be kept in a secure, locked location and on a computer with password protection.
RIGHT TO REFUSE:	Participation in this study is voluntary. You may choose not to participate or discontinue the study at any time. Please note that choosing to discontinue the study will void your chance to win one of the Visa gift cards.
PRIVACY:	Your information will be combined with that from other participants, so that any published results will only discuss the combined information. Participant identity will remain confidential unless disclosure is required by law. Identifiable information will be destroyed after data collection is completed and the lottery winners are notified.
SIGNATURE:	This study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigator. The Louisiana State University Institutional Review Board has been established to protect the rights and welfare of human research participants. Please contact Robert C. Mathews with questions or concerns at 225-578-8692, <a href="mailto:irb@lsu.edu">irb@lsu.edu</a> , <a href="http://www.lsu.edu/irb">www.lsu.edu/irb</a> . I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.
	
<b>Subject Signature:</b> _____ <b>Date:</b> _____	

**Self-Direction in Adult Learning Questionnaire – Part 1**  
**Nicole Cannonier, Doctoral Candidate**  
**School of Human Resource Education & Workforce**  
**Development**  
**Louisiana State University**

For Principal Investigator Use Only	
CS	CH
CE	Code
P2C	CT

**INSTRUCTIONS:** For the following questions, please circle the response that best fits your situation or enter the requested information.

1. What is your email address?
2. What is your age?
  - a. 17 or less years of age
  - b. 18 - 24
  - c. 25 – 40
  - d. 41 – 55
  - e. 56 years or older
3. What is your gender?
  - a. Male
  - b. Female
4. What is the highest level or degree of education you have completed?
  - a. Some high school, no diploma
  - b. High school graduate
  - c. Some college credit, no degree
  - d. Trade/technical/vocational training
  - e. Associate degree
  - f. Bachelor's degree
  - g. Master's degree
  - h. Professional degree (e.g., J. D., M. D., M.B.A., or M. P. A)
  - i. Doctoral degree
5. Which of the following best describes your ethnicity?
  - a. American Indian / Native American
  - b. Asian
  - c. Black / African American
  - d. Hispanic / Latino
  - e. White / Caucasian
  - f. Pacific Islander
  - g. Other, please specify \_\_\_\_\_
6. Which of the following best describes your employment status?
  - a. Employed full-time
  - b. Employed part-time
  - c. Unemployed, (*Skip ahead to question 8*)
7. If employed, which of the following best describes the sector in which you are currently employed? Select only ONE.
  - a. Natural Resources and Mining
  - b. Construction

- c. Manufacturing
  - d. Wholesale and Retail Trade
  - e. Transportation and Utilities
  - f. Information
  - g. Financial Activities
  - h. Professional and Business Services
  - i. Education and Health Services
  - j. Leisure and Hospitality
  - k. Government (federal, state, local)
  - l. Other, please specify \_\_\_\_\_
8. Select the statement that best reflects the main objective of your participation in this Continuing Education course. Select only ONE.
- a. Personal growth/self-improvement
  - b. Update skills for the current job
  - c. Acquire skills for the current job
  - d. Prepare for a new career
  - e. Prepare for promotion and advancement in my organization
  - f. Attendance required by employer
  - g. Just for personal interest
  - h. Other, please specify \_\_\_\_\_
9. What is the name of the Continuing Education course in which you are now participating?
- a. \_\_\_\_\_

**INSTRUCTIONS:** For each of the following pairs of statements, please select the one statement (either “a” or “b”) that you feel is most true. Be sure to select the one you believe is most true, rather than the one you think you should choose or the one you would like to be true. There are no right or wrong answers.

10. a. Children get into trouble because their parents punish them too much.  
b. The trouble with most children nowadays is that their parents are too easy with them.
11. a. Many of the unhappy things in people's lives are partly due to bad luck.  
b. People's misfortunes result from the mistakes they make.
12. a. One of the major reasons why we have wars is because people don't take enough interest in politics.  
b. There will always be wars, no matter how hard people try to prevent them.
13. a. In the long run people get the respect they deserve in this world.  
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
14. a. The idea that teachers are unfair to students is nonsense.

- b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
- 15. a. Without the right breaks a person cannot be an effective leader.
  - b. Capable people who fail to become leaders have not taken advantage of their opportunities.
- 16. a. No matter how hard you try some people just don't like you.
  - b. People who can't get others to like them don't understand how to get along with others.
- 17. a. Heredity plays the major role in determining one's personality
  - b. It is one's experiences in life that determine what they're like.
- 18. a. I have often found that what is going to happen will happen.
  - b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
- 19. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
  - b. Many times exam questions tend to be so unrelated to course work that studying is really useless.
- 20. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
  - b. Getting a good job depends mainly on being in the right place at the right time.
- 21. a. The average citizen can have an influence in government decisions.
  - b. This world is run by the few people in power, and there is not much the little guy can do about it.
- 22. a. When I make plans, I am almost certain that I can make them work.
  - b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
- 23. a. There are certain people who are just no good.
  - b. There is some good in everybody.
- 24. a. In my case getting what I want has little or nothing to do with luck.
  - b. Many times we might just as well decide what to do by flipping a coin.
- 25. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
  - b. Getting people to do the right thing depends upon ability. Luck has little or nothing to do with it.



26. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
- b. By taking an active part in political and social affairs the people can control world events.
27. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
- b. There really is no such thing as "luck."
28. a. One should always be willing to admit mistakes.
- b. It is usually best to cover up one's mistakes.
29. a. It is hard to know whether or not a person really likes you.
- b. How many friends you have depends upon how nice a person you are.
30. a. In the long run the bad things that happen to us are balanced by the good ones.
- b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
31. a. With enough effort we can wipe out political corruption.
- b. It is difficult for people to have much control over the things politicians do in office.
32. a. Sometimes I can't understand how teachers arrive at the grades they give.
- b. There is a direct connection between how hard I study and the grades I get.
33. a. A good leader expects people to decide for themselves what they should do.
- b. A good leader makes it clear to everybody what their jobs are.
34. a. Many times I feel that I have little influence over the things that happen to me.
- b. It is impossible for me to believe that chance or luck plays an important role in my life.
35. a. People are lonely because they don't try to be friendly.
- b. There's not much use in trying too hard to please people, if they like you, they like you.
36. a. There is too much emphasis on athletics in high school.
- b. Team sports are an excellent way to build character.
37. a. What happens to me is my own doing.
- b. Sometimes I feel that I don't have enough control over the direction my life is taking.
38. a. Most of the time I can't understand why politicians behave the way they do.
- b. In the long run the people are responsible for bad government on a national as well as on a local level.

**INSTRUCTIONS:** As you read the following statements, please think about what you like or dislike when it comes to participating in a work-related training program. Then circle the number (1, 2, 3, 4, 5, 6, or 7) to the right of each item that most closely reflects your preference (like or dislike).

**1 – Strongly dislike    2 – Dislike    3 – Somewhat dislike  
4 – Neither like nor dislike    5 – Somewhat like    6 – Like    7 – Strongly like**

- |  |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|
| 39. Training programs in which I feel responsible for my own learning.....               | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 40. Training programs in which I set my own goals for learning.....                      | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 41. Training programs in which I have control over what is learned.....                  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 42. Training programs in which I have a role to play in directing my own learning.....   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 43. Training programs in which I make decisions about how my learning will progress..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**End of Self-direction in Adult Learning Questionnaire – Part 1**

**PLEASE NOTE:** Part 2 of this questionnaire will be sent to you via the email address you provided above.

**Thank you for your participation.**

## Unit 2 Online Questionnaire

**INSTRUCTIONS:** Please circle the number (1, 2, 3, 4, or 5) to the right of each item that most closely reflects your opinion about **the Continuing Education course you have just completed.**

**1 – Strongly disagree    2 – Disagree    3 – Neither agree nor disagree  
4 – Agree    5 – Strongly agree**

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 1. I had the opportunity to work with others to plan our learning. ....  | 1 | 2 | 3 | 4 | 5 |
| 2. Learners and instructors shared responsibility for planning the learning process. ....  | 1 | 2 | 3 | 4 | 5 |
| 3. Learners and instructors cooperated in planning the learning. ....  | 1 | 2 | 3 | 4 | 5 |
| 4. I collaborated with other learners in planning the learning/instruction. ....   | 1 | 2 | 3 | 4 | 5 |
| 5. I was helped to diagnose my learning needs. ....  | 1 | 2 | 3 | 4 | 5 |
| 6. I was helped to assess my weaknesses and identify my developmental needs. ....  | 1 | 2 | 3 | 4 | 5 |
| 7. I completed activities that helped me identify my learning needs. ....  | 1 | 2 | 3 | 4 | 5 |
| 8. As a part of this learning experience, I did some analysis to figure out the best direction for my learning and development. .... | 1 | 2 | 3 | 4 | 5 |
| 9. I had the opportunity to set my own learning objectives. ....   | 1 | 2 | 3 | 4 | 5 |
| 10. I had the opportunity to change learning objectives that did not meet my needs. ....   | 1 | 2 | 3 | 4 | 5 |
| 11. I made decisions that determined what I learned. ....  | 1 | 2 | 3 | 4 | 5 |
| 12. I made decisions about how my learning progressed. ....  | 1 | 2 | 3 | 4 | 5 |
| 13. I was able to choose topics I wanted to learn. ....  | 1 | 2 | 3 | 4 | 5 |

**INSTRUCTIONS:** Please circle the number (1, 2, 3, 4, or 5) to the right of each item that most closely reflects your opinion about **the Continuing Education course you have just completed.**

**1 – Very dissatisfied    2 – Dissatisfied    3 – Neither satisfied nor dissatisfied  
4 – Satisfied    5 – Very satisfied**

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 14. The course objectives were communicated to me in clear and understandable terms? .... | 1 | 2 | 3 | 4 | 5 |
| 15. The course objectives matched my ideas about what would be taught? ....               | 1 | 2 | 3 | 4 | 5 |
| 16. The content of the course was highly relevant to my job ....                          | 1 | 2 | 3 | 4 | 5 |
| 17. The course emphasized information that was most important for my work ...             | 1 | 2 | 3 | 4 | 5 |
| 18. This course prepared me to perform my current job tasks more effectively ...          | 1 | 2 | 3 | 4 | 5 |
| 19. This course prepared me to perform my job tasks ....                                  | 1 | 2 | 3 | 4 | 5 |

**INSTRUCTIONS:** Please circle the number (1, 2, 3, 4, or 5) to the right of each item that most closely reflects your opinion about training you have completed.

**1 – Strongly disagree    2 – Disagree    3 – Neither agree nor disagree  
4 – Agree    5 – Strongly agree**

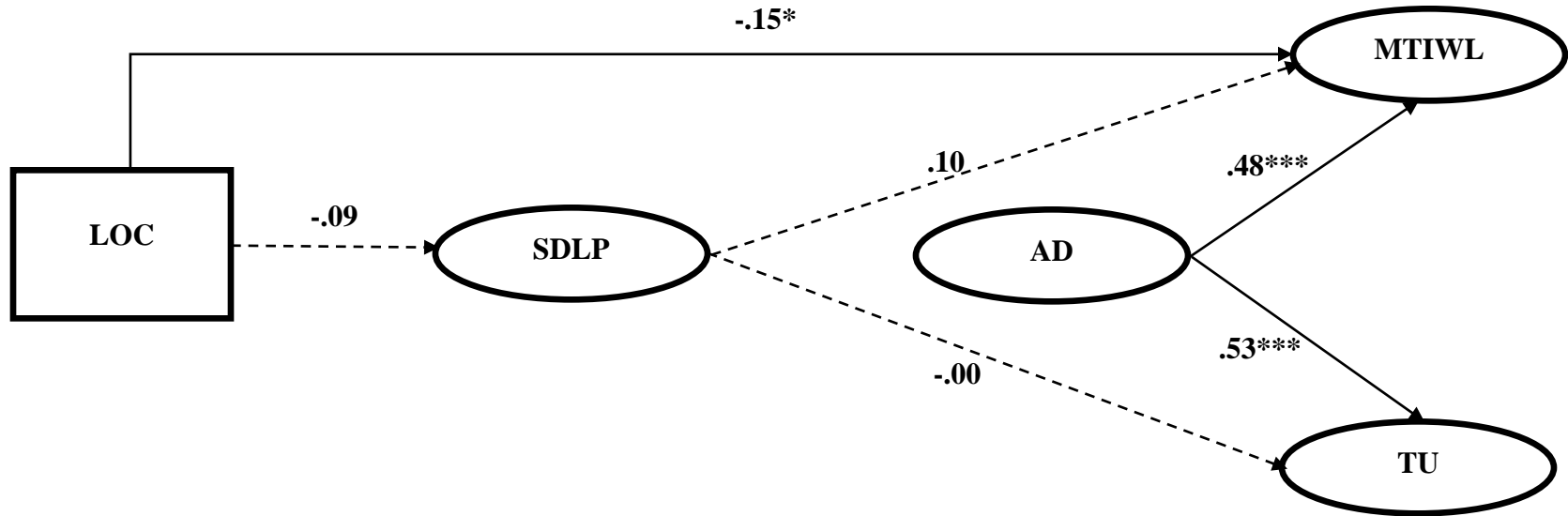
- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 20. I enjoy training programs that help me to develop knowledge and skills that will be useful to me in my work. ....    | 1 | 2 | 3 | 4 | 5 |
| 21. I believe training programs are important for my professional development. ....                                      | 1 | 2 | 3 | 4 | 5 |
| 22. I volunteer to participate in training programs. ....  | 1 | 2 | 3 | 4 | 5 |
| 23. As long as I get good raises or promotions, I do not care whether or not I participate in training. ....             | 1 | 2 | 3 | 4 | 5 |
| 24. I would rather not participate in training. ....   | 1 | 2 | 3 | 4 | 5 |
| 25. I come to training sessions unprepared. ....   | 1 | 2 | 3 | 4 | 5 |
| 26. I try hard not to miss any of the sessions during a training program. ....   | 1 | 2 | 3 | 4 | 5 |
| 27. I can easily find an excuse for not completing a training program assignment. ....                                   | 1 | 2 | 3 | 4 | 5 |
| 28. Training will increase my personal productivity. ....  | 1 | 2 | 3 | 4 | 5 |
| 29. When I leave training, I can't wait to get back to work to try what I have learned. ....                             | 1 | 2 | 3 | 4 | 5 |
| 30. I believe training will help me do my current job better. ....   | 1 | 2 | 3 | 4 | 5 |
| 31. I get excited when I think about trying to use my new learning on my job. ..   | 1 | 2 | 3 | 4 | 5 |
| 32. For the most part, the people in my organization who get rewarded are the ones that do something to deserve it. .... | 1 | 2 | 3 | 4 | 5 |
| 33. When I do things to improve my job performance, good things happen to me. ....                                       | 1 | 2 | 3 | 4 | 5 |
| 34. My job is ideal for someone who likes to get rewarded when they do something really good. ....                       | 1 | 2 | 3 | 4 | 5 |

**INSTRUCTIONS:** Please circle the number (1, 2, 3, 4, or 5) to the right of each item that indicates how true the statements are of you.

**1 – Untrue of me    2 – Somewhat untrue of me    3 – Neutral  
4 – Somewhat true of me    5 – True of me**

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 35. I am good at coming up with new ideas. .... | 1 | 2 | 3 | 4 | 5 |
| 36. I have a lot of good ideas. ....            | 1 | 2 | 3 | 4 | 5 |
| 37. I have a good imagination. ....             | 1 | 2 | 3 | 4 | 5 |

## APPENDIX E: Basic Structural Model

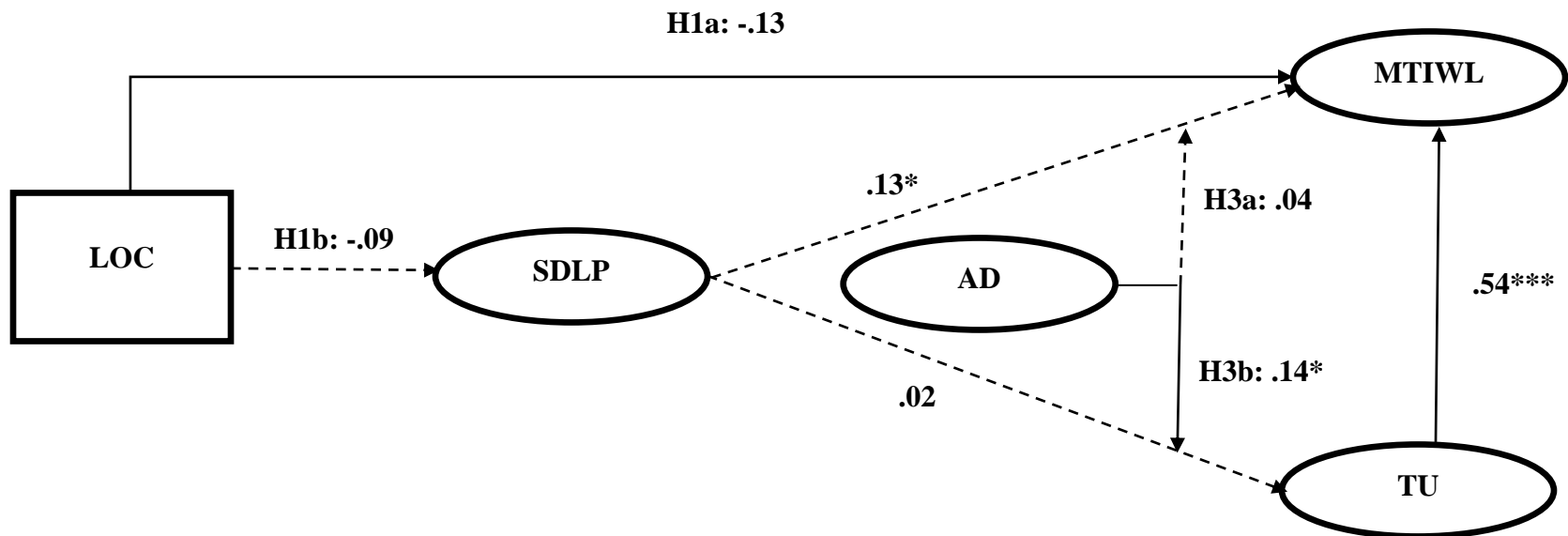


Note. LOC (locus of control), SDLP (self-directed learning preference), AD (andragogical design), MTIWL (motivation to improve work through learning, TU (training utility).

Standardized estimates shown

\*.  $p < .05$ , \*\*\*.  $p < .001$

## APPENDIX F: Interaction Structural Model

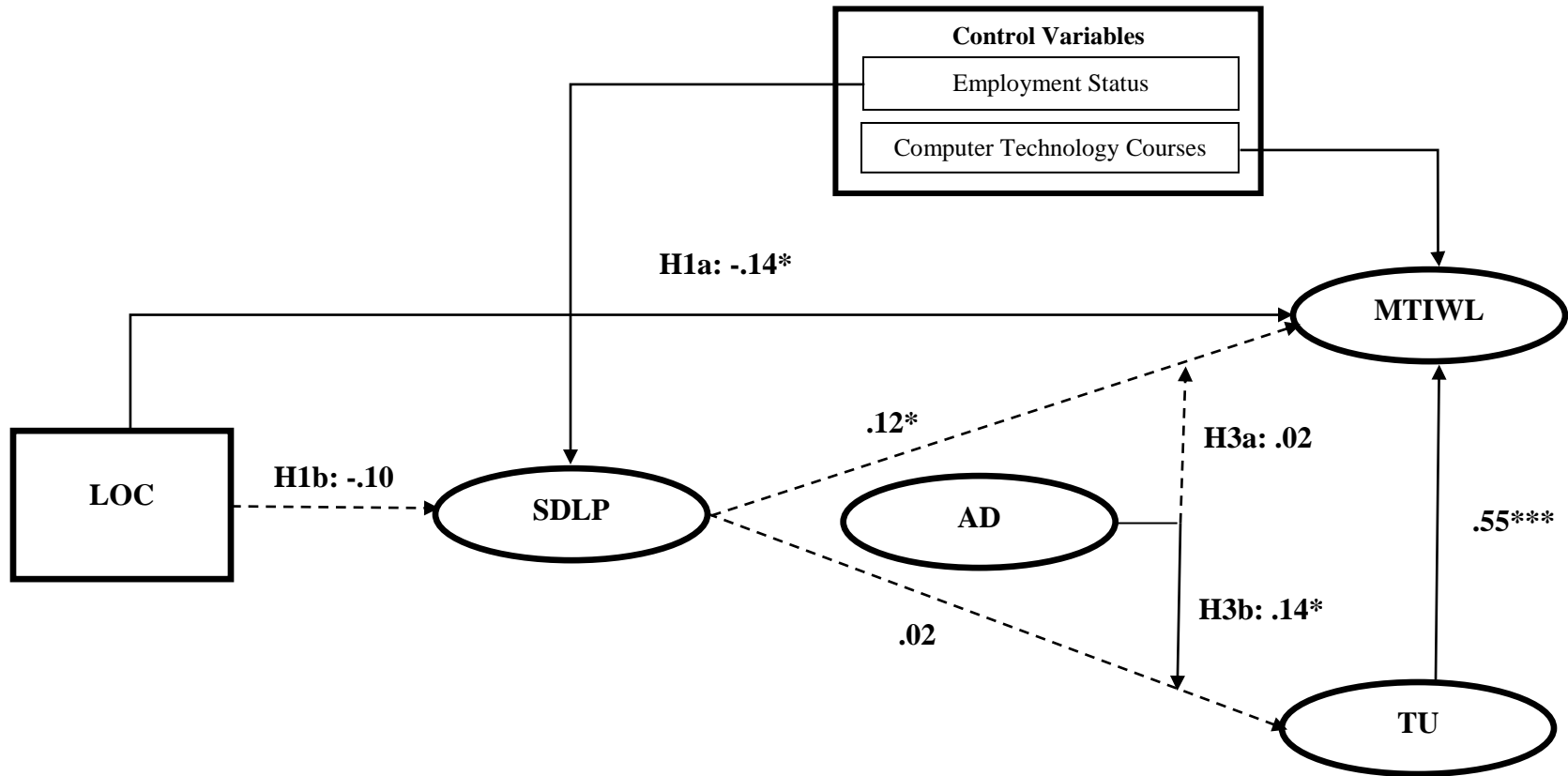


Note. LOC (locus of control), SDLP (self-directed learning preference), AD (andragogical design), MTIWL (motivation to improve work through learning, TU (training utility).

Standardized estimates shown

\*,  $p < .05$ , \*\*\*,  $p < .001$

## APPENDIX G: Complete Structural Model with Control Variables



Note. LOC (locus of control), SDLP (self-directed learning preference), AD (andragogical design), MTIWL (motivation to improve work through learning, TU (training utility).

Standardized estimates shown

Significant control variables included

\*,  $p < .05$ , \*\*\*,  $p < .00$

## APPENDIX H: Internal Review Board (IRB) Approval

### Application for Exemption from Institutional Oversight

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research projects using living humans as subjects, or samples, or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

Applicant, Please fill out the application in its entirety and include the completed application as well as parts A-F, listed below, when submitting to the IRB. Once the application is completed, please the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at <http://research.lsu.edu/CompliancePoliciesProcedures/InstitutionalReviewBoard/6283IRB%29/Item24737.html>

**LSU**  
Institutional Review Board  
Dr. Robert Mathews, Chair  
131 David Boyd Hall  
Baton Rouge, LA 70803  
P: 225.578.8692  
F: 225.578.5983  
[irb@lsu.edu](mailto:irb@lsu.edu)  
[lsu.edu/irb](http://lsu.edu/irb)

A Complete Application Includes All of the Following:

(A) A copy of this completed form and a copy of parts B thru F.

(B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)

(C) Copies of all instruments to be used.

\*If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.

(D) The consent form that you will use in the study (see part 3 for more information.)

(E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB. Training link: (<http://phrp.nihtraining.com/users/login.php>)

(F) IRB Security of Data Agreement: (<http://research.lsu.edu/files/Item26774.pdf>)

1) Principal Investigator: Nicole Cannonier

Rank: Doctoral Student

Dept: Sch. of Human Resource Ed. Ph: 225-302-4385

E-mail: nwame1@tigers.lsu.edu

2) Co Investigator(s): please include department, rank, phone and e-mail for each  
\*If student, please identify and name supervising professor in this space

Rald Bates  
Professor, School of Human Resource Education & Workforce Development  
225-578-2457, [rbates@lsu.edu](mailto:rbates@lsu.edu)

IRB E8368 LSU Proposal #

☒ Complete Application

☒ Human Subjects Training

☒ IRB Security of Data Agreement

3) Project Title: Dissertation - Self-direction in adult learning: Effect of locus of control and program design on learner motivation and training utility

Study Exempted By:  
Dr. Robert C. Mathews, Chairman  
Institutional Review Board  
Louisiana State University  
203 B-1 David Boyd Hall  
225-578-8692 | [www.lsu.edu/irb](http://www.lsu.edu/irb)

4) Proposal? (yes or no) NO If Yes, LSU Proposal Number                     

Also, if YES, either

☐ This application completely matches the scope of work in the grant

OR

☐ More IRB Applications will be filed later

5) Subject pool (e.g. Psychology students) Students, Continuing Education, Louisiana State University

\*Circle any "vulnerable populations" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature Nicole Cannonier Date 7/19/2013 (no per signatures)

\*\*I certify my responses are accurate and complete. If the project scope or design is later changes, I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Action: Exempted ☒ Not Exempted ☐ Category/Paragraph 1

Signed Consent Waived?: Yes ☐ No ☒

Reviewer Mathews Signature Robert Mathews Date 7/30/13



## VITA

Nicole Cannonier was born in St. Croix, United States Virgin Islands and raised with her brother by loving parents in St. Kitts, West Indies. In 2007, she earned a Bachelor of Science in Business Administration from the University of Louisiana at Lafayette. Nicole also received a Master of Public Administration from Louisiana State University in 2010. She was awarded the prestigious Louisiana Board of Regents/Southern Regional Education Board Graduate Fellowship over four years to pursue a doctoral degree in Human Resource Education with a concentration in Human Resource Leadership and Development under the guidance of Dr. Reid Bates. Nicole taught courses in leadership development, needs analysis, and human resource development during her doctoral program at LSU. She is actively involved in the Academy of Management and Academy of Human Resource Development as a presenter and reviewer. Her research interests include training transfer, instructional technology, effectiveness of training solutions, and cross-cultural management. She is co-author of a chapter published in *The Handbook for Human Resource Development* and has other articles forthcoming. Nicole has a practice background in workforce training within the commercial banking sector and has developed and delivered training in several Caribbean countries.