The Strength of Self: An Examination of Self-Directed Learning and Self-Regulated Learning Among Master’s Students

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I am submitting herewith a dissertation written by Holley Marie Linkous entitled "The Strength of Self: An Examination of Self-Directed Learning and Self-Regulated Learning Among Master’s Students." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Educational Psychology and Research.

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The Strength of Self: An Examination of Self-Directed Learning and Self-Regulated Learning Among Master’s Students

A Dissertation Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Holley Marie Linkous
December 2020
Dedication

To those who came before:
The Greene Legacy

And to those who follow:
Clara Eve and Charlotte Marie
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Abstract

There is a lack of understanding of the difference between self-directed learning and self-regulated learning. Though both theories have been found to be important learning processes for achieving learning goals, there is little evidence to identify how the two directly compare. Self-directed learning and self-regulated learning can both be defined as learning processes as well as a collection of characteristics of an individual (Brockett & Hiemstra, 1991; Efklides, 2011). There are metacognitive components to these learning processes (Saks & Leijen, 2014; Zimmerman & Moylan, 2009). It can benefit scholars to know how these two concepts within a structured, complex, high-demand, educational environment relate.

The purpose of this study was to examine the relationship between SDL and SRL among adult learners in master’s education. Participants (N = 105) were current master’s students enrolled in the colleges of Business, Social Work, and Education, Health, and Human Sciences. The students were asked to complete the PRO-SDLS (Stockdale, 2003) and the MSLQ (Pintrich, Smith, Garcia, & McKeachie, 1993), in addition to two demographic questions regarding age and gender.

Four research questions were analyzed using correlational tests, independent samples t-tests, and MANOVA. For this study, there was a significant positive correlation between the composite scores of the PRO-SDLS and the MSLQ ($r = .55, p < .05$). The coefficient of determination ($r^2 = .31$) indicated that 31% of the variance in participants’ SDL could be attributed to SRL. Nine factors on the MSLQ scale, more than half, showed some level of significant relationship with multiple factors of the PRO-SDLS. There were significant differences between genders in the PRO-SDLS factors of initiative ($t(103) = 2.07, p < .05$), control ($t(103) = -2.23, p < .05$), and self-efficacy ($t(103) = 2.37, p < .05$). There were significant
differences between genders in the MSLQ factors of elaboration $t(103) = -1.84, p < .05$,
metacognitive self-regulation $t(103) = -2.59, p < .05$, and effort regulation $t(103) = -3.49, p < .05$.

Implications for practice were suggested, such as development of master’s programs that encourage the opportunity to exercise SDL and SRL. Recommendations for further research are also discussed.
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Chapter One

Introduction to the Study

*Possunt, quia posse videntur*—Virgil, *Aeneid*, Book V, line 231

“They can because they think they can.” The empowerment that seeps through Virgil’s words is the driving force behind this inquiry into motivation and learning processes of master’s students. Belief in one’s own capabilities can be a strong foundation for goal achievement and the process in which those goals are determined (Bandura, 1977). The mental capacity to be disciplined, structured, and methodical in educational environments has been shown to positively impact learners in multiple ways, including the view of oneself (Zimmerman & Schunk, 2011). This sense of optimism encourages commitment to academic success (Santelmann, Stevens, & Martin, 2018). Researchers have found that students who have a high level of self-efficacy and outcome expectancy will likely work longer and more diligently than their peers with high self-doubt (Zimmerman, 2011). This mentality is connected to the personal environment a learner creates in which difficulties are seen as “challenges to be mastered rather than as threats to be avoided” (Pajares, 2008, p. 113).

Motivation and self-efficacy promote a positive learning experience. These two elements are key factors in the learning theories of self-directed learning (SDL) and self-regulated learning (SRL). As learners move through a variety of challenging educational experiences, these theories are activated in ways that promote confidence, identity development, and autonomy through the learning process (Bouchard, 2009; Hawkins, 2018; Hiemstra & Brockett, 2012; Joseph-Richard & Jessop, 2020; Lackéus, 2014; Mackay, 2017; Naude, van den Bergh, & Kruger, 2014).

Students pursuing a master’s degree are in an educational situation that poses challenges they have not encountered before. Traditionally, master’s students are expected to be agents of
personal knowledge, more independent learners than undergraduate students (Joseph-Richard & Jessop, 2020). As such, even a self-regulated or self-directed learner may struggle with applying strategies in unfamiliar learning events (Schraw, 2010). Intrinsic motivation can aid in continuous effort in these instances, as highly motivated students are often more persistent and less likely to be deterred from goal actualization (Augustyniak et al., 2016). Broad definitions of self-directed learning (SDL) and self-regulated learning (SRL) suggest the difference depends on the learner objectives being either learning-oriented or goal-oriented. The two learning experiences are foundationally similar, however. Possessing internal characteristics such as motivation (Seifert, Newbold, & Chapman, 2016) enables an individual to envision the means as well as the end in a strategic way.

Delineating the concept of self is highly important in evaluating SDL and SRL. Both learning processes hinge upon the term as the most inherent feature, but what must be stated is that “self” includes autonomous constructs as well as social constructs (Boucouvalas, 2009). For the purposes of this study, it is important to consider that movement through a master’s program exists in a social context. In other words, one’s learning process is impacted by other individuals, including other learners, facilitators, faculty, and other colleagues. Therefore, the positive psychology approach must expand to incorporate, to some degree, the level of effect from intergoal dynamics, an individual’s strategic effort in balancing ongoing goals (Cavallo & Fitzsimmons, 2012).

Much of SRL stems from social cognitive theory, which posits that the environmental context of learning determines at least some of the expectations for learning goals (Bandura, 1969), including the impact an individual may have on the group goal (Hadwin, Jarvela, & Miller, 2011). Self-regulation is situated within the realm of positive psychology, and Seligman
(2002) incorporated this factor in a list of character strengths. These character strengths should be highlighted, more so than any deficits, for an individual to live a fulfilled and happy life (Seligman, 1999). Wagener (2018) went so far as to say self-regulation is “a game-changer … of utmost importance” (p. 238) for academic success. Self-regulation and SRL can lead to successful completion of programs, an increased perception of learning, achievement in sports, and higher goal setting (Bandura & Jourden, 1991; Zimmerman, 2002).

Adult learning and development consistently take place in a social context, and this dimension forge a connection with social cognitive theory (Merriam & Bierema, 2013). SDL, as a critical construct of adult learning, is therefore developmentally social (Knowles, 1975; Merriam & Bierema, 2013). The self becomes interdependent with those in the situated learning context, thus creating an educational relationship (Brewer, 2016). The frameworks used for individuals are also able to be used for groups “without collapsing the adult quest for meaningful experience and relevance” (Boyer, 2003, p. 381).

This study focused on understanding how master’s students approach SDL and SRL strategies, with the intention to strengthen the fields of adult learning and positive psychology. Certain personality traits do impact a student’s tendency toward further education (Espíritu-Olmos & Sastre-Castillo, 2015), and confidence and self-efficacy within those educational programs can be heightened by inclusion of SDL and SRL techniques (Boyer, Edmondson, Artis, & Fleming, 2014). SRL requires that learner initiative go beyond autonomous learning to become a self-regulatory learning experience (Ponton, Schuette, & Confessore, 2009).

Additionally, further investigation into relationships of age and gender with learning processes is needed to maximize the creation of effective learning environments. Thus far, no definitive relationships have been determined regarding age or gender. Studies have shown SRL
strategies are better predictors of academic success than gender variables (Zimmerman & Martinez-Pons, 1986). Though inconsistent, reported gender differences often favor females (Pajares, 2002). In SDL, the inconsistencies among age and gender relationships have prompted researchers to question why the existing differences occur (Reio & Davis, 2005).

**Problem Statement**

There is a lack of understanding about the difference between self-directed learning and self-regulated learning. Though both theories have been found as important learning processes for achieving learning goals, there is little evidence to identify how the two directly compare. Differentiating SDL and SRL enables identification of effective learning processes and characteristics for individuals in academic endeavors. Despite these ill-defined differences, there is considerable literature calling for the use of self-direction and self-regulation in learning. Delineation in the terms addresses such suggestions and allows for accurate use in practice and research.

The choice to enter a master’s program comes with consideration of commitment and sacrifice. To even embark on this endeavor requires an in-depth admissions process, demonstrated capacity to write at an advanced level, the support of faculty members or other professionals, and passing of proficiency exams relative to the field. By surpassing these hurdles, students are presumed well-suited for advancement in education. However, master’s programs are fundamentally different than undergraduate programs (Sumprer & Walfish, 2011). Requirements of master’s students include expectations of analytical thinking, critical comparison, and easy adaptation to changes in a practical environment (Boote & Beile, 2005; Dixon, 1973).
Further, master’s academic work is held to a higher standard than undergraduate work. Despite these demands, a learner’s ability to demonstrate academic skill is driven by an internal locus of control unrelated to the teaching and guidance of faculty in the program (Boyer et al., 2014; Hannon, Collins, & Smith, 2005; Landrum, 2010; Otten, 1977). It is this formal learning structure in which grades tend to deviate from learning strategies. An example of this is found in results of testing in academics. Multiple choice exams lean largely on memorization and less on critical thinking. Students who are more adept at critical thinking, a practice highly valued in both SDL and SRL, may not score as high as students who are better at memorization, leading to “trivial correlations between academic performance in the class and critical thinking behaviors” (Credé & Phillips, 2011, p. 8).

Articulating how each process of learning occurs in the educational space allows clarification for situations in which the terms have been used interchangeably (Saks & Leijen, 2014). Many studies are situated around understanding undergraduate student experience of self-regulated learning (for example, Ainscough, Stewart, Colthorpe, & Zimbardi, 2018; Baird, Kniola, Lewis, & Fowler, 2015; Omoteso, 2012; Splan, Estepp, Porr, Broyles, & Velasco, 2017; Yusuf, 2011), but fewer are found regarding the master’s academic experience. Different approaches to learning in master’s programs include taking the view of faculty being mentors (Wright, 2015), asking for help, and communicating needs to an expert in the field available for guidance and successful progression through education (Burmeister et al., 2014; Newman, 2008; Su, 2016). The transition from seeing an instructor as the one in charge to more of a collegial relationship is not necessarily taught or verbalized but is crucial to the educational process (Hess & Sauser, 2011). The relationship can foster self-confidence and motivation (Schwartz & Holloway, 2012). Embracing the acts of help-seeking and relationship building with mentors has
been linked with self-directed learning (Boyer, et al., 2014; Guglielmino & Hilliard, 2007; Knowles, 1975) and self-regulated learning (Nesbit, 2012; Pintrich, Marx, & Boyle, 1993; Schraw, 2010).

**Purpose Statement**

The purpose of this study was to examine the relationship between SDL and SRL among adult learners in master’s education. An analysis of this relationship contributes to the body of knowledge that bridges the gap between self-directed and self-regulated learning and builds on information pertaining to self-guided learning techniques of master’s students. The results also provide a practical illustration of two similar areas of study.

The transition from a passive role as a student into an active contributor is a unique experience for each learner (Kasworm, 2011; McCarthy, 2013). The individual’s way of learning changes in response to a demand for “higher-quality, more innovative research” (Lovitts, 2005, p. 141). In these environments, students often face new learning formats, study habits, and other unspoken expectations with which they are unfamiliar.

This study focused on two key components in the learning processes of master’s students by looking at SDL and SRL. SDL and SRL can both be defined as a learning process as well as a collection of characteristics of an individual (Brockett & Hiemstra, 1991; Efklides, 2011). There are metacognitive components to these learning processes (Saks & Leijen, 2014; Zimmerman & Moylan, 2009). It can benefit scholars to know how these two concepts occur within a structured, complex, high-demand, educational environment.

**Research Questions**

The research questions that guided this study were:
1. Is there a significant relationship between self-directed learning and self-regulated learning in current master’s students?

2. Are there significant relationships between the four factors of self-directed learning and 15 factors of self-regulated learning?

3. Is there a significant relationship between self-directed learning, age, and gender?

4. Is there a significant relationship between self-regulated learning, age, and gender?

Theoretical Framework

To set the stage for this study, two empirical constructs from different fields provide guidance. From the field of adult education, SDL frames part of the research regarding inquiry into an individual’s approach to learning processes. The second lens, SRL, falls under the umbrella of self-regulation in positive psychology. Next, I provide an overview of each of these theories, models, and instruments.

Self-Directed Learning Framework: Theory and Model

Decades of research support the acceptance of SDL as legitimate and the “most natural way to learn” (Guglielmino, 2008, p. 2). Initially studied as a learning process (Grow, 1991; Knowles, 1975), it has additionally been investigated as an internal factor manifesting in ways that are able to be quantitatively measured (Brockett, 1985). Therefore, the broadest understanding of self-directed learning can be explained as the intentional acts of initiation, implementation, and evaluation in learning processes, combined with learner characteristics, including self-efficacy and motivation, in a social context (Hiemstra & Brockett, 2012; Ruttencutter, 2018; Stockdale, 2003; Stockdale & Brockett, 2011).

Hiemstra and Brockett (2012) adapted their original PRO model into the Person, Process, Context (PPC) model. This model is a guide for recognizing how individuals use SDL in
educational pursuit. Person, process, and context are categories within the individual-initiated learning experience. The *person* construct determines the characteristics found within the learner in a learning experience. Some examples of individual characteristics include self-concept, resilience, and grit (Hiemstra & Brockett, 2012; Ruttencutter, 2018). This construct accounts for the adaptability of certain learner characteristics in various learning environments. The element of the *process* refers to the aspects of the teaching-learning transaction, such as learning style, skill level of technology use, and organization and planning (Hiemstra & Brockett, 2012). The person and process elements are situated in the *social context*, which is the third component needed for the SDL process. The social context is composed of the physical and mental space a learner occupies, accounting for constructs such as biases, power, and politics. These three equal components overlap to contribute to the SDL experience that is unique to the learner. The PPC model suggests a cyclical experience in which each element plays a key role, though one element may have more weight than another (Hiemstra & Brockett, 2012). According to the authors, this model supports the instrument to be used in this study, the PRO-SDLS (Stockdale, 2003).

**Positive Psychology, Self-Regulation, and Self-Regulated Learning: Theories and Model**

Positive psychology is a scientific investigation into authentic happiness (Seligman, 2002). Seligman (1999) called for psychologists to enhance and understand individual characteristics of a more positive nature, reimagining the standard approach to the science of psychology. Essentially, this call launched a field of study that emphasized the mentality that overall, life is good, and the well-being of others impacts the happiness of an individual (Myers, 1992; Peterson, 2006). According to Seligman (2002), each person possesses a unique set of character strengths, and “the highest success in living and the deepest emotional satisfaction comes from building and using your signature strengths” (p. 13). Self-regulation, a strength
associated with the virtue of temperance, is one of 24 signature strengths used in positive psychology to better understand the pursuit of the good things in life (Seligman, 2002).

Self-regulation is a process of behavior alteration in social and situational experiences (Baumeister & Vohs, 2007). This concept is primarily composed of self-control and linked to motivation, cognition, and self-knowledge (Hofer, Yu, & Pintrich, 1998). Self-regulation is a broad term often meaning, simply, control (Moskowitz, 2012), or “being disciplined” (Peterson, 2006, p. 144). As Pintrich (2000) has contributed greatly to the conceptual understanding of self-regulation as well as SRL, his framework, known as the motivation-based SRL model, guided this study and provided the foundation of the instrument to be used. The instrument’s emphasis is focused on understanding “the interplay between motivation and cognition” (Duncan & McKeachie, 2005, p. 117).

In learning instances, self-regulation transpires in the way of developing a system “oriented toward the attainment of personal goals” (Zimmerman & Schunk, 2011, p. 1). Self-regulation is seen as cyclical (Schunk, Meece, & Pintrich, 2014; Zimmerman, 1998, 2000), but goal attainment is seen as more of a linear rotation (Shah, Hall, & Leander, 2009) and consists of three principles: recursivity, resources, and resolutions (Shah & Gardner, 2008). As such, self-regulated learning combines the foundational understanding of self-regulation, then applies it to the learning transaction.

To narrow down the construct of self-regulation, this study focused on SRL. This concept of learning falls into the positive psychology strength of self-regulation (Peterson & Seligman, 2004). There are many external factors that can influence learning by an individual, but SRL concentrates on understanding the internal actions such as “monitoring, controlling, and regulating cognition and monitoring, controlling, and regulating other factors that can influence
learning such as motivation, volition, effort, and the self-system” (Pintrich, Wolters, & Baxter, 2000, p. 45). I use Zimmerman’s (2002) definition of SRL as “the self-directive process by which learners transform their mental abilities into academic skills” (p. 65).

**Significance of the Study**

This study examined SRL and SDL strategies and characteristics of master’s students in education, health, and human sciences, social work, and business. By doing so, this study is significant in multiple ways. First, it provides information on the direct relationships of SRL and SDL. On a broader scale, the study is an addition to the existing body of research on connections among SDL and character strengths in positive psychology (Beeler, 2018; Dieffenderfer, 2014; Ruttencutter, 2018; Stockdale, 2003; Vess, 2015). Third, results of this study encourage adaptability in practice for facilitators of adult learners according to learning strategies, such as goal setting and time management. Finally, this study contributes to further understanding how SDL transpires in adult education, specifically master’s programs.

Unique to these learning concepts is an underlying degree of faith, specifically in oneself (Rachlin, 2000). This self-concept manifests in the ability to try and try again, and the belief that an individual can reach goals, regardless of any evidence to the contrary. Referring again to Virgil, those who can are those who believe they are able. This is the crux of motivation and self-efficacy. The occurrence of SRL and SDL in master’s students is therefore linked to faith in themselves. That is where these measurement tools are opening doors and providing a bit of transparency to an internal learning event.

In developing the literature review for this study, a substantial amount of research was found that focused on K-12 and undergraduate students (e.g., Dynan, Cate, & Rhee, 2008; Schunk, 2008; Zimmerman, 2008), with less focus on how master’s students approach SRL. This
study examined SRL and SDL strategies of master’s students in education, health, and human sciences, social work, and business.

Assumptions

I held certain assumptions about what I expected to encounter with the participants, the measurement tools, and the analysis performed. Some scholars have questioned the validity of answers obtained through methods of self-report. However, I assumed that participants would answer all survey questions correctly, completely, and honestly, on all three sections: the demographic survey, the PRO-SDLS, and the MSLQ. I assumed the instruments I used would capture the data I needed for this study. I also assumed that a quantitative analysis of the data would be sufficient and representative of any relationships that may exist between SRL and SDL.

Limitations

While I sought to control as many of the variables as possible to provide a generalizable outcome, there were some constraints to consider. First, the study sample was obtained through convenience. This was a volunteer-based survey disbursed through email. Inherent in this style of survey is potential for sample bias of who volunteers to participate and what voices are heard. Second, learning processes, including SDL and SRL, are constantly evolving based on individual experiences and situations; therefore, one instrument is not capable of capturing all behaviors and strategies (Schraw, 2010).

Delimitations

The delimitations for this study are defined by the following three guidelines. First, I surveyed only master’s students in the Colleges of Education, Health, and Human Sciences, Social Work, and Business. Second, I used a quantitative methodology via survey research.
Third, this study was limited to one period of time in which the data were gathered; therefore, it was not a longitudinal study.

**Definitions**

The following key terms are used frequently in this study:

*Self-directedness*: Self-directedness, or learner self-direction, refers to an individual’s internal learning and growth process as well as the external influences experienced through instruction (Brockett & Hiemstra, 1991).

*Self-directed learning*: Self-directed learning is defined as both a process of learning in which the individual establishes elements of control over their own learning, and characteristics of learners including self-efficacy and motivation (Brockett & Hiemstra, 1991; Hiemstra & Brockett, 2012; Ruttencutter, 2018; Stockdale, 2003).

*Self-regulation*: Self-regulation is a mental state and process in which individuals focus on goal attainment, including control over feelings and thoughts, and being proactive and reflective about self-monitoring (Baumeister & Vohs, 2007; Peterson, 2006; Zimmerman, 2000).

*Self-regulated learning*: SRL is a process of learning that is self-directed in nature, employing tenants of forethought, monitoring, control, and reaction in a learning transaction (Baumeister & Vohs, 2007; Panadero, 2017; Pintrich, 2000).

**Overview of the Study**

The purpose of this study was to examine the relationship between SDL and SRL among adult learners in master’s education. By adding to existing data on connections between characteristics of SDL and positive psychology, this study contributes to more understanding about the characteristics and learning processes of master’s students. Chapter One provided the outline of the study, including purpose and problem statements, significance of the study, and
research questions. The theoretical frameworks were also discussed before moving into assumptions, delimitations, limitations, and definitions. Chapter Two provides a comprehensive analysis of literature on SDL, SRL, and master’s students’ learning processes. Chapter Three presents the research design and method, including the study population, samples, instruments used, and data analysis process. In Chapter Four, I discuss the results of the data analysis procedures, including the demographic scale and correlations that speak to the research questions. Chapter Five presents the discussion and interpretation of results as well as implications for future research and practice.
Chapter Two

Literature Review

As stated in Chapter One, the purpose of this study was to examine the relationship between SDL and SRL among adult learners in master’s education. Chapter Two provides the conceptual and theoretical approaches to these fields. First, I provide a brief overview of positive psychology before moving on to self-regulation, the construct in which SRL is grounded. This section provides the foundation of the guiding theories as well as the four components of self-regulation. Next, I move to the development of SRL, including an intricate look at six models situated within four basic domains of learning and performance. This section also examines the variety of instruments used to measure SRL, findings of SRL studies, and criticism of the theory. Then, I examine the development of SDL as a process and defining characteristics, models of SDL, and instruments most often used in SDL measurement. Finally, I illustrate the connections between SDL and SRL before concluding the chapter.

Positive Psychology

Underpinnings of positive psychology have existed in theories since long before the concept was solidified by its forefathers, Martin Seligman and Chris Peterson. Maslow (1954) used the phrase, though in a slightly different context. Since that time, the field of psychology harbored theories that danced around the topic without explicitly delving in. However, in 1998, Seligman, the newly elected president, set forth challenges to the American Psychological Association to embark on more scientific investigations of the positive side of life (Seligman, 1999). Peterson (2006) clarified that while the predominant psychological concern of human problems is important and should not be abandoned, the study of psychology “is incomplete,” which therefore “demands a sea of change in perspective” (p. 5). Positive psychologists would
assist individuals and communities in surviving and flourishing (Seligman & Csikszentmihalyi, 2000).

The three pillars of positive psychology are the study of positive subject states, positive psychological traits, and positive institutions. These pillars translate as three different levels: subjective, individual, and group or community (Boniwell, 2012). According to Peterson (2006), the theory of positive psychology is essentially the following dynamic: “Positive institutions facilitate the development and display of positive traits, which in turn facilitate positive subjective experiences” (p. 20).

Since Seligman’s (1999) call to arms on this subject, throngs of psychologists answered from fields such as social psychology, organizational psychology, and educational psychology (Anderson & Brockett, 2008; Peterson, 2006). New approaches to the field broadened understanding of positive psychology, developing a second wave that embraced “an engagement with the ‘darker side’ of life” (Ivtzan, Lomas, Hefferon, & Worth, 2016, p. 2).

Seligman and Peterson formed a taskforce to search for ubiquitous virtues upon which to establish a “taxonomy of good character” (Seligman, 2002, p. 130). The result was a culmination of six virtues, endorsed by numerous traditions worldwide and over thousands of years: wisdom and knowledge, courage, love and humanity, justice, temperance, spirituality, and transcendence. Each of these virtues can be achieved through various practices of an individual, which are referred to as character strengths (Peterson, 2006; Seligman, 2002). To further understand the development and classification of these strengths, the Values In Action (VIA) Institute was founded. The VIA Institute is a nonprofit organization focused on creating a knowledge base built off scientific investigation into the understanding of human character (Peterson & Seligman, 2004).
The virtue of temperance refers to characteristics that protect humans from excess and allow observation of “what a person refrains from doing” (Peterson, 2006, p. 144). The strengths that fall under this virtue include forgiveness/mercy, modesty/humility, prudence, and self-regulation. These strengths are promoted less in the United States than other cultures but are important in the quest for a good life (Peterson, 2006). The investigation into self-regulation as a character strength promotes many positive consequences such as academic success, personal adjustment, impulse control, and “[strength of] self in times of stress” (Peterson & Seligman, 2004, p. 513).

**Self-Regulation Theory**

Self-regulation theory (SRT) is a byproduct of Bandura’s social cognitive theory. SRT is a theoretical framework developed to assist in understanding how individuals regulate behavior in a goal-oriented way (Bandura, 1991). This theory argues that interaction is driven by “triadic reciprocal determinism” (Bandura, 1986, p. 23). This interaction is influenced by three constructs: personal interaction, environment, and behavior. SRT challenges the blind acceptance of studies focusing on a singular cause of behavior, suggesting instead that three factors work in conjunction to determine an individual’s reaction to a given experience in a certain context (Bandura, 1986).

Within this interaction, self-regulation is manifested through certain “subfunctions that must be developed and mobilized for self-directed change” (Bandura, 1986, p. 336). These subfunctions include self-observation, self-monitoring, self-reflecting, and self-diagnosing (Bandura, 1986). Though seen as an “elusive construct” (Zimmerman, 2011, p. 49), there is considerable literature to outline the main components of self-regulation.
Components of Self-Regulation Theory

More recently, Baumeister and Vohs’ (2007) work outlined four basic components required for self-regulation in action. The first of these factors is the creation of a determining standard. This standard sets the baseline for individual growth, control, and desire. This standard establishes the importance of clarity, as ambiguity and undefined standards can hinder the self-regulation process (Baumeister & Vohs, 2007).

Monitoring is the second component of self-regulation. Determining an effective standard involves monitoring. To know if an action works, an individual must be aware of it. After evaluating one’s behavior or action against the standard, an individual may decide whether to modify the behavior or the standard in some way (Baumeister & Vohs, 2007).

The third component of self-regulation, willpower, is strength embedded in self-control. Willpower is a finite resource that can essentially run out, which can lead to ego depletion (Baumeister & Vohs, 2007, Vohs & Baumeister, 2004). There are biological aspects to this energy exchange as blood glucose is physically used as fuel. Essentially, a person can run out of energy over time if they are unable to replenish or unaware of it after completing acts of self-control (Gailliot et al., 2007).

The fourth component of self-regulation is motivation. While the original works of Baumeister, Heatherton, and Tice (1994) focused on the previous three factors, further investigation determined that motivation is a key concept in the mix of behaviors for self-regulatory action (Baumeister & Vohs, 2007). Some researchers support the claim that motivation occurs before self-regulation transpires (Zimmerman & Schunk, 2008). Motivation is not fixed, but variable in any given context.
Motivation can manifest as an internal or external driver, or both. Help seeking can be perceived as social through the interaction and engagement with others in goal attainment. However, this action also has a connection to nonsocial strategies of academic attainment (Zimmerman & Schunk, 2008). The perception of success in one’s own learning strategies encourages persistence. Self-direction in self-regulated learning is often inspired by a flexible view of intelligence, as this belief provides the learner a sense of self-efficacy when adapting learning processes (Dweck & Master, 2008; Hidi & Ainley, 2008; Zimmerman & Schunk, 2011).

The four components of SRT give a basis to self-regulated learning models. These components are setting a standard, monitoring, willpower, and motivation. These factors are helpful to understanding concepts of SRL. The following models of self-regulated learning demonstrate how this theory exists in learning spaces. After outlining the basic domains in which SRL occurs, the section overviews the six most-used models constructed by scholars over time as understanding of this concept has evolved.

**Self-Regulated Learning Models**

Self-regulated learning is an integrated analysis of students’ self-regulatory processes in learning (Zimmerman & Schunk, 2011). Studies delineate findings among the following processes: cognitive/metacognitive, developmental/behavioral, motivational, and social/environmental (Panadero, 2017; Zimmerman & Schunk, 2011). These four domains have set research perspectives of scholars over the development of the field to best understand how learning and performance transpire in each category. The following comparison examines how each domain affects each theory and model. All the models provide similar but unique perspectives on studying self-regulated learning theory within the four domains, with different
emphases and compositions (Wolters, Benzon, & Arroyo-Giner, 2011). Pintrich’s (2000) framework of SRL and motivation gives the most relevant model for the current study.

Research surrounding SRL has moved from a focus on cognitive processes to a multidimensional consideration of where, why, and how some learners employ self-regulation in their learning experiences, while others do not (Zimmerman, 2011). This section is not inclusive of all SRL models but does provide a brief overview of commonly used theories.

**Socio-Cognitive SRL Models**

Inclusion of social impact on learning can be traced to the creation of SRL. Social cognitive theory laid the foundation for the three models created by Zimmerman (1989, 2000, 2009). These models are called Triadic Analysis, Cyclical Phases, and Multilevel.

**Triadic Analysis.** Zimmerman’s (1989) Triadic Analysis model of SRL is closely aligned with Bandura’s (1986) triadic model of social cognitive theory, focusing on connections among personal characteristics, behavior, and environment. This model was adapted over time, depicting more illustrations of subprocesses, and evolved into the Cyclical Phases model (Zimmerman & Campillo, 2003). While the subprocesses were incorporated to the theoretical framework from the beginning, the figure provided by Zimmerman (2000) in the SRL handbook did not include them until later. The Cyclical Phases approach of SRL moved into a multilevel model. This model contains four stages of SRL a learner experiences in the self-regulated learning process.

**Cyclical Phases.** Adapted from the original Triadic Analysis model, Zimmerman and Moylan’s (2009) Cyclical Phases model further detailed the three phases of self-regulated learning. The first phase is called the forethought phase, the second is the performance phase, and the third phase centers on self-reflection. Each phase contains subsections, as the learner
moves through certain activities in their learning pursuit, including goal setting, monitoring, and self-evaluation (Zimmerman & Moylan, 2009). This model illustrated how metacognition and motivation interact to foster learning process development.

**Multilevel.** The four levels of the multilevel model are observation, emulation, self-control, and self-regulation (Zimmerman, 2000). In this model, a description of each level supports the behaviors of a learner as they become more self-regulated in their learning. The model also highlights the difference between having self-control and self-regulation. According to Zimmerman (2000), self-control is adhering to an externally defined structure in an ideal environment, while self-regulation is the ability to adapt the structure of self-control in various social contexts.

**Cognitive and Metacognitive SRL Models**

In this section, an examination of Winne’s (1997) SRL model follows the discussion of two models from Boekarts. With an extensive amount of mental activity taking place implicitly, the metacognitive approach includes appreciation of the concept that SRL may “run by itself” (Winne, 2011, p. 19). The model provides an understanding of planning, executing, and evaluating tasks in pursuit of goal-driven behavior (Winne, 2011). This section, overviewing cognitive and metacognitive models, concludes with an overview of Efklides’ (2011) MARSL model before moving into social and environmental based models of SRL.

Another pioneer in the SRL field, Boekaerts (1991) introduced her first SRL model as a structural system with six components based on two fundamental constructs: cognitive and motivational self-regulation. Building on those six components, but further incorporating an interactional effect, she created the Adaptive Learning model that evolved into the Dual Processing Model. Understanding the “why” regarding self-regulation allows researchers to
assign more context to the processes involved in individual behavior. Boekaerts (2011) determined three purposes of this transaction. These purposes, the driving force of her second model, may be task-focused, self-focused, or out of personal protection.

**Structural model.** Boekaerts’ (1996) structural model provided an interconnected look at the two sides of self-regulation in learning with a detailed and segmented layout. The cognitive segment of the model described content domain, cognitive strategies, and cognitive regulatory strategies. The same is explained of motivation in learning, as this segment considered metacognitive and motivational impact, motivation strategies, and motivational regulatory strategies. The connection of each category within the model implies multidirectional interaction is acceptable and expected.

**Adaptive Learning/Dual Processing model.** In this approach, the terms “top-down” and “bottom-up” describe the learning transaction. These models were designed to mirror learner perspectives of the tasks at hand based on individual goals and values (Boekaerts & Cascallar, 2006). The learner’s emotional regulation then shapes further investigations (Boekaerts, 2011). An example of the “top-down” learning strategy could be when a learner sees a learning opportunity as in alignment with personal abilities or needs, possesses a growth mindset, and is driven by an internal motivation to succeed. The “bottom-up” approach occurs when the process is a negative or fear-based learning strategy in attempt to protect a learner’s well-being, whether from external or internal detrimental pressure. A third scenario occurs when the learner attempts to move from the “bottom-up” path to the “top-down” path (Boekaerts, 2011).

**Winne’s SRL model.** Winne and Hadwin (2008) created a model in which self-regulation in learning moves through four phases of metacognitive adaptation including learning processes, studying, and task and goal setting. Each of these SRL phases is grounded in mental
control and metacognitive monitoring (Azevedo, Johnson, Chauncey, & Graesser, 2011). This model is highly focused on metacognitive aspects within the SRL experience. In addition to this model, Winne established the COPES technique, which delineated five components of cognitive processing in four phases of SRL (Winne, 1997, 2011; Winne & Hawin, 1998). The acronym COPES stands for Conditions, Operations, Products, Evaluations, Standards, and the four phases include definition of task, goals and plans, study tactics, and adaptations (Winne & Hadwin, 1998). While this model focuses predominantly on metacognition, it does not discount the importance of motivation in SRL.

**MARSL.** Another model that strongly emphasizes metacognition in SRL is the Metacognitive and Affective Model of Self-Regulated Learning (MARSL) (Efklides, 2011). This model is influenced by work from Zimmerman, Winne, and Hadwin, and Pintrich (Panadero, 2017). This dual-level model provides a macro and micro analysis of the interactions among motivation, cognition, and emotional regulation in SRL (Efklides, 2011).

**Social- and Environmental-based SRL Models**

The newest approaches to SRL incorporate more emphasis on shared and social interaction with learning processes (Hadwin et al., 2011). According to the socially shared regulation of learning (SSRL) theory, co-created learning environments, regulatory processes, and syntheses of strategies move like-minded individuals in one space toward a mutually beneficial learning result (Hadwin et al., 2011).

**Socially shared regulation of learning.** Expanding upon Hadwin’s work with Winne (for example, Winne & Hadwin, 1998, 2008), empirical evidence to support the SSRL model is traced back to the early 2000s. SSRL is a large-scale investigation on how SRL takes place in co-constructed learning processes and is not designed to consider individual learning experiences
This model examines learning processed through four phases, or feedback loops, in which a group moves through the planning, executing, and evaluating steps as one entity.

**Pintrich’s Motivation-based SRL Model**

Motivation is a cognitive construct identified as one of the main tenets of SRL (Zimmerman & Schunk, 2011). Motivation is defined as “the process whereby goal-directed activities are instigated and sustained” (Schunk et al., 2014, p. 5). This phrase explains how motivation exists in learning. In being goal-driven, motivation attends to the needs and desires of an individual. As an activity-based practice, motivation exhibits purposeful and intentional actions. Instigation suggests that a learner must take initiative in individual learning practices, and sustainment indicates a high level of commitment (Schunk et al., 2014).

There are many theories of motivation, stemming from a cognitive approach and leading into learning environmental explorations. The approaches range from behavioral to humanistic, but for the purposes of a succinct connection to this study, Pintrich’s defining work on motivation and SRL (see Pintrich, Marx, & Boyle, 1993) is the framework provided. Accordingly, this initial investigation into motivation in a classroom laid a foundation for understanding two avenues of goal orientation (mastery or performance orientation) that led to an expanded understanding of conceptual change (Pintrich, Marx et al., 1993). Regulation of motivation can impact the processes of other concepts (Wolters et al., 2011). Incorporated in this framework is the traditional approach-avoidance foci, promoting further investigation into motivation in learning and classroom settings.

Pintrich’s (2000) motivational approach to SRL consists of four phases, each phase with four areas for regulation. The phases are 1) forethought, planning, and activation; 2) monitoring;
3) control; and 4) reaction and reflection, while the areas for regulation consist of a) cognition, b) motivation/affect, c) behavior, and d) context (Pintrich, 2000, p. 454). The following definition of SRL is the guiding principle behind the model: “It is an active, constructive process whereby learners set goals for their learning and the attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment” (Pintrich, 2000, p. 453). The model does not indicate a particular order and allows for a fluid relationship among the areas and phases.

The first three areas of the framework are personal constructs utilized by an individual, typically processed through a self-regulatory mental analysis. A person can attempt to exhibit self-control over cognitive processes, motivational factors, and behavior (Pintrich, 2000). This is the case for each of the four phases that transpires in SRL. The fourth area, context, is less personally controlled and may externally impact the learning process in either a restrictive or encouraging way (Pintrich, 2000). These intersections can occur simultaneously, independently, or collaboratively with another, without hindering the SRL process in any way.

Self-efficacy and goal orientation are instrumental in the initial phase of SRL. This process yields understanding of how motivation impacts the phase of forethought, planning, and activation (Pintrich, 2000). One begins with an evaluation of whether goals are achievable, potential challenges in the pursuit of the goals, and personal interest in the tasks ahead.

The second phase of this SRL model is monitoring. Motivation and monitoring interact as the learner awareness increases and considers how the facets can be regulated for goal attainment purposes (Pintrich, 2000). Whether this awareness consists of attempting to raise one’s self-efficacy in the learning area or taking steps to improve the monitoring of metacognitive thought processes, the interaction becomes a way that the learner stays accountable.
The third phase is control and regulation. Control and motivation in SRL may transpire through self-affirmation, emotional control, or possibly defensive pessimism (Pintrich, 2000). Intrinsic and extrinsic motivation in this phase can be controlled and regulated through good grades or favorite activities of interests as rewards. Adaptation may occur as needed based on a determination of an effective personal strategy.

Reaction and reflection, the fourth phase, combine with motivation that moves the learner beyond the learning situation. Progress is evaluated and judgements are made based on personal intelligence, commitment, and self-efficacy attributed to the learning experience. Attribution theory purports that learners are capable of making intentional and rational decisions about their learning experience, whether through reflection and reaction that exhibit some emotional condition (Pintrich, 2000; Weiner, 1986, 1992).

A distinguishing aspect of this model is the incorporation of an area of regulation focusing on attempts at controlling the personal self and overt behavior. Influenced substantially by social cognitive theory, this model portrays behavior as a personal characteristic that an individual can observe, monitor, regulate, and potentially adapt (Pintrich, 2000). Regulation of behavior in practice includes time management, adjusting effort levels, and persistence. In the reaction phase, “the main behavior is choice” (Pintrich, 2000, p. 469).

Three areas of regulation (cognition, motivation, and context) are frequently found in SRL models and theories. Pintrich’s (2000) analysis of these areas takes place through a lens of goal orientation. Whether a learner is approaching an educational environment with a task-centered or a purpose-centered approach often determines how the goals ultimately manifest. Through this framework, researchers can classify SRL strategies as specific or general by asking why, how, and what about motivation factors. Additionally, analyzing tactical and strategical
control exhibited by learners can show various levels of intentionality, focus, and commitment in learning strategies (Pintrich Marx et al., 1993).

**Measuring SRL**

Techniques of measuring vary in SRL. These techniques range from interviews to surveys, observations to self-report. The focus depends on the theoretical approach behind the instruments. The most common include the Self-Regulated Learning Interview Schedule (SRLIS) (Zimmerman & Martinez-Pons, 1986, 1988), On-line Motivation Questionnaire (OMQ) (Boekaerts, 1999), and the Motivated Strategies of Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1993). These three instruments are discussed in this section.

These tools have yielded secondary investigation into relationships by gender. One study found that females scored significantly higher in test anxiety, and lower in motivation and self-efficacy (Boyer & Usinger, 2015). Similarly, another study found that overall motivation scores of females were slightly lower, and self-efficacy scores were significantly lower (Doubé & Lang, 2012). Pajares (2002) compared scores in children by gender and suggested that there is less difference when students are “at the same level of academic competence” (p. 118).

**Self-Regulated Learning Interview Schedule (SRLIS)**

Zimmerman and Martinez-Pons (1988) conducted interviews with high school students. The study was the determining procedure that led to the development of the SRLIS. These interviews provided information on strategies used by students in academic settings for goal attainment. The researchers created multiple hypothetical learning situations and asked students what approaches would be used in those environments.

The researchers developed structured interview questions about six learning atmospheres. The researcher then asked students about any methods used in situations of low motivation,
challenging problems, and various physical settings. If a participant responded by mentioning a self-regulated learning strategy, further questions were asked to rate the strategy by frequency of utilization on a visual 4-point scale (Zimmerman & Martinez-Pons, 1988).

The results from this validation study indicated the authors’ previous conclusions that students’ SLR strategies are valid predictors of teacher ratings of those students (Zimmerman & Martinez-Pons, 1986). This also supports the findings that students high in SRL tend to be active in help-seeking for their goal attainment (Zimmerman & Martinez-Pons, 1988). Another important implication from Zimmerman and Martinez-Pons’ (1988) construct validity study found that, empirically, SRL strategies are often combined and adapted to best suit the individual’s immediate learning needs. There is not one single example that works for every learner in every situation.

**On-line Motivation Questionnaire (OMQ)**

Boekaerts (1999) developed the OMQ to study students’ motivational affect on their learning outcomes. This questionnaire includes real-world learning approaches in the categories of value- or results-driven for achievement outcomes. This instrument is provided to learners prior to an assignment, and then again when the assignment is completed or quit (Boekaerts, 1997).

In the pre-test administration, the instrument measures appraisals, intention, and affect. In the post-test, personal effort, assessment, attributions, and affect are measured. In this questionnaire, appraisals are determinations by the learner on the present or preliminary judgements, while attributions are determined after the event (Crombach, Boekaerts, & Voeten, 2003). From the design, two pathways appear as connecting motivational belief to learner results (Puustinen & Pulkkinen, 2001).
Occasionally there is difficulty in determining validity due to task specificity. One validation approach included clustering constructs of tasks measured on an ordinal scale (Cronbach et al., 2003). Both the validity and reliability of the self-report questionnaire depends upon the cognitive awareness of the learners and their appraisals, assessments, and affects. Also, the immediacy of tasks being studied demands some adaptability in learner approach. These are factors that can impact the results of this instrument (Cronbach et al., 2003).

**Motivated Strategies for Learning Questionnaire (MSLQ)**

The MSLQ is a self-report questionnaire measuring three factors of motivational beliefs (self-efficacy, intrinsic value, and test anxiety) and two factors of learning strategies (self-regulation and cognitive strategy) through a self-report questionnaire (Schunk et al., 2014). Originally the instrument was designed to gain a better understanding of college students’ motivational approaches to learning. It is a cognitive-based assessment in which the learner is “represented as an active processor of information whose beliefs and cognitions are important mediators of instructional input” (Pintrich, Smith et al., 1993, p. 801).

This instrument was developed over the span of 10 years and three waves of data collection from three different institutions simultaneously. The populations consisted of smaller colleges and universities because the funding for the project was specific in that the research must take place with college students who did not attend a high research-intensive institution (Pintrich, Smith et al., 1993). The instrument was designed to be administered in a class with a time frame of approximately 20-30 minutes. Over time, it has been used through other methods of administration and delivery (see Boyer & Usinger, 2012).

Data were gathered during three different years (1986, 1987, and 1988) from three different institutions. The data sets consisted of 326, 687, and 758 participants, respectively.
From each wave, the data were analyzed through statistical procedures to confirm reliability and determine correlations with academic success. Of all the data, the goodness-of-fit indices were .77 (GFI) and .73 (AGFI). Pintrich, Smith et al. (1993) stated, “The factor analysis and alphas of the motivational items suggest that the general model of motivational components with six scales is a reasonable representation of the data” (p. 808). The MSLQ scores aligned with expected directions in final course grades, as the $r$ ranged from .02 in extrinsic goal orientation to .41 in self-efficacy, two factors of the motivation scales (Pintrich, Smith et al., 1993).

Predictive validity was determined by correlations with the final course grade, showing that the motivational subscales reported statistically significant correlations in all areas excluding one, extrinsic goal orientation. According to Pintrich, Smith et al. (1993), “The positive motivational beliefs of intrinsic goal orientation, task value, self-efficacy, and control of learning were positively associated with the use of cognitive, metacognitive, and resource management strategies” (p. 811).

Pintrich and De Groot (1990) defined their approach to SRL as consisting of three components: metacognitive adaptation in learning, effort management and control, and strategic cognitive learning. The authors argued that there must be more to learning than these three. They developed a theoretical approach adding a fourth component, learner motivation, divided into three aspects. The first motivational aspect includes a learner’s expectations of task-related personal capability. The second aspect of motivation considers the learner’s beliefs about the value of a goal, and the third construct, affect, focuses on a learner’s emotions toward the goal and learning process (Pintrich & De Groot, 1990).

The MSLQ is divided in two scales: motivation and learning strategy. Each scale is further divided into subscales. The six subscales of motivation are intrinsic goal orientation,
extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety. The nine subscales of learning strategy are rehearsal, elaboration, organization, critical thinking, metacognitive self-regulation, time and study environment management, effort regulation, peer learning, and help seeking. According to Pintrich, Smith et al. (1993), the 15 subscales “represent a coherent conceptual and empirically validated framework for assessing student motivation and use of learning strategies in the college classroom” (p. 812).

This assessment combined concepts that had not been evaluated previously in learning transactions for a different understanding of self-regulated learning. While self-regulated learning inquiries have been developed to improve student achievement, the MSLQ was created “to provide empirical data on how motivation and self-regulated learning components may operate independently or jointly to influence student academic performance” (Pintrich & De Groot, 1990, p. 34).

**Studies of SRL**

Over time, SRL has expanded beyond the inquiry of secondary student academics to include postsecondary learning situations, workplace learning, and various other learning environments. The following studies of SRL briefly investigate research relevant to the current study.

**Issues in measurement.** Over time, the definitions that are central to understanding SRL have transformed. Bandura (1977) introduced self-efficacy in his social-cognitive theory, which strongly influenced the development of SRL theory. As researchers further investigated the concept of self-efficacy, it grew beyond what was observed in clinical test environments to a concept that can be used in general terms (Schunk & Usher, 2011). Researchers must determine
an approach to the study as a prerequisite of defining self-efficacy. Whether academic or social, self-efficacy can manifest in different ways (Schunk & Pajares, 2009). Motivation and self-efficacy are often exhibited in conjunction as learners develop goals. However, self-efficacy and SRL are context-specific concepts measured based on a learner’s personal awareness in educational environments (Bandura, 1997; Schunk & Usher, 2011). As such, motivation can be measured in myriad ways that remain relevant to SRL (Wolters et al., 2011). Clarity on the concept of motivation and how it interacts with SRL processes was imperative to this study.

**Studies in motivation.** Studies show that the implementation of motivation strategies impact academic success. An implication of such result would be to incorporate SRL and motivation strategies into learning programs (Wolters et al., 2011). These studies take place through interviews, observations, self-report scenarios, practices in thinking aloud, or trace methods. Researchers have used these methods to understand a learner’s motives for using SRL strategies, especially in less-structured learning environments (Zimmerman & Schunk, 2008). Motivation occurs in SRL by acting as a preliminary determinant, a mediator, a collaborating factor, or an end result (Zimmerman & Schunk, 2008). As such, the theoretical framework employed by the various studies are different as well.

Dweck and Master (2008) investigated the impact of self-theories on students’ perceived learning ability. Students who believed that intelligence was a fixed internal characteristic were more likely to be hopeless in the face of a challenge. However, students who believed that personal intelligence was a factor that could be adjusted and controlled were likely to seek opportunities to advance their knowledge, including the less confident learner (Dweck & Master, 2008). The results from this study supported the idea that self-perception of learning impacts SRL, and a student’s reaction to learning in the face of a challenge can indicate a belief of
success in themselves. The authors argued that learners must “have not only the learning strategies they need but also the motivation to apply them” (Dweck & Master, 2008, p. 49).

A personal interest in learning can lead to motivation through SRL (Corno, 2008). As the learner sees positive results from work and effort, personal confidence increases. Corno (2008) applied the concept of productive motivation, in which a student sees the positive results of applied work habits.

Motivation and SRL are also studied under the umbrella of self-determination theory (SDT). This approach considers goals and behaviors of students in the pursuit of education. SDT suggests a certain level of autonomy in the realm of both motivation and self-regulation (Wigfield, Hoa, & Klauda, 2008), and “is characterized by acting with a sense of volition and choice” (Reeve, Ryan, Deci, & Jang, 2008, p. 225).

Cook, Thompson, and Thomas (2011) evaluated the validity of the MSLQ in the health education field, looking at medical residents, and stated that the instrument had seldom been used in that field, but that the data analyses reported a good fit. Earley, Wisneski, and Fasko (2007) reviewed MSLQ empirical studies between 1995 and 2006, and concluded that the MSLQ seems to be useful in prediction of academic success. Soemantri, McColl, and Dodds (2018) looked at reflection on learning by administering the MSLQ to medical students and found the scale as helpful in understanding individual learning reflection. Jackson (2018) studied minority students in science, technology, engineering, and mathematics courses at a historically Black college and obtained a snapshot of SRL. Boyer and Usinger (2012, 2015) used the MSLQ to examine undergraduate students’ barriers to academic success while considering SDL and SRL in formulating a model to track pathways in student success.
The following section outlines the models that support SDL research on two categories: learner characteristics and learning processes of those individuals. The discussion of models and instruments demonstrates a foundation upon which this study was built.

**Self-Directed Learning**

SDL has long been examined in the field of adult education, providing rich foundational ideas to support its maintained relevance (Merriam & Baumgartner, 2020). In this section, I provide definitions imperative for understanding SDL, including the two classifications of SDL study. Then, a discussion of three models is provided, followed by an overview of three instruments frequently used in the study of SDL.

**Development and Definitions**

SDL is often categorized in two ways: a learning process and learner characteristics. As defined by Brockett and Hiemstra (1991), SDL “refers to both the external characteristics of an instructional process and the internal characteristics of a learner, where the individual assumes primary responsibility for a learning experience” (p. 24). These two categories are frequently seen as fluid in many cases, overlapping in ways that can be classified either way. To provide clarity, the following sections delineate these concepts.

**SDL as a process.** In Brockett and Hiemstra’s (1991) seminal work on SDL, they used the phrase, “process in which a learner assumes primary responsibility for planning, implementing, and evaluating the learning process” (p. 24), to explain the interaction within the teaching-learning transaction in SDL. Further, the authors speak to the existence and importance of a facilitator in the process, one who encourages the learner’s autonomy while providing guidance along the way. Similarly, others have suggested four dimensions that support SDL as a process: “behavior, information, motivation, and emotion” (Bulik, 2009, p. 3).
One frequently used method of SDL as a process is the learning project. Tough (1971) examined adults’ use of these projects to show the process of autonomous learning in support of SDL. Scholars continue to examine the use of learning projects by adults in nonformal and informal learning situations, as Tough found more than 40 years ago. One recent study explored the learning projects undertaken by local elected officials related to one’s career path (Smeltzer, 2016). Another study explored learning projects of small business owners (Harrison, 2010). These studies indicate the relevance of this style of learning while demonstrating the occurrence of SDL in various contexts outside of adult education. Other scholars include the successful ability to set learning objectives, create a learning plan, and develop motivational techniques as needed for individuals high in SDL capacity (du Toit-Brits & van Zyl, 2017).

SDL as learner characteristics. According to Knowles, many adults must “reorient to what learning is” (Hatcher, 1997, p. 37) to become self-directed learners. Hiemstra and Brockett (2012) and Brockett & Hiemstra (1991) identify learner characteristics related to SDL as including traits such as critical reflection, motivation, personal and educational experience, resilience, and self-efficacy. These characteristics may also include self-discipline, love of reading, and curiosity (Guglielmino, 2013; Tredoux, 2012). SDL as an individual characteristic may show as interest in an activity (Merriam & Bierema, 2013), or the assumption of responsibility (Brockett & Hiemstra, 1991), often in existence in a social context (Candy, 1991)

Models of SDL

Exploration of SDL as a learning technique is linked to the foundation of adult learning. Knowles (1975) defined the concept quickly after the introduction of andragogy. This model remained a guidepost for SDL in adult education. Brockett and Hiemstra (1991) developed the Personal Responsibility Orientation (PRO) model, later expanded to the Person Process Context
(PPC) model of SDL. A third model of SDL was developed by Grow (1991) that addressed the interaction in the teaching-learning process.

**Malcolm Knowles.** Knowles (1975) stated, “I think that self-directed learning is the best way to learn” (p. 10), and this belief was the driving force behind his work in theory, teaching, and practice. The linear approach to SDL provided by Knowles (1975) remains foundational to the SDL literature. This initial outline consisted of six steps by which adults moved sequentially through the process, determined largely by the learner’s level of independence of directional control (Brookfield, 1985). These steps are designed to move a learner toward becoming more self-directed, regardless of the order in which the steps occur, while experiencing a successful learning experience with the aid of a well-designed learning project (Peters, Taylor, & Doi, 2009).

**Staged self-directed learning model.** Grow (1991) determined the dynamic nature of SDL was as integral to the learning experience as other parts of the learning process. One contingent factor was learner interest or motivation in various learning environments. As such, the Staged Self-Directed Learning (SSDL) model reflects a staged learning process, growing from dependent learners (stage 1) to a more autonomous learning role (stage 4). In this model, SDL is considered situational and the involvement of the teacher changes as the learner progresses through the four stages (Knowles, Holton, & Swanson, 1998). The moderate transitional change of a learner accounts for positive and negative experiences during the teaching and learning transaction, in addition to what the learner brings into the experience (Long, 1994).

**PRO/PPC models.** The Personal Responsibility Orientation (PRO) model illustrates the transactional learning process of an individual with learner characteristics in a social context
(Brockett & Hiemstra, 1991). The factors of the learning process and learner characteristics are situated within a social context of learning. These constructs, acknowledged as separate in this model, are connected through the SDL experience. The learner assumes responsibility for the learning process, and this conscious decision is a learner characteristic imperative to self-direction in learning (Brockett & Hiemstra, 1991).

The learner takes responsibility for planning, facilitation, and execution of learning, but does not necessarily assert control over the environment in which the learning takes place. This is an external factor in a learning transaction and is considered a social concept. The learner characteristics that drive the pursuit of learning endeavors can include creativity, motivation, and resilience (Hiemstra & Brockett, 2012).

The teaching-learning transaction, or the learning process, considers the facilitation, teaching and learning styles, and skills (Hiemstra & Brockett, 2012). In this component, experiences beyond the learner characteristic are acknowledged. This is an illustration of the interaction between the teacher and the learner, and the production that results from each unique learning process. This is a dynamic and fluid transaction that largely affects the experience of SDL.

This model was further adapted into the Person Process Context (PPC) model to include “new understandings of SDL,” while “retaining the essence” (Hiemstra & Brockett, 2012, p. 155) of the original model. The updated model highlighted the social context as an equal component, one of three key factors in the SDL process, instead of an all-encompassing environment within which the learner characteristics and learning transaction takes place (Hiemstra & Brockett, 2012). The PPC model is the approach on which this study was based.
Measuring SDL

As investigation into SDL grew, the number of measurement tools increased as well. Multiple instruments have been developed to investigate the impact of SDL in various learning environments. This led to a broader understanding of SDL process and characteristics. Guglielmino’s (1977) Self-Directed Learning Readiness Scale (SDLRS) set the stage for survey research in the field. The Oddi Continuing Learning Inventory (OLCI) (Oddi, 1986) was developed to study learner characteristics in SDL. Stockdale’s (2003) PRO-SDLS, based on Brockett and Hiemstra’s (1991) PRO model, is the third scale introduced in this section, and the one I used in this study.

These instruments have been used to understand SDL in various settings with some secondary investigation into relationships with gender. Thus far, there has been no consistent pattern in the research to represent a relationship between gender and SDL. However, some studies have found relationships between different age and gender combinations. In one case, females age 14–20 scored significantly higher than males of the same age in readiness for SDL (Reio & Davis, 2005). In another study, the mean overall score of readiness in SDL for females was higher than males, but the difference was not statistically significant (Van Duyne, 2017). Stockdale (2003) and Ruttencutter (2018) reported no significant difference of SDL by gender, while Holt (2011) reported a significant difference by gender in initiative, a factor of the PRO-SDLS.

**Self-Directed Learning Readiness Scale.** The widely used Self-Directed Learning Readiness Scale (SDLRS) (Guglielmino, 1977) places emphasis on the learner’s propensity for SDL in learning processes. This scale has been adapted for use in academic and professional settings, such as by nursing professionals and college students (Fisher, King, & Tague, 2001;
Litzinger & Wise, 2005; Long & Agyekum, 1983; Williams & Brown, 2013). This instrument allows SDL to be viewed on a continuum, as the results provide information on varying degrees of attributes and skills among individuals (Brockett & Hiemstra, 1985).

**Oddi Continuing Learning Inventory.** The Oddi Continuing Learning Inventory (OCLI) (Oddi, 1986) provided a different approach to measuring SDL. With this tool, researchers study SDL as it is exhibited through personality traits. Three characteristics found in self-directed learners are proactive learning, belief in intelligence as a fluid trait, and having an active interest in learning (Harvey, Rothman, & Frecker, 2006). The OCLI scale was originally used on graduate students studying law, nursing, and adult education to establish reliability and validity. It has since been used to measure SDL in various groups of individuals (Hemby, 1998).

**Personal Responsibility Orientation to Self-Directed Learning Scale.** Scholars have worked to study SDL as a dynamic form of learning. Stockdale’s (2003) Personal Responsibility Orientation to Self-Directed Learning Scale (PRO-SDLS) evaluates Brockett and Hiemstra’s (1991) PRO model in action among college students. This scale is divided into two sections: the teaching-learning aspect, consisting of factors of control and initiative, and the learner characteristics aspect, which focuses on the factors of self-efficacy and motivation (Stockdale & Brockett, 2011). This specific emphasis was the bridge between SRL and SDL for this study.

Three pilot studies were conducted in the development of the PRO-SDLS. Two studies were compared to the SDLRS, and the third was aligned with the PRO model to evaluate findings on the components of teaching-learning transaction and learner characteristics (Stockdale, 2003). With a high coefficient alpha (.92) from the third pilot study, Stockdale (2003) determined sufficient reliability. To address initial content validity, a panel of experts was
asked to consider whether the items included represented SDL as presented by the PRO model (Stockdale, 2003).

The PRO-SDLS has been used to investigate students in various learning situations. Multiple studies have used this tool to gain a better understanding of SDL in college students, further validating the scale in various samples. Fogerson (2005) investigated online course participant satisfaction as related to various learner readiness factors. Beard (2016) and Holt (2011) measured self-direction and technology use by preservice teachers and workforce entrants, respectively. The PRO-SDLS has also been used in conjunction with positive psychology aspects, such as resilience, grit, wellness, and gratitude (Beeler, 2018; Ruttencutter, 2018; Teal, Vess, & Ambrose, 2015; Vess, 2015). Findings from these studies link SDL with age and GPA across students of various disciplines (Stockdale & Brockett, 2011).

**Connections: SDL and SRL**

According to Bandura (1986), “[f]ull understanding of self-regulatory mechanisms requires examination of naturally occurring self-directed change” (p. 354). Literature shows many similarities between SDL and SRL in theory and in learning processes. Some scholars argue that the difference lies in the strength of influence; as self-regulated learners exhibit strength in “cognitive and motivational features of learning, while the strength of SDL is its external control features” (Pilling-Cormick & Garrison, 2013, p. 29). Other scholars suppose that the link between the two is less clearly defined, citing frequent usage of the terms interchangeably (Saks & Leijen, 2014). This ambiguity leads to confusion among scholars and practitioners, which in turn leads to improper instruction and transmission to students (Brockett & Hiemstra, 1991). Brookfield (1985) implores that scholars hold a responsibility to critically assess the concept of SDL, otherwise “a potentially useful concept, which possesses some
explanatory power and which can become the focus of a purposeful research effort, is in danger of being debased by frequent and arbitrary use” (p. 6).

Bandura’s (1986) condition of self-regulatory capability suggested that the two terms were separate constructs but complementary, existing in a way that one requires the other. He stated that “[s]elf-directedness is exercised by wielding influence over the external environment as well as enlisting self-regulatory functions” (Bandura, 1986, p. 21). Pintrich (2000) explained that SRL activities exist within the relationship among individuals, their learning context, and educational accomplishments. Looking to Brockett and Hiemstra’s (1991) PRO model, the similarities among these components of the two types of learning are clearly parallel in some ways.

More recently, researchers began looking at the relationship between SDL and character strengths of positive psychology. Beeler (2018) looked at resilience and SDL in nursing students, and Robinson (2003) also looked at resilience and SDL in graduate students. Dieffenderfer (2014) evaluated instances of hope and SDL in the workplace. Vess (2012) explored gratitude and SDL in undergraduate nursing students. Anderson and Brockett (2008) suggested that the development of learner strengths can enhance the approach to adult learning by fostering self-direction in learning. This included focusing on learner characteristics such as self-efficacy, motivation, resilience, and grit (Ruttencutter, 2018).

**Summary**

Bandura (1986) stated, “An act, therefore, includes among its determinants self-produced influences” (p. 20). This review of literature is an examination of theory surrounding such influences. SDL has been called a “way of life” (Brockett & Hiemstra, 1991, p. 2). SRL indicates a presence of “personal initiative, perseverance, and adoptive skill” (Zimmerman, 2010, p. 70).
This chapter provided a detailed look at SRL, beginning with a discussion of positive psychology followed by foundations in socio-cognitive theory, and then an overview of various SRL models and instruments used frequently in research. This section included research on the MSLQ. Additionally, I discussed SDL models and instruments, with special emphasis on the PRO-SDLS. I concluded with an illustration of the connections between SDL and SRL. Chapter Three presents the method of the study. Further explanation of the research questions, population, and sample are provided as well.
Chapter Three

Method

Master’s students as individuals are unique in their learning but have similar personal characteristics and learning processes. The constructs of self-direction and self-regulation are both considered characteristics and processes of an adult learner. In this study I examined the relationship between these two variables in the process of learning by students pursuing a master’s degree. To illustrate relationships within these two learning constructs, this chapter outlines the intent and plan of the research method.

Four questions provided the structure for a strategic plan to examine the relationship between SDL and SRL in students pursuing a master’s degree. As provided originally in Chapter One, the research questions that guided this study were:

1. Is there a significant relationship between self-directed learning and self-regulated learning in current master’s students?
2. Are there significant relationships between the four factors of self-directed learning and 15 factors of self-regulated learning?
3. Is there a significant relationship between self-directed learning, age, and gender?
4. Is there a significant relationship between self-regulated learning, age, and gender?

The following sections provide information on the population and sample, instrumentation, procedure, and data analysis. These are the guideposts for my method, all of which were created with the research questions in mind.

Research Design

Based on my research questions, I designed an exploratory survey study into the phenomenon of SDL and SRL of master’s students. Overall, this study searched for correlations
and relationships among SDL, SRL, age, and gender. First, I planned to examine the basic relationship between the two main variables of SDL and SRL. Second, I wanted to determine if there were significant relationships or differences between SDL relating to age and gender. Third, I wanted to determine if there were significant relationships or differences between SRL based on age and gender. The statistical approach I used to discern any significance in the data included descriptive and correlational statistics.

**Population and Sample**

The population for this study included master’s students of an R1 public institution in the southeastern United States. The University of Tennessee, Knoxville, was chosen for three main reasons. First, the selection of one institution minimizes the effect of various social context experiences on study results. Second, I am familiar with the population of this university as well as the environment in which the institution is situated. Third, my data collection process was largely hindered by the COVID-19 pandemic, making the option of research outside the university excessively challenging. Therefore, the students involved in this study were at least unified by educational institution, though the inclusion of different colleges provides some diversity. These students in my sample were progressing toward a master’s degree in the College of Social Work, the College of Business, or the College of Education, Health, and Human Sciences.

The College of Business houses four master's degree programs. The following demographic information of current programs was provided by the director of graduate studies. The Master of Science in Management and Human Resources has 16 students. This program's demographic is made up of 40% male and 60% female. The Master of Accountancy has 107 students enrolled, with 54% male and 56% female. The Master of Science in Business Analytics
has 39 students enrolled, 70% male and 30% female. The Master of Business Administration (MBA) has 46 students, with the demographic of 73% male and 27% female.

A smaller set of the business students were enrolled in a professional, accelerated degree program. This program is a lockstep, structured, 16-month set curriculum that begins annually in August. These students do not have a concentration for their MBA degree. According to the demographic report provided by the program director, there were 54 members of this program. This demographic was composed of 64% male students and 37% female students.

The College of Education, Health, and Human Sciences offers a master’s degree in the following departments: Child and Family Studies; Educational Leadership and Policy Studies; Educational Psychology and Counseling; Kinesiology, Recreation, and Sport Studies; Nutrition; Public Health; and Theory and Practice in Teacher Education. As of fall 2019, the total enrollment of these programs for master’s degrees was 503. According to the office that provides reports on institutional data, in public health the student demographic is 69.7% female, 30.3% male. Of the other majors in the college, the female majority was 76.6% to 23.4% male.

The College of Social Work offers one master’s program: Master of Science in Social Work. According to the director of the program, there were 285 students enrolled as of summer 2020. This cohort consisted of 14% male and 86% female students.

To provide a broader perspective, the total university enrollment reported in the institutional research data in October 2018 for graduate level students was 6,079, including PhD students. Master’s degrees conferred between July 2017 and June 2018 totaled 1,554.

The sample for this study was contacted through an email survey containing two instruments, which are discussed in detail in the following sections. I determined that a minimum
sample size of 100 would be appropriate. That size would allow a decent convenience sample in which I could analyze relationships of SDL and SRL.

**Instrumentation**

I used two scales to measure the variables of this research study. The Personal Responsibility Orientation to Self-Directed Learning Scale (PRO-SDLS) (Stockdale, 2003) provided a structured scale for SDL data. The Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith et al., 1993) was used for collection of SRL data. In addition, I administered a demographic questionnaire that provided the information needed for age and gender of the student participant.

**PRO-SDLS: Personal Responsibility Orientation to Self-Directed Learning Scale**

Stockdale (2003) created the PRO-SDLS as a method to measure the components of Brockett and Hiemstra’s (1991) Personal Responsibility Orientation (PRO) model. This model was later adapted for the purposes of clarity but was not changed significantly. Therefore, the more recent Person Process Context (PPC) (Hiemstra & Brockett, 2012) model is the guiding framework for the SDL theory in this research. This model provides three constructs upon which SDL transactions depend: personal characteristics, learning processes, and the learning context (Hiemstra & Brockett, 2012). The PRO-SDLS focuses on the first two of these constructs.

The PRO-SDLS consists of 25 questions on the 5-point Likert-scale type, determined reliable with an α of .91 for the scale overall. These questions are divided into four subscales, or factors: initiative (α = .81), control (α = .78), motivation (α = .82), and self-efficacy (α = .78) (Stockdale & Brockett, 2011, p. 170).

Other studies have found the reliability of the total instrument to be high. Fogerson (2005) was one of the first to use the scale and found reliability at .91, similar to Stockdale’s
(2003) original findings of .92. Beeler (2018) recently found the reliability of the total scale to be .89, while the factors measured high as well: initiative was .77, control was .78, self-efficacy was .83, and motivation was .75. Ruttencutter (2018) also found the reliability to be reasonably high at .80.

The PRO-SDLS was a reliable option for use in this study. It has been repeatedly validated as a tool for measuring SDL factors of college students. Experts validated this scale upon creation, and in doing so, the four factors were determined to be supportive of SDL processes and characteristics by focusing on college students (Stockdale & Brockett, 2011). The PRO-SDLS emerged as a tool that did not measure SDL factors in the same way as Guglielmino’s (1977) SDLRS and added valuable insight to the learning process (Fogerson, 2005).

This scale is situated in higher education, allowing measurement of the learning process and personal characteristics while the context remains constant (Stockdale & Brockett, 2011). This allows the contextual variable to be controlled for statistical purposes. Situated within the subscale for data on the teaching and learning transaction are initiative and control. For the area of learner characteristics, measurement of two subscales provide data on self-efficacy and motivation. The bridge to SRL in the measurement process is here, as the SRL scale focuses on motivation, including self-efficacy.

**MSLQ: Motivated Strategies for Learning Questionnaire**

Pintrich, Smith et al. (1993) designed a self-reported questionnaire with two sections to measure the use of learning strategies and motivation of college students. This instrument uses a Likert scale of 81 items with a 7-point scale of response options that range from 1 = *not at all true for me* to 7 – *very true for me*. In addition, there are 15 subscales, predetermined factors, that
can be measured as a unit or individually (Pintrich, Smith et al., 1993). The models used in development of this scale include a general cognitive approach to learning, as well as Pintrich’s (1988) social-cognitive approach to motivation.

For measurement options in SRL, there are generally two approaches found in literature. One approach studies SRL as an event or a specific occurrence in action. The second approach considers an individual’s aptitude for self-regulation in learning situations (Saks & Leijen, 2014). The latter is best suited for comparison to SDL, and where the MSLQ results are aligned.

To establish validity, Pintrich, Smith et al. (1993) utilized criterion validity through the correlations of both learning strategies and motivation with final grades in the courses. The overall determination was that the scale had “relatively good reliability in terms of internal consistency” (Pintrich, Smith et al., 1993, p. 811). Both the scales and all factor subscales were also correlated with each other in the direction the authors expected, validating that the MSLQ measures what it was created to measure (Pintrich, Smith et al., 1993). This also led to an initial belief that predictive reliability of the subscales was promising, despite the result of modest significant relations. According to the authors, the use of college course grades is not a reliable method of motivation or learning processes.

Norms were not developed in creation of the MSLQ due to the course-level design, and the authors assumed the results would vary based on different courses (Duncan & McKeachie, 2005). Table 3.1 provides the alpha for each subscale of the instrument. Cook et al. (2011) found the reliability of .93 for the total instrument in a study of medical residents. Wolters (2003) reported Cronbach’s alpha for the factor subscales as ranging from .75 to .90 when researching academic procrastination in college students. Zimmerman and Kitsantas (2014) reported reliability at .75 in a study of self-regulation and self-discipline among high school students. The
Table 3.1
*MSLQ Subscale Alpha*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pintrich, Smith et al. (1993) α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic goal orientation</td>
<td>.74</td>
</tr>
<tr>
<td>Extrinsic goal orientation</td>
<td>.62</td>
</tr>
<tr>
<td>Task value</td>
<td>.90</td>
</tr>
<tr>
<td>Control of learning belief</td>
<td>.68</td>
</tr>
<tr>
<td>Self-efficacy of learning and performance</td>
<td>.93</td>
</tr>
<tr>
<td>Test anxiety</td>
<td>.80</td>
</tr>
<tr>
<td>Rehearsal</td>
<td>.69</td>
</tr>
<tr>
<td>Elaboration</td>
<td>.76</td>
</tr>
<tr>
<td>Organization</td>
<td>.64</td>
</tr>
<tr>
<td>Critical thinking</td>
<td>.80</td>
</tr>
<tr>
<td>Metacognitive self-regulation</td>
<td>.79</td>
</tr>
<tr>
<td>Time and study environment</td>
<td>.76</td>
</tr>
<tr>
<td>Effort regulation</td>
<td>.69</td>
</tr>
<tr>
<td>Peer learning</td>
<td>.76</td>
</tr>
<tr>
<td>Help seeking</td>
<td>.52</td>
</tr>
</tbody>
</table>
original goodness of fit indices for the MSLQ were: GFI = .78, AGFI = .75, x2/df = 2.26; RMR = .08 (Pintrich, Smith et al., 1993).

As the most frequently used measurement tool of self-regulated learning, I was able to review at least 75 studies out of the hundreds of studies in which the MSLQ has been used (Duncan & McKeachie, 2005; Panadero, 2017). This literature is reviewed in Chapter Two. The scale has been used in a wide variety of contexts, including graduate-level education settings, workplace learning, and secondary education. One reported observation suggested that the factor scales might be simplified for better analysis (Cook et al., 2011). Another study found that while it may appear beneficial to remove subscales to shorten the instrument, the issue then becomes how to produce an adapted model that works as well as the entire MSLQ (Hilpert, Stempien, Van Der Hoeven Kraft, & Husman, 2013).

Demographic Information Scale

The demographic information scale allowed me to see relationships between age and gender, used in conjunction with results obtained from the PRO-SDLS and the MSLQ. Previous studies have shown that age has a modest to significant positive relationship with SDL (Conner, 2012; Fogerson, 2005; Guglielmino, 1977; Reio & Davis, 2005; Stockdale & Brockett, 2011). This is less consistent in relationships of gender and SDL or SRL, but in some situations a difference still exists (Gabrielle, Guglielmino, & Guglielmino, 2006; Holt, 2011; Rager, 2006; Reio & Davis, 2005; Zimmerman & Martinez-Pons, 1986). As such, I included these data in my collection procedure.

Procedure

After obtaining approval from the Institutional Review Board, my data collection began on April 15, 2020. Initially, I coordinated with contacts for each of the eight programs in the
College of Education, Health, and Human Sciences at the University of Tennessee. I used QuestionPro to administer the survey electronically. First, because all department heads gave permission, I asked the approved individuals to disburse my survey to the graduate students in their respective programs; therefore, I had no access to identifiable information of the participants (Appendix A, Appendix B). They then sent the email to students in their department. The email contained a link to the survey, which began with the required consent form to participate (see Appendix C). Upon agreement to participate by clicking “Continue,” participants were directed to the PRO-SDLS, followed by the MSLQ. The estimated completion time was around 15 minutes. I left the survey open for participation for 14 days and sent reminder emails to the departmental contacts at five days and 10 days (April 20 and April 26). Some of the individuals sent out the survey to students after the reminder emails. Some individuals sent reminder emails to the students. Due to low participation rates (N = 42), it was necessary to reassess the procedure, so I submitted an amendment to IRB to expand my data collection.

After contacting the deans of multiple colleges across the university, I received responses from directors of programs in the Colleges of Social Work and Business. The request was approved (Appendix D). In mid-May 2020 program directors distributed the survey by email to current master’s students in the Colleges of Social Work and Business (Appendix E). This expanded the sample size from 557 to 1,050. Additionally, two professors in the College of Education, Health, and Human Sciences agreed to make an announcement in class and share the survey link in two summer courses. A reminder email was sent to current master’s students by the departmental contacts in the Colleges of Social Work and Business the first week of June 2020. The survey was closed the following week, after two months of remaining open to
participants. The total number of surveys initiated was 162. After excluding incomplete surveys, the final sample size was 105.

**Data Analysis**

The collected data were imported from QuestionPro to SPSS to complete the analysis. First, I ran descriptive statistics to obtain a profile of the participants in the study and to know how much data would be included in my sample. I checked the normality assumption to confirm distributions before moving forward.

Next, I addressed the concern of reliability. To do this, I conducted the test of Cronbach’s coefficient alpha (α), which provided information on each scale’s internal consistency reliability. Once reliability was determined within my study, I conducted my analysis of the four research questions. The approach I took largely depended on whether the data were normally distributed. I moved forward with the following procedures for each question, as outlined below.

*Research question 1: Is there a significant relationship between self-directed learning and self-regulated learning in current master’s students?*

To address this question, I ran correlational tests on the descriptive data, as well as between the PRO-SDLS and the MSLQ scales and existing factor subscales. Because the distribution was normal, I used the Pearson correlation.

*Research question 2: Are there significant relationships between the four factors of self-directed learning and the 15 factors of self-regulated learning?*

First, I ran Cronbach’s alpha to determine reliability of factor subscales for my sample. Then, I used Pearson correlation to analyze each of the existing four factors from the PRO-SDLS with each of the 15 factor subscales of the MSLQ.
Research question 3: Is there a significant relationship between self-directed learning, age, and gender?

To determine the answer, I used various tests. First, I used the Pearson correlation test to analyze the relationship between the PRO-SDLS score and age. I ran the test for both the composite and existing factor subscales with age. Next, I used an ANOVA to examine the relationship between the composite score from the PRO-SDLS and gender. Then, I used correlation for analyzing the existing factor subscale scores and gender.

Research question 4: Is there a significant relationship between self-regulated learning, age, and gender?

Much like the analysis for the third research question, I used various tests. First, I used the Pearson correlation test to analyze the relationship between the MSLQ scores and age. I ran the test for both the composite and factor subscales with age. Next, I used an ANOVA to examine the relationship between the composite score from the MSLQ and gender. Then, I used correlation for analyzing the factor subscale scores and gender.

Summary

The purpose of this study was to examine the relationship between SDL and SRL among adult learners in master’s education. The study sample included master’s students in education, health, and human sciences programs, social work programs, and business programs. Following IRB approval, the data from administering the self-report surveys of demographic information, PRO-SDLS, and MSLQ were electronically gathered and analyzed via the QuestionPro program and SPSS.
Chapter Four

Analysis of Data

The purpose of this study was to examine the relationship between SDL and SRL among adult learners in master’s education. Data collected from 105 participants were used to answer the four research questions presented in Chapters One and Three. Chapter Four contains the analysis of the data, beginning with an overview of the sample. Then I provide the results of the analyses. Finally, I discuss the results of the research questions.

Overview of the Sample

Three colleges were contacted for participation in this study: Education, Health, and Human Sciences; Social Work; and Business. The number of master’s students enrolled in the colleges was 1,050. Students in the professional MBA program and College of Education, Health, and Human Sciences were contacted in April through email. The College of Social Work and the College of Business sent emails in early June to students enrolled during the summer session. Two professors in the College of Education, Health, and Human Sciences also provided the link to students in each summer course. The total number of students who started the survey, giving consent to use the data, was 162. Of those, 51 dropped out, bringing the total surveys to 111. Of the 111 surveys, six surveys were incomplete and therefore removed. This left the usable survey total as 105.

Demographics

The survey allowed participants to specify a numeric age. Every participant answered \((n = 105)\), and the ages ranged from 22 to 72. The mean age was 32.5 with a standard deviation \((SD)\) of 10.5. The median age was 28, and the mode was 23 \((n = 15, 14.3\%)\). Participants were asked to report their gender, with the choices of male, female, or Please Specify. More than 75%
of the participants were female \((n = 79)\), and almost 25\% were male \((n = 26)\). Table 4.1 provides the table representation of descriptive statistics for this study.

**Instrumentation**

I used two instruments to create the survey: the PRO-SDLS (Stockdale, 2003) and the MSLQ (Pintrich et al., 1991). Demographic questions were included to gather data on age and gender through descriptive statistics. Then, Cronbach’s alpha was used to conduct reliability analyses for each scale to determine internal consistency in relation to previous studies. Finally, correlational analyses were conducted for each scale as well as age and gender.

**PRO-SDLS**

The first survey students completed was the PRO-SDLS. This scale consists of 25 items. Each item is scored on a 5-point Likert scale. Scores range from a low of 25 to a high of 125. The higher scores are interpreted as representing an individual with a high level of self-direction in learning, while a lower score represents a lower level of self-direction in learning. For this sample, the mean score was \( M = 93.39 \) \((SD = 12.61)\), with a maximum score of 116 and a minimum of 53. Table 4.2 below provides the descriptive data for the PRO-SDLS composite and subscales for the Stockdale and Brockett (2011) study and the current study. Comparable studies have reported mean scores ranging from Stockdale and Brockett’s (2011) reported 80.05 to Ruttencutter’s (2018) 97.86. Table 4.3 provides the means from other studies for comparison.

**Reliability.** Cronbach’s reliability coefficient alpha ranges in value from zero to 1. For this study, the alpha for PRO-SDLS was .87. This number is close to the Stockdale and Brockett (2011) study, in which the alpha was .91 for the total scale. For this study, the factor subscale reliability coefficients were \textit{initiative} \( \alpha = .65 \), \textit{control} \( \alpha = .76 \), \textit{self-efficacy} \( \alpha = .81 \), and \textit{motivation} \( \alpha = .84 \). Again, these are close to the findings of Stockdale and Brockett (2011), with
Table 4.1
Descriptive Statistics of Participants: Age and Gender

<table>
<thead>
<tr>
<th></th>
<th>n (%)</th>
<th>Range</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>105</td>
<td>50</td>
<td>22</td>
<td>72</td>
<td>32.5</td>
<td>10.53</td>
</tr>
<tr>
<td>Male</td>
<td>26 (24.8%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>79 (75.2%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specified</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2
Score Comparisons for PRO-SDLS

<table>
<thead>
<tr>
<th></th>
<th>Stockdale &amp; Brockett (2011)</th>
<th>Current Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>SDL Composite</td>
<td>80.05</td>
<td>12.47</td>
</tr>
<tr>
<td>Initiative</td>
<td>17.79</td>
<td>3.89</td>
</tr>
<tr>
<td>Control</td>
<td>20.24</td>
<td>3.66</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>22.09</td>
<td>3.48</td>
</tr>
<tr>
<td>Motivation</td>
<td>20.17</td>
<td>4.16</td>
</tr>
</tbody>
</table>

Table 4.3
PRO-SDLS Composite Score Comparisons

<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Population*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current study</td>
<td></td>
<td>105</td>
<td>93.39</td>
<td>12.61</td>
<td>M</td>
</tr>
<tr>
<td>Ruttencutter</td>
<td>2018</td>
<td>118</td>
<td>97.86</td>
<td>12.31</td>
<td>D</td>
</tr>
<tr>
<td>Beard</td>
<td>2016</td>
<td>102</td>
<td>91.50</td>
<td>12.92</td>
<td>U</td>
</tr>
<tr>
<td>Conner</td>
<td>2012</td>
<td>137</td>
<td>92.87</td>
<td>13.45</td>
<td>U/M/D</td>
</tr>
<tr>
<td>Holt</td>
<td>2011</td>
<td>519</td>
<td>89.13</td>
<td>11.54</td>
<td>U</td>
</tr>
<tr>
<td>Hall (post)</td>
<td>2011</td>
<td>110</td>
<td>89.62</td>
<td>10.03</td>
<td>U</td>
</tr>
<tr>
<td>Hall (pre)</td>
<td>2011</td>
<td>110</td>
<td>91.17</td>
<td>10.92</td>
<td>U</td>
</tr>
<tr>
<td>Fogerson</td>
<td>2005</td>
<td>217</td>
<td>96.91</td>
<td>11.82</td>
<td>U/M/D/O</td>
</tr>
<tr>
<td>Stockdale</td>
<td>2003</td>
<td>194</td>
<td>84.05</td>
<td>12.47</td>
<td>U/M/D</td>
</tr>
</tbody>
</table>

a post-test; b pre-test; *U undergraduate; M master’s; D doctorate; O other (non-credit, certificate, etc.)
the exception of initiative. With question 25 removed, the initiative \( \alpha = .72 \), much closer to the reliability coefficient of other similar studies (see Beard, 2016; Hall, 2011a; and Holt, 2011).

**MSLQ**

The MSLQ contains 81 total items on a 7-point Likert scale. The scale has two sections: motivation and learning strategies. These sections are further broken down into 15 different factor subscales. The motivation section consists of 31 items, and the learning strategies section consists of 50 items. Scores are based on the mean of items in each scale. The composite MSLQ mean score for this study was \( M = 4.99 \) (\( SD = .59 \)), with a maximum score of 6.20 and a minimum score of 3.53.

**Reliability.** For this study, the internal consistency was high for the total scale, with \( \alpha = .92 \). The subscale reliability ranged from \( \alpha = .45 \) (help seeking) to \( \alpha = .93 \) (self-efficacy of learning and performance). The manual for the MSLQ (Pintrich et al., 1991) provided initial reliability coefficient alphas for each factor subscale. See Table 4.4 below for the subscale alpha comparison of the manual and the current study.

**Analysis of Research Questions**

Four research questions guided this study. These research questions were presented in Chapters One and Three. I present the analysis of those questions in this section. The first research question was created with the intention of exploring the relationship between SDL and SRL. The PRO-SDLS measured SDL and SRL using the MSLQ. The strength of the relationship was examined at the composite level from each scale. The second research question was created to examine relationships between the existing factors of SDL and SRL. The third question was created to examine the relationships between SDL, age, and gender. The fourth question was created to examine relationships between SRL, age, and gender. I exported data from
Table 4.4
*Cronbach’s Alpha for MSLQ (Pintrich et al., 1991) and Current Study*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pintrich, et al. α</th>
<th>Current Study α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic goal orientation</td>
<td>.74</td>
<td>.74</td>
</tr>
<tr>
<td>Extrinsic goal orientation</td>
<td>.62</td>
<td>.66</td>
</tr>
<tr>
<td>Task value</td>
<td>.90</td>
<td>.91</td>
</tr>
<tr>
<td>Control of learning belief</td>
<td>.68</td>
<td>.60</td>
</tr>
<tr>
<td>Self-efficacy of learning and performance</td>
<td>.93</td>
<td>.93</td>
</tr>
<tr>
<td>Test anxiety</td>
<td>.80</td>
<td>.83</td>
</tr>
<tr>
<td>Rehearsal</td>
<td>.69</td>
<td>.73</td>
</tr>
<tr>
<td>Elaboration</td>
<td>.76</td>
<td>.77</td>
</tr>
<tr>
<td>Organization</td>
<td>.64</td>
<td>.72</td>
</tr>
<tr>
<td>Critical thinking</td>
<td>.80</td>
<td>.83</td>
</tr>
<tr>
<td>Metacognitive self-regulation</td>
<td>.79</td>
<td>.76</td>
</tr>
<tr>
<td>Time and study environment</td>
<td>.76</td>
<td>.81</td>
</tr>
<tr>
<td>Effort regulation</td>
<td>.69</td>
<td>.77</td>
</tr>
<tr>
<td>Peer learning</td>
<td>.76</td>
<td>.78</td>
</tr>
<tr>
<td>Help seeking</td>
<td>.52</td>
<td>.45</td>
</tr>
</tbody>
</table>
QuestionPro into SPSS to conduct the data analyses for the four questions. The results are reported below.

**Research Question 1**: Is there a significant relationship between self-directed learning and self-regulated learning in current master’s students?

The first test employed was to determine reliability of the two scales. Next, descriptive statistics confirmed the assumption of normalcy in distribution. After these initial tests, correlation analysis was conducted on the two composite scores to answer the first research question. Pearson’s product moment correlation coefficient (Pearson’s \( r \)) was used to find a relationship between the PRO-SDLS and MSLQ. Interpreting this number depends on understanding effect size at the .05 significance level. A large effect is considered .50, .30 is a medium effect, and .10 is a small effect (Aron, Aron, & Coups, 2005). To avoid issues of collinearity, or essentially measuring the same construct, the correlation coefficient should be less than .90 (Aron et al., 2005; Jackson, 2010).

Table 4.5 notes Pearson’s correlation coefficient was .55 (\( p > .001 \)) for SDL and SRL. Therefore, the composite scores indicated a significant positive relationship with a large effect size. To produce a coefficient of determination to account for variance, Pearson’s \( r \) is squared. For this study, \( r = .55 \), making \( r^2 = .31 \). Therefore, 31% of variance in participant levels of SDL is accounted for by levels of SRL. This significant relationship means that participants with high SDL scores likely have high SRL scores. Figure 4.1 provides visual context for the relationship.
Table 4.5
*Pearson’s Product-moment Correlation Coefficient (r) between PRO-SDLS and MSLQ*

<table>
<thead>
<tr>
<th></th>
<th>PRO-SDLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSLQ</td>
<td>Pearson’s r</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

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

*Figure 4.1* Scatterplot of relationship between PRO-SDLS and MSLQ composite scores
**Research Question 2:** Are there significant relationships between the four factors of self-directed learning and 15 factors of self-regulated learning?

After determining the correlation between the two composite scores, I narrowed the focus to the scores of each factor subscale. For this research question, a correlation was conducted to test the relationship between the existing factor subscales of the PRO-SDLS and the MSLQ.

Significant positive relationships were found among multiple subscales of the PRO-SDLS and the MSLQ. *Initiative* had a significant positive relationship with the following factor subscales of the MSLQ: intrinsic goal orientation, task value, self-efficacy of learning and performance, elaboration, organization, critical thinking, metacognitive self-regulation, and time and study environment. *Control* had a significant positive relationship with the following factor subscales of the MSLQ: self-efficacy of learning and performance, rehearsal, elaboration, organization, metacognitive self-regulation, time and study environment, and effort regulation. *Self-efficacy* had a positive correlation with the MSLQ factor subscale of time and study environment. *Motivation* had a significant positive correlation with the following factor subscales of the MSLQ: intrinsic goal orientation, task value, control of learning belief, self-efficacy of learning and performance, and test anxiety. See Appendix E for correlation data among the factor subscale data of the two instruments.

Significant positive relationships were found among multiple subscales of the PRO-SDLS and the MSLQ. *Initiative* had a significant positive relationship with the following factor subscales of the MSLQ: intrinsic goal orientation, task value, self-efficacy of learning and performance, elaboration, organization, critical thinking, metacognitive self-regulation, and time and study environment. *Control* had a significant positive relationship with the following factor subscales of the MSLQ: self-efficacy of learning and performance, rehearsal, elaboration,
organization, metacognitive self-regulation, time and study environment, and effort regulation. *Self-efficacy* had a positive correlation with the MSLQ factor subscale of time and study environment. *Motivation* had a significant positive correlation with the following factor subscales of the MSLQ: intrinsic goal orientation, task value, control of learning belief, self-efficacy of learning and performance, and test anxiety. See Appendix E for correlation data among the factor subscales of the two instruments.

To gain a better understanding of how these two surveys interact, I ran additional tests. I ran a correlation between the composite PRO-SDLS score and the existing subscales of the MSLQ. Table 4.6 shows the significant relationship of the composite PRO-SDLS with 10 of the existing 15 MSLQ subscales. The factors not included in this table are the subscales without significant relationships: external goal orientation, test anxiety, rehearsal, peer learning, and help seeking.

Additionally, I ran a correlation between the composite MSLQ scores and the subscales of the PRO-SDLS. Table 4.7 shows the significant relationship of the composite MSLQ with three of the four subscales of PRO-SDLS: initiative, control, and motivation.

**Research Question 3:** Is there a significant relationship between self-directed learning, age, and gender?

Various tests were conducted to examine relationships among SDL and the demographics of age and gender. I present the findings on relationships with age and PRO-SDLS scores at the composite level as well as the factor subscale level.
Table 4.6
*Pearson’s Product-moment Correlation Coefficient (r) between PRO-SDLS and factors of MSLQ*

<table>
<thead>
<tr>
<th>PRO-SDLS Pearson Correlation</th>
<th>IGO</th>
<th>TV</th>
<th>CLB</th>
<th>SELP</th>
<th>ELA</th>
<th>ORG</th>
<th>CT</th>
<th>MSR</th>
<th>TSE</th>
<th>ER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.010</td>
<td>.000</td>
<td>.000</td>
<td>.002</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
</tr>
</tbody>
</table>

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

Table 4.7
*Pearson’s Product-moment Correlation Coefficient (r) between MSLQ and factors of PRO-SDLS*

<table>
<thead>
<tr>
<th>MSLQ Pearson Correlation</th>
<th>Initiative</th>
<th>Control</th>
<th>Self-Efficacy</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.054</td>
<td>.048</td>
</tr>
<tr>
<td>N</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
First, a Shapiro Wilk’s test on the descriptive data of participant age was significant, $W(104) = .84, p < .05$. This meant that my data were not normally distributed. Based on this information, I divided the age data set into quartiles: younger than 25 (Age Group 1), 25-27 (Age Group 2), 28-37 (Age Group 3), and 38 or older (Age Group 4). I ran an ANOVA, which showed PRO-SDLS scores did not differ significantly between age groups. To further examine this data, I split the sample in half by age, which created two groups based on the median age: age 27 and younger, and 28 and older. Again, ANOVA results showed PRO-SDLS scores were not significantly different between the two groups. Then, using the quartiles, I ran a MANOVA on each of the subscales. This produced evidence of main effects between PRO-SDLS scores. Table 4.8 shows the results of the MANOVA.

Because of the statistical significance in the main effect, I ran a post hoc test to determine which age groups differed significantly in factor subscale score. The Tukey post hoc test indicated self-efficacy scores differed significantly between two age groups $F(1,3) = 3.94, p < .05$. Participants in the third age group were between the ages of 28 and 37 ($M = 16.68, SE = .33$). Participants in the fourth age group were age 38 or over ($M = 18.25, SE = .33$). The mean difference between the two groups was $MD = -1.57, SE = .46$.

The Tukey post hoc test indicated a significant difference among age groups in the factor of motivation scale as well, $F(1,3) = 3.16, p < .05$. The first age group was composed of participants under the age of 25 ($M = 18.28, SE = .40$). Participants in the second age group were between the ages of 25 and 27 ($M = 17.08, SE = .41$). Participants in the third age group were between the ages of 28 and 37 ($M = 16.96, SE = .38$). In the fourth age group participants were over the age of 38 ($M = 16.71, SE = .38$). The mean difference between the first and second group was significant at $MD = 1.20, SE = .59$. The mean difference between the first and third
Table 4.8  
*Tests of Between-Subjects Effects: PRO-SDLS factor scores and Age in Groups*

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Groups</td>
<td>Initiative</td>
<td>33.35</td>
<td>3</td>
<td>11.12</td>
<td>.97</td>
<td>.41</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>14.19</td>
<td>3</td>
<td>4.73</td>
<td>1.06</td>
<td>.37</td>
</tr>
<tr>
<td></td>
<td>Self-efficacy</td>
<td>35.05</td>
<td>3</td>
<td>11.68</td>
<td>3.94</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Motivation</td>
<td>37.50</td>
<td>3</td>
<td>12.50</td>
<td>3.16</td>
<td>.03</td>
</tr>
</tbody>
</table>
group was significant at \( MD = 1.32, SE = .55 \). The mean difference between the first and fourth group was significant at \( MD = 1.56, SE = .55 \). These results indicated participants in the first age group of under the age of 25 scored significantly higher in motivation than the other three age groups.

Next, I examined variables of SDL and gender. An independent samples \( t \)-test between the composite PRO-SDLS score and gender resulted in no significant difference. However, a second independent samples \( t \)-test showed significant differences among gender and the factor scales of initiative, control, and self-efficacy, as shown in Table 4.9.

Within the initiative scale, the average score of male participants was \( M = 20.46, SD = 2.92 \). The average score of female participants was \( M = 18.90, SD = 3.47 \). The mean difference was significant \( (MD = 1.56, SE = .76), t(1, 103) = 2.07, p < .05 \). The results indicated that males scored higher than females on the initiative scale.

Within the control scale, the average score of male participants was \( M = 19.46, SD = 1.82 \). The average score of female participants was \( M = 20.51, SD = 2.15 \). The mean difference was significant \( (MD = -1.05, SE = .47), t(1, 103) = -2.23, p < .05 \). The negative difference in this subscale indicated that females scored higher than males.

Within the self-efficacy scale, the average score of male participants was \( M = 18.23, SD = 1.56 \). The average score of female participants was \( M = 17.29, SD = 1.81 \). The mean difference was significant \( (MD = .94, SE = .40), t(1, 103) = 2.37, p < .05 \). The results indicated that on average, men scored higher than women on the self-efficacy scale.
Table 4.9
Univariate Tests: PRO-SDLS and Gender

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contrast</td>
<td>47.78</td>
<td>1</td>
<td>47.78</td>
<td>4.28</td>
<td>.04</td>
</tr>
<tr>
<td>Error</td>
<td>1149.65</td>
<td>103</td>
<td>11.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contrast</td>
<td>21.35</td>
<td>1</td>
<td>21.35</td>
<td>4.97</td>
<td>.03</td>
</tr>
<tr>
<td>Error</td>
<td>442.21</td>
<td>103</td>
<td>4.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contrast</td>
<td>17.27</td>
<td>1</td>
<td>17.27</td>
<td>5.61</td>
<td>.02</td>
</tr>
<tr>
<td>Error</td>
<td>316.92</td>
<td>103</td>
<td>3.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contrast</td>
<td>11.80</td>
<td>1</td>
<td>11.80</td>
<td>2.86</td>
<td>.09</td>
</tr>
<tr>
<td>Error</td>
<td>425.25</td>
<td>103</td>
<td>4.13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The F tests the effect of Q6 - What is your gender?. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.
**Research Question 4:** Is there a significant relationship between self-regulated learning, age, and gender?

First, a Shapiro Wilk’s test on the descriptive data of participant age was significant, \( W(104) = .84, p < .05 \). This meant that my data were not normally distributed. To move forward with the analyses, I divided the age data set into quartiles: younger than 25 (Age Group 1), 25-27 (Age Group 2), 28-37 (Age Group 3), and 38 or older (Age Group 4). Based on an ANOVA, there was no significant difference between these ages and the composite MSLQ scores. To further examine this data, I split the age in half, which created two groups: age 27 and younger, or 28 and older. Again, there was no significant difference between age and MSLQ score. Next, again using the quartiles, I ran a MANOVA for the subscales of MSLQ. This test showed a main effect of significant difference between age in groups and the scales of intrinsic goal orientation (IGO), task value (TV), self-efficacy of learning and performance (SELP), organization (ORG), effort regulation (ER), peer learning (PL), and help seeking (HS). Table 4.10 shows the nine subscales with significant difference.

After determining the main effects, I ran a Tukey post hoc test to further understand the differences. This step required comparison among the four age groups and the 15 existing subscales of the MSLQ. As a result of this test, I discovered 14 instances of significant difference.

The Tukey post hoc test indicated intrinsic goal orientation scale scores differed significantly, \( F(1, 3) = 4.78, p < .05 \). Participants in the first age group were younger than 25 (\( M = 4.97, SD = 1.26 \)). Participants in the fourth age group were age 38 or over (\( M = 5.93, SD = .79 \)). The mean difference between the two groups was \( MD = -0.96, SE = .26 \). These results
Table 4.10
*Tests of Between Subjects Effects: Age in Groups by MSLQ Factor*

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Groups</td>
<td>IGO</td>
<td>12.75</td>
<td>3</td>
<td>4.25</td>
<td>4.78</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>EGO</td>
<td>12.08</td>
<td>3</td>
<td>4.03</td>
<td>2.64</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>TV</td>
<td>9.53</td>
<td>3</td>
<td>3.18</td>
<td>3.68</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>CLB</td>
<td>3.52</td>
<td>3</td>
<td>1.17</td>
<td>1.41</td>
<td>.25</td>
</tr>
<tr>
<td></td>
<td>SELP</td>
<td>9.15</td>
<td>3</td>
<td>3.05</td>
<td>3.70</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>TA</td>
<td>20.72</td>
<td>3</td>
<td>6.91</td>
<td>3.12</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>REH</td>
<td>8.29</td>
<td>3</td>
<td>2.77</td>
<td>1.65</td>
<td>.18</td>
</tr>
<tr>
<td></td>
<td>ELA</td>
<td>6.752</td>
<td>3</td>
<td>2.25</td>
<td>2.40</td>
<td>.07</td>
</tr>
<tr>
<td></td>
<td>ORG</td>
<td>21.34</td>
<td>3</td>
<td>7.11</td>
<td>4.02</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>10.45</td>
<td>3</td>
<td>3.48</td>
<td>2.37</td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td>MSR</td>
<td>3.79</td>
<td>3</td>
<td>1.26</td>
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indicated that on average, participants over the age of 38 scored higher than participants under the age of 25.

The Tukey post hoc test indicated intrinsic goal orientation scale scores differed significantly, $F(1, 3) = 4.78, p < .05$. Participants in the first age group were younger than 25 ($M = 4.97, SD = 1.26$). Participants in the fourth age group were age 38 or over ($M = 5.93, SD = .79$). The mean difference between the two groups was $MD = -0.96, SE = .26$. These results indicated that on average, participants over the age of 38 scored higher than participants under the age of 25.

The Tukey post hoc test indicated extrinsic goal orientation subscale scores differed significantly as well, $F(1,3) = 2.64, p < .05$. Participants in the third age group were between the ages of 28 and 37 ($M = 5.24, SD = 1.32$). Participants in the fourth age group were age 38 or over ($M = 4.35, SD = 1.34$). The mean difference between the two groups was $MD = 0.89, SE = .33$. These results indicated that participants age 28 through 37 scored higher on average than the participants over age 38.

Task value subscale scores differed significantly as well, $F(1,3) = 3.68, p < .05$. Participants in the first age group were younger than 25 ($M = 5.44, SD = 1.34$). Participants in the second age group were between the ages of 28 and 37 ($M = 6.15, SD = .94$). The mean difference between the two groups was $MD = -0.71, SE = .27$. Additionally, participants over the age of 38 ($M = 6.22, SD = .74$) had a mean difference with the first age group of $MD = -.78, SE = .25$. These results indicated that participants age 27 and younger scored lower on average than participants between ages 28 and 37, and participants 38 and older.

Self-efficacy of learning and performance subscale scores differed significantly, $F(1,3) = 3.70, p < .05$. Participants in the first age group were younger than 25 ($M = 5.36, SD = 1.21$).
Participants in the second age group were between the ages of 25 and 27 \((M = 6.13, SD = .62)\). The mean difference between the two groups was \(MD = -0.76, SE = .26\). Additionally, participants over the age of 38 \((M = 6.05, SD = .88)\) had a mean difference with the first age group of \(MD = -.69, SE = .25\). These results indicated that participants younger than 25 scored lower on average than participants between ages 25 and 37, and participants 38 and older.

Test anxiety subscale scores differed significantly as well, \(F(1,3) = 3.12, p < .05\).

Participants in the first age group were younger than 25 \((M = 4.58, SD = 1.70)\). Participants over the age of 38 \((M = 3.37, SD = 1.31)\) had a mean difference, with the first age group of \(MD = 1.20, SE = .41\). These results indicated that participants younger than 25 scored higher on average than participants age 38 and older. This means, on average, participants in the first age group had higher test anxiety than the participants in the fourth age group.

Organization subscale scores also differed significantly, \(F(1,3) = 3.68, p < .05\).

Participants in the second age group were between the ages of 25 and 27 \((M = 5.13, SD = 1.24)\). Participants in the third age group were between the ages of 28 and 37 \((M = 3.87, SD = 1.20)\). The mean difference between the two groups was \(MD = 1.26, SE = .37\). These results indicated that participants between ages 25 and 27 on average scored higher in organization than participants between the ages of 28 and 37.

The post hoc test also showed scores of the effort regulation subscale differed significantly between two age groups. Participants in the first age group were younger than 25 \((M = 5.32, SD = 1.18)\). Participants over the age of 38 \((M = 6.17, SD = .90)\) had a mean difference with the first age group of \(MD = -0.85, SE = .28\). These results indicated that participants younger than 25 scored lower on average than participants 38 and older.
The subscale of peer learning showed four statistically significant differences among groups, $F(1, 3) = 12.04, p < .05$. Participants in the first age group were younger than 25 ($M = 5.07, SD = 1.23$). Participants in the second group were age 25 through 27 ($M = 4.51, SD = 1.66$). Participants in the third group were age 28 through 37 ($M = 3.13, SD = 1.41$). Participants in the fourth group were age 38 and older ($M = 3.16, SD = 1.46$). The difference in the means of the first and third age groups were significantly different ($MD = 1.94, SE = .40$). The difference in the means of the first and fourth age groups were significantly different ($MD = 1.91, SE = .40$). The difference in the means of the second and third age groups were significantly different ($MD = 1.38, SE = .40$). The difference in the means of the second and fourth age groups were significantly different ($MD = 1.36, SE = .40$).

Scores on the help seeking subscale also differed significantly, $F(1,3) = 3.68, p < .05$. Participants in the second age group were between the ages of 25 and 27 ($M = 4.96, SD = 1.03$). Participants in the third age group were between the ages of 28 and 37 ($M = 4.02, SD = 1.28$). The mean difference between the two groups was 0.94, $SE = .32$. These results indicated that participants between ages 25 and 27 on average scored higher in peer learning than participants between the ages of 28 and 37.

Next, I examined the relationship between MSLQ and gender. An independent samples $t$-test between MSLQ scores and gender showed no significant relationship. I then ran a MANOVA to determine a relationship between the factor subscale scores and gender. As shown in Table 4.11, there were significant differences between the scores of men and women in the subscales of elaboration (ELA), metacognitive self-regulation (MSR), and effort regulation (ER). I ran an independent samples $t$-test to confirm differences between gender and each of the factor subscales with significant differences. The independent samples $t$-test showed that in the factor
subscale of elaboration, men scored an average of $M = 4.95, SE = .19$. Women scored an average of $M = 5.41, SE = .11$. The difference was significant ($MD = -.46, SE = .22$), $t(1, 103) = -1.84, p < .05$. These results indicated that on average, women scored higher than men in elaboration.

Next, I ran an independent samples $t$-test for the factor subscale of metacognitive self-regulation. Men scored an average of $M = 4.11, SE = .17$. Women scored an average of $M = 4.63, SE = .10$. The difference was significant ($MD = -.52, SE = .20$), $t(1, 103) = -2.59, p < .05$. These results indicated that on average, women scored higher than men in metacognitive self-regulation.

Then, I ran an independent samples $t$-test for the factor subscale of effort regulation. Men scored an average of $M = 4.99, SE = .20$. Women scored an average of $M = 5.95, SE = .11$. The difference was significant ($MD = -.96, SE = .22$), $t(1, 103) = -3.49, p < .05$. These results indicated that on average, women scored higher than men in effort regulation.

**Summary**

In this chapter, I provided the results of the data analyses. First, I provided an overview of the sample and descriptive statistics. Then, I discussed the two instruments used (PRO-SDLS and MSLQ), including the reliability of each, for this study. Next, I presented the four research questions and the corresponding test results. In Chapter Five, I interpret the findings relevant to this study and address implications for further research.
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The $F$ tests the effect of Q6 - What is your gender?. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.
Chapter Five

Summary and Conclusions

In Chapter One, I introduced this study, beginning with a quote from Virgil to illustrate the importance of self-perception in the realm of learning. Chapter Two provided a comprehensive review of relevant literature on self-directed learning (SDL) and self-regulated learning (SRL), including discussions of original theory, instruments, and connections between the two constructs. Chapter Three presented the research design and research questions, with information on the data collection procedure, population and sample overview, and data analysis. Then, in Chapter Four, I shared the data analysis results, including the descriptive statistical tests and multiple correlation outcomes. Chapter Five builds on the findings of the previous chapter. Here, I discuss the major findings as well as implications for practice and directions for future research. First, however, I offer a brief summary of the study.

Summary of the Study

The purpose of this study was to examine the relationship between SDL and SRL among adult learners in master’s education. The goal of this exploration was to contribute to a better understanding of similarities and differences between the constructs, as well as characteristics and learning processes of master’s students. Chapter Two illustrated the perception of some that SDL and SRL are fundamentally the same construct, but also included studies of both SDL and SRL in various educational settings with differing populations and results. While both constructs are widely used and studied in educational psychology and adult learning, no study to date has directly compared self-directed to self-regulated learning with data analysis from the PRO-SDLS and MSLQ instruments. Chapter Two indicated that SDL and SRL share the constructs of self-efficacy, motivation, and control. The similarities between the two theories have contributed to
some ambiguity about the difference in terms. Therefore, this study was created to add to extant literature on further distinguishing SDL and SRL, especially regarding a relationship with current master’s students.

After receiving approval from the Institutional Review Board, I contacted specific administrative staff and faculty for permission from the appropriate individuals in each college. These staff and faculty forwarded the text of a consent form and a link to a QuestionPro survey to all students in the departmental master’s programs ($N = 1,050$). These students were current students enrolled in one of 13 master’s programs in the College of Business, College of Social Work, and College of Education, Health, and Human Sciences. By clicking on the link, the prospective participant would again see the Informed Consent Statement (see Appendix C). At the bottom of the statement was a button labeled “Continue.” By selecting this button, the participant gave consent to participate, as per the Informed Consent Statement. The first question asked the participants if they were current master’s students, with the option to select “yes” or “no.” After this question, the participants began the 25-item PRO-SDLS, followed by the 81-item MSLQ. To conclude the survey, participants were asked to input demographic information on age and gender.

The data collection period ended, and the survey link was closed on June 18, 2020. The QuestionPro analytics stated that 111 participants completed surveys. However, six of those were removed due to missing answers. The resulting total number of surveys used for data analysis was 105, for a return rate of 10%. Data were exported from QuestionPro to SPSS for analysis. From the sample, demographic analysis provided $M_{age} = 32.5$, with the ages ranging from 22 to 72. A large majority of participants were female at 75.2%, and 24.8% were male.
The mean PRO-SDLS score was 93.39, indicating that the score could range from 25 to 125. The mean of the MSLQ composite score was 4.99, indicating that the score could range from 1 to 7. As discussed in Chapter Four, score comparisons from other studies showed that the results for this sample were similar to previous studies.

**Major Findings**

For this study, I developed four research questions to explore the relationships of these data. In this section, I present the major findings of this study in support of these questions.

1. **Research Question 1** asked if there is a significant relationship between the constructs of SDL and SRL in current master’s students. For this study, there was a significant positive correlation between the composite scores of the PRO-SDLS and the MSLQ \( (r = .55, p < .05) \). The coefficient of determination \( (r^2 = .31) \) indicated that 31% of the variance in participants’ SDL could be attributed to SRL.

2. **Research Question 2** asked if there are significant relationships among the factors of the PRO-SDLS and the factors of the MSLQ. The correlation results of the existing factor subscales between the two scales showed a number of statistically significant relationships. Nine MSLQ factor subscales, more than half, showed some level of significant relationship with multiple factor subscales of the PRO-SDLS. This included four factor subscales from the motivation section and five from the learning strategies section. From the existing factors of the PRO-SDLS scale, initiative was significantly related to 10 existing factors of the MSLQ, control was significantly related to nine factors, self-efficacy was significantly related to one factor, and motivation was significantly related to six factors. See Appendix E for further detail.
3. Research Question 3 asked if there is a significant relationship between SDL and age, and SDL and gender. First, there was no statistically significant relationship between composite PRO-SDLS score and age. However, there was significant difference among age in groups in the subscales of self-efficacy and motivation. Additionally, there was no statistically significant relationship between composite PRO-SDLS score and gender, but there were significant differences between genders in the subscales of initiative $t(103) = 2.07, p < .05$, control $t(103) = -2.23, p < .05$, and self-efficacy $t(103) = 2.37, p < .05$.

4. Research Question 4 asked if there is a significant relationship between SRL and age, and SRL and gender. First, there was no statistically significant relationship between composite MSLQ score and age. However, there was a significant difference among age in groups in the following nine subscales: intrinsic goal orientation, extrinsic goal orientation, task value, self-efficacy of learning and performance, test anxiety, organization, effort regulation, peer learning, and help seeking. Additionally, there was no statistically significant relationship between composite MSLQ score and gender, but there were significant differences between genders in the subscales of elaboration $t(103) = -1.84, p < .05$, metacognitive self-regulation $t(103) = -2.59, p < .05$, and effort regulation $t(103) = -3.49, p < .05$.

**Discussion**

Having confidence in one’s own abilities makes one less susceptible to external determinants. The question that naturally follows might be, in what ways can learners build that self-efficacy? Two concepts that can assist in personal empowerment include SDL and SRL. A strength of individuals with self-regulation is the goal of attaining a personal “golden mean” (Niemiec & McGrath, 2019, p. 219) through management of feelings and actions, thus creating a
life with “balance, order, and progress” (p. 211). Specific to the concept of SRL, these individuals regulate the functionality of personal cognition and affect as part of the learning process, with consideration of proactive and reactive measures (Zimmerman & Schunk, 2008). This regulatory process is not causal and is thus motivated by commitment to a subject or task of interest. SDL exists when an individual exhibits a certain level of initiative surrounding a learning endeavor, decides to control and evaluate the learning, believes in the ability and likelihood of success, and demonstrates motivation to persist in completing the learning experience (Brockett & Hiemstra, 1991).

Similarities emerged, such as relationships between existing factors of SDL and SRL, as well as differences in age and gender for many of the factors. In this discussion section I address ways in which the two areas can be understood as separate constructs that act in harmony toward a unified goal of solidifying and strengthening learning processes.

**SDL and SRL**

As mentioned in Chapter Four, there was a significant correlation between the composite scores of the PRO-SDLS and the MSLQ ($r = .55$, $p < .05$). By squaring the Pearson’s $r$ value, the coefficient of determination ($r^2$) indicates the variance shared by the two constructs being analyzed. In this case, the constructs are SDL and SRL, through the specified instruments. Through this equation, it was determined that 30% of the variance in participants’ self-directedness can be attributed to self-regulation in learning for current master’s students. Therefore, for this sample, there was a large correlation between the two composite scores, indicating a strong relationship between SDL and SRL.

While the relationship was strong, it was not so strong as to indicate the measurement of two almost identical constructs. I found this to be an exciting revelation, supporting my premise
that SDL and SRL are not, in fact, the same theory expressed through differing syntax. The following sections provide further information on the various interactions between the subscale levels of the PRO-SDLS and the MSLQ, as well as demographic influence.

**SDL and Factors of SRL**

The composite PRO-SDLS score had a significant relationship with 10 of the 15 MSLQ subscales. These factors were intrinsic goal orientation, task value, control of learning beliefs, self-efficacy of learning and performance, elaboration, organization, critical thinking, metacognitive self-regulation, time and study environment, and effort regulation. This result again supports the finding that while SDL and SRL are certainly related, they are not the same concept. The subscales in which there was no significant relationship provide as much support to this statement as the factors that do have the significant relationship. The five subscales missing were extrinsic goal orientation, test anxiety, rehearsal, peer learning, and help seeking. Let us consider each of these factors, which were developed by the instrument creators.

Extrinsic goal orientation indicates that motivation pertaining to a specific learning process is a means to an end (Pintrich et al., 1991). Test anxiety is an affective motivational component indicative of worry and negative emotions attached to the specific learning process. Rehearsal is a learning strategy that is more akin to memorization and short-term memory, as it does not enhance long-term memory, connections, or integration. Peer learning is a learning strategy factor that focuses more on the integration of collaboration in the learning process, making it a more collective experience. Help seeking is a similar learning strategy, a factor linked to obtaining assistance from other individuals in a learning capacity.

The two strongest correlational factor subscales of the MSLQ with the composite PRO-SDLS score for this study were intrinsic goal orientation \((r = .55, p < .05)\) and task value \((r = \)
.53, \( p < .05 \)). As the variance accounted for, intrinsic goal orientation accounts for 30% of the variance in SDL, and task value accounts for 28% of the variance in SDL. I was fascinated by this finding as the two MSLQ factors both provide insight into the value of the participant.

The participants who were highly self-directed were also likely to find value in the process of learning and the tasks associated with that process. Therefore, interest in SDL (Brockett & Hiemstra, 1991; Candy, 1991; Merriam & Baumgartner, 2020; Ruttencutter, 2018) and intrinsic motivation in SRL function similarly. These factors can lead to learning autonomy (Reeve et al., 2008; Wigfield et al., 2008), self-efficacy (Hidi & Ainley, 2008), and academic performance (Pintrich & De Groot, 1990). Essentially, the broadest connection between SDL and SRL appears to be through the driving factor of interest, specifically to an individual’s love of learning.

**SRL and Factors of SDL**

The composite MSLQ score had a statistically significant relationship with three of the four subscales of the PRO-SDLS. Initiative (\( r = .50, p < .05 \)), control (\( r = .41, p < .05 \)), and motivation (\( r = -.19, p < .05 \)) each showed a significant relationship, while self-efficacy did not.

The subscale of initiative had a large effect size (\( r = .50 \)), a strong positive relationship, and accounts for 25% of variance in the MSLQ score. The subscale of control had a medium effect size (\( r = .41 \)) and strong positive relationship, accounting for 17% of variance in the MSLQ.

The PRO-SDLS factor subscale of motivation indicated a negative correlation with composite MSLQ score (\( r = -.19, p < .05 \)). This factor represented the weakest of the three significantly related subscales, accounting for 4% in variance. This, while significant, is a small effect of variance. It is possible that this relationship is due to the working use of the term
“motivation.” The MSLQ measures motivation as a construct that works collaboratively with SRL. The motivation subscale combines value, expectancy, and affective components. The PRO-SDLS measures motivation as a learner characteristic. Additionally, it is possible that this result is uniquely exclusive to this sample, as the study reported 95% certainty in this result.

**SDL, Age, and Gender**

This study examined SDL with age and gender. For this sample, there was no significant relationship between age and SDL score. While previous studies have found some significance, typically the relationship has a weak to modest effect (Conner, 2012; Fogerson, 2005; Ruttencutter, 2018; Stockdale & Brockett, 2011). Additionally, there was no significant relationship with the SDL score and gender. These findings are similar to previous studies, as Hall (2011), Holt (2011), and Ruttencutter (2018) found no significant relationship between overall SDL score and gender. This lack of significant results prompted me to examine the factors with age and gender.

There was evidence of significance among the demographic variables and subscales of the PRO-SDLS. There was a significant difference by gender in three out of the four subscales. In the factor scale of initiative for this sample, $t(103) = 2.07, p < .05$, males scored higher than females. This is similar to the findings of Holt (2011) in which males had higher initiative $t(488.97) = 3.67, p < .001$. The current study also found significant difference in the scales of control $t(1, 103) = -2.23, p < .05$, in which females scored higher than males, and self-efficacy $t(1,103) = 2.37, p < .05$, in which males scored higher than females. There was no significant difference by gender in the scale of motivation. Because the majority of the participants were female ($n = 79$), the scales in which the males scored higher perhaps suggest that males in master’s programs, on average, have a higher belief in personal ability as well as a higher level
of personal responsibility regarding education and the learning process (Bandura, 1977; Stockdale & Brockett, 2011). Women scored higher in control, which suggests that females on average are adept at developing a learning environment that is effective. Decisions and choices linked to the factor of control lead to learning that is more interactive and transactional in nature (Brockett & Hiemstra, 1991; Stockdale & Brockett, 2011). It seems that females are likely to create relationships to enhance the learning process. In other words, they make learning personal.

The analysis showed a significant difference by age in the subscale of self-efficacy. Between the group of participants between ages 28 and 37 with the group of participants over the age of 38, the difference was significant, \( MD = -1.57, SE = .46 \). As shown in Figure 5.1, this result indicated that the oldest age group of participants scored higher in self-efficacy than all other age groups, but the difference was only significant in one instance. While the finding that the oldest participants scored highly in self-efficacy was expected, the significant difference between the third and fourth age group was a surprise. A possible suggestion for this could be that the participants between the ages of 28 and 37 have more responsibilities at home that take away the level of certainty in which they expect to succeed. Perhaps these individuals are raising toddlers and balancing full-time work while also pursuing a master’s degree. These life events may create an aspect of doubt, leading to a lower score in the factor of self-efficacy.

There was also a significant difference by age in the scale of motivation. This difference was intriguing. As shown in Figure 5.2, the participants under 25 (Age Group 1) scored significantly higher than all three other age groups. The figure also illustrates how motivation score for this sample decreased by age. I suspect that this comes from the feeling of younger learners’ belief that further education is a choice, while older learners may feel more of a need for a master’s degree to advance in a chosen career field. Perhaps the occurrence of decrease in
Figure 5.1 PRO-SDLS factor of self-efficacy scores by age in group

Figure 5.2 PRO-SDLS factor of motivation by age in groups
motivation by age can shed some light on the negative correlation between motivation and the composite MSLQ.

Ultimately, this study provided some instances in which variables of age and gender did impact PRO-SDLS factor subscale scores to various degrees, significant and otherwise. This contrasts with the lack of significance between the composite PRO-SDLS score and age or gender. I believe this extra investigation showed relationships that are valuable to understanding how SDL interacts with demographic variables.

**SRL, Age, and Gender**

This study also examined SRL with age and gender. For this sample, there was no significant relationship between age and SRL. While the significance is not apparent in the composite score, age and gender present some differences in MSLQ subscale scores.

Females scored significantly higher than males in elaboration, metacognitive self-regulation, and effort regulation. This supports Meece and Painter’s (2008) findings that females are more likely to use SRL strategies than males. Elaboration strategies, such as note taking, summarizing, and creating analogies, are used to store information for long-term memory and strengthen the connection between new and prior information (Pintrich et al., 1991). Metacognitive self-regulation strategies involve the control of activities and the adaptation of behavior throughout the progression of a learning task (Pintrich et al., 1991). Effort regulation strategies include essentially a control of effort, or self-management through commitment to personal learning goals despite challenges in the learning process.

The youngest age group scored higher than the three other age groups in two subscales: test anxiety and peer learning. I suspect part of this difference in score by age group can be
attributed to the more recent pursuit of undergraduate education in the younger participants. The learning strategies may be easy to recall and carry over into master’s programs.

Participants over the age of 38 (Age Group 4), scored higher than participants under age 25 (Age Group 1) on three subscales: task value, self-efficacy of learning and performance, and effort regulation. Task value is a factor on the motivation subscale of the MSLQ. This factor measures “students’ perceptions of course material in terms of interest, importance, and utility” (Pintrich et al., 1991, p. 12). Self-efficacy of learning performance is a motivational factor that assesses expectancy of a learner. This factor includes measurement of judgment and confidence in personal performance and ability (Pintrich et al., 1991). Effort regulation, an MSLQ factor of learning strategies, includes essentially a control of effort, or self-management through commitment to personal learning goals despite challenges in the learning process.

Significant differences in age groups also occurred in the subscales of organization, peer learning, and help seeking. Participants between the ages of 25 and 28 scored significantly higher, on average, than participants between the ages of 28 and 37 in those three learning strategies subscales. This significance may indicate some intrinsic shift in the use of learning strategies and perception of education based on external factors. It is possible that families are more of a priority with the participants between 28 and 37, thus resulting in less time to devote to the higher commitment strategies or social aspect of education. Organization is an active, cognitive strategy that allows the learner in-depth engagement with the learning process. This strategy includes developing outlines and identifying main ideas in literature (Pintrich et al., 1991). Peer learning is a strategy that involves the management of resources, collaborating and communicating with colleagues for further understanding in a learning process (Pintrich et al., 1991). Help seeking is another method of resource management. Participants who scored high in
this area are likely capable of identifying others who can assist in understanding challenging materials.

Despite the lack of significance between the composite MSLQ score and demographic questions, age and gender did significantly impact SRL factor subscale scores in this study. The extra analysis provided information on interaction between age groups and gender that can be helpful to understanding how SRL occurs in master’s students.

**Implications for Practice**

The MSLQ was designed to investigate motivation and learning strategies as it pertained to one class. It is often used to identify relationships between the two subscales and academic performance, whether by correlation with test scores or overall course scores. This is indicative of an assumption on the part of the creators that learning strategies can be adapted over time and in response to different needs in learning environments (Duncan & McKeachie, 2005; Wolters, 2003). Previous scholars have indicated that SRL exists differently among different levels of education (Panadero, 2017). As educational experience increases, the need for metacognitive strategies becomes more necessary. However, according to Moos and Ringdal (2012), higher education instructors tend to focus more on course content than learning opportunity for SRL. These skills and strategies improve over time with practice and reflection (Zimmerman & Kitsantas, 2005). Incorporation of such techniques into a higher education makes sense, as SRL can be indicative of academic performance.

SDL and SRL have a strong relationship. Therefore, the practical implications from this study essentially incorporate the application of tools for employing either construct for development in master’s students. In this section, I suggest ways that this relationship can be used for educating master’s students.
Self-regulation and SRL depend on a large amount of metacognitive control. Having a thorough understanding of what an individual finds motivating and interesting or knowing the circumstances under which an individual is willing to subdue impulses can be beneficial in the strengthening of this academic muscle. Development of master’s programs that depend on the metacognitive capacities of a learner can be a form of strength training. Learners will gradually gain more experience from the learning process if the educators are intentional about encouraging strategies that facilitate such development. Based on individualistic skill and strength, intentionality can lead to increased academic performance, retention, and well-being of educators and learners alike. This sentiment aligns closely with the Chapter One opening quote from Virgil: as the students enhance their learning capacity, self-efficacy grows. Belief in oneself and one’s own ability leads to internal motivation for the pursuit of learning goals (Peterson & Seligman, 2004).

Likewise, SDL occurring as either a personal characteristic or learning process stems from intrinsic origins, such as autonomy, motivation, and personal belief (Brockett & Hiemstra, 1991). The individual is not at the center of the concept but does effectively place meaning on surrounding social contexts and learning processes. The meaning-making by the learner ultimately creates connections in the learning environment that will impact the entire experience. While meaning-making can occur collaboratively, the impetus is certainly on the intrinsic strategies that take place for each unique individual. Self-efficacy in self-directedness is therefore instrumental to the process. In this sample, the scale of self-efficacy in SDL was significantly impacted by age and gender. This finding suggests that the incorporation of self-efficacy techniques can be beneficial to a wide variety of learners.
Additionally, this study reinforced the conclusion that all learners have different levels of SDL (Brockett & Hiemstra, 1991). There is no blanket statement that can be made to imply that age or gender has any impact on overall levels of SDL. This lack of definitive relationship supports the implication that all learners can benefit from the incorporation of SDL practice in higher education, especially if, as found by previous studies, “self-directed learning is desirable for most adults” (Brockett and Hiemstra, 1991, p. 92) and often occurs naturally (Guglielmino, 2008). The most effective way of learning for adults should be taken into consideration when developing curricula.

Encouraging learner autonomy and facilitating interest to promote motivation is not a new implication for practice. Schunk et al. (2014) explored mastery motivation theory application in classrooms, as well as using community members as motivational support. Mullen (2011) discussed the facilitation and development of SRL in doctoral students through mentoring. The lack of implications specifically focused on master’s students implores me to suggest the importance of developing curriculum and programs that promote intrinsic motivation and interest for learners who love to learn.

The findings of this study draw a direct connection between SDL and SRL through an individual’s love of learning. Imagine, then, what an educator can do by harnessing the passion and interest of learners. Instead of placing an emphasis on the course content, focus on the act of learning. Design a course in which the learners perform tasks in which they are encouraged to thrive while becoming more autonomous in the learning process.

The nature of a master’s program is such that the learner is often pursuing a degree in which one holds an interest or finds relevant. Typically, unlike undergraduate programs, master’s
programs emphasize learning of one main topic with related subject matters. This environment can foster rich growth of self-directedness, self-regulation, and the related factors.

To disseminate the findings of this research in future teaching settings, the use of the PRO-SDLS and MSLQ may provide an interesting introduction. Further discussion about how the instruments are designed and used can give students a working idea of how survey research occurs in learning settings. Then, study on the learning theories behind each survey will give a solid foundation for the incorporation and implementation of learning strategies for adult learners. Drawing attention to learner characteristics and metacognitive strategies that enhance the learner’s experience will give a tangible, relevant experience allowing learners to see the theories in action. Then, learners can practice reflection and reflexivity by considering what works for a diverse group of individuals in one learning environment.

Directions for Future Research

The rationale behind developing this research study was to better understand the connection between SDL and SRL. As mentioned previously, no studies to date have examined the relationship of SDL and SRL in master’s students. Using the PRO-SDLS and the MSLQ, this study is but the starting point for understanding how the areas interact. There is much more that can be encompassed. In this section, I outline five examples for research moving forward.

Diversified and Stratified Population

This study focused on current master’s students in the College of Business, the College of Social Work, and the College of Education, Health, and Human Sciences at one large public university. This choice encompassed many different master’s programs with varying individual and social contexts. However, it would be interesting to designate some investigative capacity to social contexts and backgrounds, which ties into the social context dimension of Hiemstra and
Brockett’s model. By expanding the population to include other educational programs, and ensuring the representation of a widely diverse population, the results could be more generalizable.

**Age Stratification**

This study also reported considerable results based on significant differences in age groups. As presented in Chapter Four, the median age of participants was 28, but the age range was between 22 and 72. While the group sizes were similar, more participants of older ages would be desirable in producing stronger, more generalizable outcomes. I would like to see data to support such findings that age variation has an impact on scale factors.

**Critical Exploration**

Inherent in any way of learning is a way of knowing. As such, the use of a critical lens can strengthen the understanding of how these two specific constructs exist within various organizational systems. Determining to understand and illustrate how power comes into play in these contexts are imperative to a system that seeks to be accepting and inclusive. As presented in Chapter Four, differences do exist among genders and age. For this study, I did not inquire about cultural or ethnic backgrounds, which could add another level of investigation. Scholars have argued that the concepts of individualism are stereotypically masculine but not accurately representative. Additionally, research has shown that some students do not have a high correlation between learning perception and actual achievement (Graham, 1994). “If students believe they are learning when they are not” (Pintrich et al., 2000, p. 90), it is unlikely that they will have the SDL and SRL experience to develop an effective learning process. By considering multiple paradigms and the intersectionality of lived experiences, SDL and SRL can be used as tools for social justice, to empower learners and break away from the banking of education.
(Freire, 1970). Through a consciousness of intersectional dimensions of power, using such critical lenses for action in education reform “can result in new and powerful perspectives on social inequality” (Collins & Bilge, 2016, p. 162).

**Social Context**

Traditional theories of education and theories regarding “self” are structured such that the individual is separate from the surrounding social context. Some scholars argue that the myth of individualism perpetuates a mentality that personal fulfilment comes at the expense of the community (Jackson, McKenzie, & Hobfoll, 2000). Acknowledging that individuals have different lived experiences based on historical and social context allows scholars a more robust understanding of how SDL and SRL are exhibited. Jackson et al. state that SDL is embedded within the context of a social setting, which corresponds with Hiemstra and Brockett’s (2012) updated SDL model. The construct of SRL is grounded in social cognitive theory, but largely emphasizes the individual’s creation of learning processes within a given environment. The environment becomes irrelevant, encouraging a dismissal of “contextual affordances and constraints” (Pintrich, 2000, p. 493). It also supports the inclusion of the time and study environment factor of MSLQ.

While it has been repeated time and again that social context is integrated into these two individualistic theories, further research should be done to learn more about the significant impact of culture, gender, and power on personal factors. Collectivist perspectives may provide a different approach to SRL in a non-Western, communal sense (Pintrich, 2000). Further research, perhaps expanding on Hadwin et al.’s (1991) SSRL model, may foster a greater understanding of a “self-in-social-setting” (Jackson et al., 2000, p. 294) approach to regulation.
Qualitative Research Methods

Research in the fields of SDL and SRL are resoundingly quantitative. These studies have set a very good stage for further investigation. My research questions were designed in a way that could best be answered quantitatively. However, there are constructs in learning processes and learner characteristics that cannot be measured with numbers but instead must be obtained in other ways. Observations, interviews, and narrative inquiry may all be extremely insightful to further understanding the existence and embodiment of SDL and SRL. This would also clarify how context impacts learning processes (Pintrich, 2000). These methods of research would utilize different questions to explore different areas of the fields that are just as relevant and valuable to understanding how these constructs interact.

“All scientific thinking is a mixture of quantitative and qualitative thinking” (Stake, 2010, p. 13), so making this research shift from quantitative to a qualitative or a mixed methods approach can be seamless. Qualitative research can address how learners make meaning of lived experiences in a way that quantitative research does not. A qualitative approach allows for more particular investigation, incorporation of individualistic activity, and an attempt to understand such phenomena (Stake, 2010). The mixed methods approach allows a “confirmatory and exploratory” (Miles & Huberman, 1984, p. 21) study result. The purpose of a subsequent mixed methods approach is to examine SDL and SRL among master’s students and explore how these learning processes impact the graduate learning experience.

Longitudinal Study

As metacognitive strategies have been shown to change over time, a longitudinal study would provide more information on how such changes occur (Schneider & Pressley, 1989). This would provide an advantage over comparisons by age. Inherent in such a study would be the
control of participants, as backgrounds would remain the same, but time and experience may impact results (Kasworm, 2011). Both SDL and SRL could be measured via pre- and post-tests. For example, the pre-test could be given upon entrance into a master’s program. The survey could be given at some point during the master’s education. Then a post-test could be given after graduation. These three points of measurement would provide further data on learning strategies, including a deeper understanding of how SDL and SRL interact in master’s students over time. Additionally, this type of research could guide selection of measurements and instruments used for participants of different ages (Pintrich et al, 2000).

**Conclusion**

As the COVID-19 pandemic has rocked our nation and the world to its core, educators and learners alike can find immediate relevance in this study. I believe master’s programs that accommodate adults and empower them to grow into more creative and autonomous learners, with the incorporation of learning strategies, can improve the current climate of education. When I began this study, I was passionate about understanding learning processes for adults in various learning environments. Now, with the strong push toward remote and online learning, the adult learner has even more pressure to not only achieve academic goals, but to also balance a new way of existing in the home. Unprecedented barriers are emerging, and stressors are rising, but adults continue to pursue education. As such, educational experiences that promote self-efficacy, intrinsic motivation, self-control, and initiative in learning can encourage academic success as well as overall self-confidence.

As suggested by Virgil, one’s possession of motivation and self-efficacy may give one the power to learn. The most surprising finding from this study to me was that, in this sample, self-efficacy and motivation were impacted by age, but not in the way I expected. The
relationship was not progressive in either case. While the sample is not large enough to
generalize, I can soundly say that, in this study, older master’s students and younger master’s
students do not differ in these two factors as much as I anticipated. Additionally, this study has
provided evidence that SDL and SRL are strongly related through the concepts of interest and
love of learning. Through that connection, one may find academic success and share it with
others. This study brings literature specifically addressing the connection between SDL and SRL,
while indicating that the theories are not identical. From these results, I provided implications for
practice such as development of master’s programs that include opportunity for exercising SDL
and SRL. I also indicated five lines of further research, including specific population parameters,
incorporation of critical lenses and social context, and the use of qualitative research.
References


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doi:10.5367/000000053123600


doi:10.1080/03075079.2015.1076780


doi:10.1155/2012/423284


doi:10.1080/13562517.2017.1379480


Appendices
Appendix A

Permission to collect data

College of Education, Health, and Human Sciences

Raynor, Hollie Anne <hraynor@urtk.edu> 
Jan 31, 2020, 11:04 AM

I have – here are all the contacts for each department:

  TPTE – the department head, Sherry Bell
  CFS – staff, Sonja Spell
  PH – staff, Wendy Smith
  NUTR – staff, Pam Cash
  EPC – staff, Whitney Denton
  ELP – faculty, Pam Angele and staff, Michelle Passamonte
  RTM – staff, Marcia Johnson
  KRIS – faculty, Lars Dzikus

All department heads have given their approval to contact these individuals to give them your email to send out to graduate students. Good luck!

Hollie

On 12/4/19 1:51 PM, Linkous, Holley Marie wrote:

Good afternoon, Colleen,

I am wanting to survey the graduate students in CEHHS. I recently met with Dr. Raynor to see what might be the best way to do this in the most protected manner, as there is no list serv for the college of all graduate students. Her suggestion was that she reach out to the department heads for approval. If a Department Head agreed, I would then be put in contact with the Administrative Assistant of that department, and they would send out the email to their students. This would allow me to disburse the survey without gaining any confidential or protected information about the students.

I have copied her on this email, so if this sounds like an acceptable method from an IRB standpoint, please let me know.

Thank you so much for your assistance!

Holley

Institutional Review Board <irbchair@urtk.edu> 
Tue, Dec 10, 2019, 7:17 AM

Hi, Hollie and Hollie.

That will work!

Colleen
Professional Master of Business Administration

From: Topley, Ruth <topley@utk.edu>
Sent: Friday, January 11, 2019 10:50 AM
To: Linkous, Holley Marie <haham1@vols.utk.edu>
Cc: Kinard, Molly <molly@utk.edu>
Subject: RE: Question about possible dissertation planning :)  

Hi Holley,

So sorry it’s taken so long to get back to you but with the rush of graduation and the holiday break this got pushed back. The good news is yes, we’d be happy to help. When you are ready you send can send me something to send to the class (an explanation of what you are asking and why) and then you can come to class on an agreed upon Saturday to do the survey.

As far as eligible faculty members... you can feel free to reach out to whomever you like. Srinii is still here but I don’t think Tom Cevone would be eligible and he no longer works year.

Good for you Holley for always moving forward!

Ruth

---

Ruth Topley
Program Manager, Professional MBA Program
Graduate & Executive Education

Topley, Ruth <topley@utk.edu>  
to Brandon, Kyle, David, Crystal, Matthew, Jackson, Tara, Erin, David, Aaron, Adam, Sarah, Michael, Adrian, Adam, Damien, Erin, Rebecca, Jason, Constance, Mr.  
Class,
We would most appreciate you taking just 15 minutes to help a ProMBA graduate who is currently working on her PhD by completing a quick survey. Please see below.

Thanks so much for your support!
Ruth

---

College of Social Work

Nugent, Bill <bnugent@utk.edu>  
to Lori, Sherry, me  
Hi Holley,

I am not the person you need to contact about this. I am forwarding your email to Dr. Lori Messinger, our Dean, and Dr. Sherry Cummings, our Associate Dean. You will need permission from them.

Good luck with your research!

Dr. Nugent

---

From: Linkous, Holley <haham1@vols.utk.edu>
Sent: Friday, May 8, 2020 8:10 PM
To: Nugent, Bill <bnugent@utk.edu>
Subject: Requesting assistance with survey distribution for dissertation

---

Cummings, Sherry M <scumming@utk.edu>  
to Jennifer, Bill, me, Lori  
Holley: yes this will be fine. Pls email Jen Scagnelli. She can send out an email to all our MSSW students.

Sherry Cummings
Associate Dean for Academic Affairs
UTCSSW
Hi Hollay,

Congrats on receiving IRB approval! Yes, I think the best thing is for you to send me the text and survey link you would like students to receive. I will then copy and paste into an email and ensure our different graduate student groups receive it.

Tara

Tara Mohrfield, PhD
Director, Academic and Student Services
Graduate Business Programs
Haslam College of Business
University of Tennessee, Knoxville
865-974-1774 (D)
865-963-7171 (C)
Appendix B

Instrument Permission

PRO-SDLS – Susan Stockdale

---

Request for permission to use PRO-SDLS

Linkous, Holley <hsharp1@vols.utk.edu>

to sstockda

Tue, Feb 4, 2020, 10:12 AM (10 days ago)

Good morning Susan,

My name is Holley Linkous. I'm a doctoral candidate in Adult Learning at UTK (and current student of Ralph's).

I am contacting you to ask permission in using the PRO-SDLS for my dissertation study. The purpose of my study is to examine the relationship between SDL and self-regulated learning among adult learners in their graduate level education. Given the context of the learners, the PRO-SDLS is the suitable instrument.

If you have a moment, I would appreciate if you can let me know if I may use your instrument for this study.

If you have any questions, please reach out to me.

Thank you very much,

Holley Linkous
PhD Candidate, Adult Learning
Graduate Research Assistant
Educational Psychology and Counseling
University of Tennessee, Knoxville

hsharp1@vols.utk.edu

---

Susan Stockdale via vols.utk.edu

to me

Feb 5, 2020, 8:05 AM (9 days ago)

Of course. Do you need a copy?

Susan

---

On Feb 4, 2020, at 10:12 AM, Linkous, Holley <hsharp1@vols.utk.edu> wrote:

---

Linkous, Holley <hsharp1@vols.utk.edu>

to Susan

Feb 9, 2020, 8:33 PM (5 days ago)

Actually, that would be great, if you have it available!

Thank you so much!

All the best,

Holley Linkous

---
Appendix C

Informed Consent Statement

The strength of self: An examination of self-directed learning and self-regulated learning among master’s students

INTRODUCTION
This email is to invite you, as a graduate student in the University of Tennessee Knoxville’s College of Education, Health, and Human Services, College of Social Work, or College of Business, to participate in a research study.

My name is Holley Linkous, and I am a PhD candidate in Educational Psychology & Research at UTK. I am conducting my dissertation research on master’s students within the College of Education, Health, and Human Services, College of Social Work, and the College of Business.

The purpose of this study is to examine the relationship between self-directed learning and self-regulated learning among adult learners in their master’s education. An analysis of this relationship will contribute to the body of knowledge that bridges the gap between self-directed and self-regulated learning, as well as build on information pertaining to master’s student self-guided learning techniques.

Your anonymous participation in this research study includes taking an online survey about your self-regulation and self-direction in learning and demographic items of age and gender.

INFORMATION ABOUT PARTICIPANTS’ INVOLVEMENT IN THE STUDY
If you choose to participate in this study, you will follow the link at the end of this email. By clicking on that link you will be consenting to participate in this study. However, at any time while taking the survey you may elect to withdraw your participation.

Your participation is limited to completing this survey one time. Once you enter the study, it will take less than 15 minutes to complete. Also, you can complete the survey on your laptop or a mobile device.

RISKS
For this study there are no foreseeable risks other than those encountered in daily life.

BENEFITS
While there are minimal direct benefits to you for participating in the study, gathered information will contribute to the understanding of learning and motivation in adult learning in graduate level education.

CONFIDENTIALITY
The anonymous data collected from this study will be kept confidential. The data will be stored securely on the researcher’s password-protected laptop. Data will only be made available to me as the researcher, and my major advisor, unless participants specifically give permission in writing to do otherwise. No reference will be made in oral or written reports that could link
participants to this study.

CONTACT INFORMATION
If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study,) you may contact the researcher, Holley Linkous, at hsharp1@vols.utk.edu, and 865-469-7677 or my advisor, Dr. Ralph Brockett at brockett@utk.edu. If you have questions about your rights as a participant, you may contact the University of Tennessee IRB Compliance Officer at utkirb@utk.edu or (865) 974-7697.

PARTICIPATION
Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be removed and will not be used in data analyses. Once the survey has been submitted, I will not be able to remove your responses because I will not know which data came from your survey.

CONSENT
I have read the above information. I have received a copy of this form. I agree to participate in this study.
By clicking on the following link, you are consenting to participate in this research study:
Appendix D

IRB Approval Letter

April 09, 2020

Holley Linkous

UTK - Educational Psych & Couns

Re: UTK IRB-20-05809-XM

Study Title: Examining the Relationship Between Self-Directed Learning and Self-Regulated Learning

Dear Holley Linkous:

The Human Research Protections Program (HRPP) reviewed your application for the above referenced project and determined that your application is eligible for exempt review under 45 CFR 46.101. Category 2: Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: i. The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects; ii. Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or iii. The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by .111(a)(7).

Your application has been determined to comply with proper consideration for the rights and welfare of human subjects and the regulatory requirements for the protection of human subjects. This letter constitutes full approval of your application (Version 1.0).

Institutional Review Board | Office of Research & Engagement
1394 White Avenue | Knoxville, TN 37996-1529
865-974-0697 | 865-974-7400 fax | irb.utk.edu

BIG ORANGE. BIG IDEAS.
Flagship Campus of the University of Tennessee System
Approval Information:
Downgrade to Exempt Category 2
100 participants
Will see consent cover statement at beginning of online survey

Approved Documents:
Application version 1.0
Linkous Dissertation Consent Form - Version 1.1
Linkous email participation request - Version 1.1
Diss Survey1 – Version 1.2

In the event that volunteers are to be recruited using solicitation materials, such as brochures, posters, web-based advertisements, etc., these materials must receive prior approval of the IRB.

Please note that restrictions are in place due to the COVID-19 pandemic, and all in-person contact with research participants is on hold until further notice.

- Newly-approved studies with in-person interactions may not begin enrollment until further notice from the IRB-HRPP.
- Newly-approved studies with no in-person participant interaction may begin after receiving IRB approval.

Please monitor the COVID-19 Updates at https://www.utk.edu/coronavirus/faq/ for the latest information. Human Subjects Research updates are being filed under Information for Instructors/Research.

Any alterations (revisions) in the protocol must be promptly submitted to and approved by the UTK Institutional Review Board prior to implementation of these revisions.

You have individual responsibility for reporting to the Board in the event of unanticipated or serious adverse events and subject deaths.

Sincerely,

Colleen P. Gilrane, Ph.D.

Chair
Appendix E

Final Survey

Survey of Self-Directed Learning and Self-Regulated Learning

The Strength of Self: An Examination of Self-Directed Learning and Self-Regulated Learning Among Master's Students

This email is to invite you, as a graduate student in the University of Tennessee Knoxville’s College of Education, Health, and Human Services, College of Social Work or College of Business, to participate in a research study.

My name is Holley Linkous, and I am a PhD candidate in Educational Psychology & Research at UTK. I am conducting my dissertation research on masters students within the College of Education, Health, and Human Services, College of Social Work, and the College of Business.

The purpose of this study is to examine the relationship between self-directed learning and self-regulated learning among adult learners in their masters education. An analysis of this relationship will contribute to the body of knowledge that bridges the gap between self-directed and self-regulated learning, as well as build on information pertaining to masters student self-guided learning techniques. Your anonymous participation in this research study includes taking an online survey about your self-regulation and self-direction in learning and demographic items of age and gender.

INFORMATION ABOUT PARTICIPANTS’ INVOLVEMENT IN THE STUDY

If you choose to participate in this study, you will follow the Continue button at the end of this page. By clicking on that button, you will be consenting to participate in this study. However, at any time while taking the survey you may elect to withdraw your participation. Your participation is limited to completing this survey one time. Once you enter the study, it will take less than 15 minutes to complete. Also, you can complete the survey on your laptop or a mobile device.

RISKS

For this study there are no foreseeable risks other than those encountered in daily life.
BENEFITS
While there are minimal direct benefits to you for participating in the study, gathered information will contribute to the understanding of learning and motivation in adult learning in masters education.

CONFIDENTIALITY
The anonymous data collected from this study will be kept confidential. The data will be stored securely on the researcher’s password-protected laptop. Data will only be made available to me as the researcher, and my major advisor, unless participants specifically give permission in writing to do otherwise. No reference will be made in oral or written reports that could link participants to this study.

CONTACT INFORMATION
If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study,) you may contact the researcher, Holley Linkous, at hsharp1@vols.utk.edu, and 865-469-7677 or my advisor, Dr. Ralph Brockett at brockett@utk.edu. If you have questions about your rights as a participant, you may contact the University of Tennessee IRB Compliance Officer at utkreb@utk.edu or (865) 974-7697.

PARTICIPATION
Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be removed and will not be used in data analyses. Once the survey has been submitted, I will not be able to remove your responses because I will not know which data came from your survey.

CONSENT
I have read the above information. I have received a copy of this form. I agree to participate in this study.
By clicking on the following button, you are consenting to participate in this research study:

- Are you currently a master’s student?
  - Yes
  - No
A Learning Experience Scale (PRO-SDLS). Please check one answer for each statement. There are no “right” answers to these statements, which pertain to your recent learning experiences in college.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am confident in my ability to consistently motivate myself.</td>
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<tr>
<td>2. I frequently do extra work in a course just because I am interested.</td>
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<tr>
<td>3. I don’t see any connection between the work I do for my courses and my personal goals and interests.</td>
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<td>4. If I am not doing as well as I would like in a course, I always independently make the changes necessary for improvement.</td>
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<td>5. I always effectively take responsibility for my own learning.</td>
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<tr>
<td>6. I often have a problem motivating myself to learn.</td>
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<tr>
<td>7. I am very confident in my ability to independently prioritize my learning goals.</td>
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<tr>
<td>8. I complete most of my college activities because I WANT to, not because I HAVE to.</td>
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<tr>
<td>9. I would rather take the initiative to learn new things in a course rather than wait for the instructor to foster new learning.</td>
<td></td>
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<td>10. I often use materials I’ve found on my own to help me in a course.</td>
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<tr>
<td>11. For most of my classes, I really don’t know why I complete the work I do.</td>
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<tr>
<td>12. I am very convinced I have the ability to take personal control of my learning.</td>
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<tr>
<td>13. I usually struggle in classes if the professor allows me to set my own timetable for work completion.</td>
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<tr>
<td>14. Most of the work I do in my courses is personally enjoyable or seems relevant to my reasons for attending college.</td>
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<tr>
<td>15. Even after a course is over, I continue to spend time learning about the topic.</td>
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<tr>
<td>16. The primary reason I complete course requirements is to obtain the grade that is expected of me.</td>
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<td>17. I often collect additional information about interesting topics even after the course has ended.</td>
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<tr>
<td>18. The main reason I do the course activities is to avoid feeling guilty or getting a bad grade.</td>
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<tr>
<td>19. I am very successful at prioritizing my learning goals.</td>
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<tr>
<td>20. Most of the activities I complete for my college classes are NOT really personally useful or interesting.</td>
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<tr>
<td>21. I am really uncertain about my capacity to take primary responsibility for my learning.</td>
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<tr>
<td>22. I am unsure about my ability to independently find needed outside materials for my courses.</td>
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<td>23. I always effectively organize my study time.</td>
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<tr>
<td>24. I don’t have much confidence in my ability to independently carry out my student plans.</td>
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<tr>
<td>25. I always rely on the instructor to tell me what I need to do in the course to succeed.</td>
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**Motivation** The following questions ask about your motivation for and attitudes about class. Please think about any recent class in your master’s program. Remember there are no right or wrong answers, just answer as accurately as possible. Use the scale below to answer the questions. If you think the statement is very true of you, select 7; if a statement is not at all true of you, select 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

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</thead>
<tbody>
<tr>
<td>1. In a class like this, I prefer course material that really challenges me so I can learn new things.</td>
<td>〇</td>
<td>〇</td>
<td>〇</td>
<td>〇</td>
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<td>〇</td>
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<tr>
<td>2. If I study in appropriate ways, then I will be able to learn the material in this course.</td>
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<td>〇</td>
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<td>〇</td>
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<tr>
<td>3. When I take a test I think about how poorly I am doing compared with other students.</td>
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<td>〇</td>
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<td>〇</td>
<td>〇</td>
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<tr>
<td>4. I think I will be able to use what I learn in this course in other courses.</td>
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<td>〇</td>
<td>〇</td>
<td>〇</td>
<td>〇</td>
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<tr>
<td>5. I believe I will receive an excellent grade in this class.</td>
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<td>〇</td>
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<tr>
<td>6. I’m certain I can understand the most difficult material presented in the readings for this course.</td>
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<td>〇</td>
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<tr>
<td>7. Getting a good grade in this class is the most satisfying thing for me right now.</td>
<td>〇</td>
<td>〇</td>
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<td>〇</td>
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<tr>
<td>8. When I take a test I think about items on other parts of the test I can’t answer.</td>
<td>〇</td>
<td>〇</td>
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<tr>
<td>9. It is my own fault if I don’t learn the material in this course.</td>
<td>〇</td>
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<td>〇</td>
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<tr>
<td>10. It is important for me to learn the course material in this class.</td>
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<tr>
<td>11. The most important</td>
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<td>thing for me right now</td>
<td>improving my overall</td>
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<td>is improving my overall</td>
<td>grade point average,</td>
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<td>grade point average, so</td>
<td>my main concern in this</td>
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<td>my main concern in this</td>
<td>class is getting a good</td>
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<td>class is getting a good</td>
<td>grade.</td>
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<td>12. I'm confident I can</td>
<td>learn the basic concepts</td>
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<td>learn the basic concepts</td>
<td>taught in this course.</td>
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<td>taught in this course.</td>
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<tr>
<td>13. If I can, I want to</td>
<td>get better grades in this</td>
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<td>get better grades in this</td>
<td>class than most of the other</td>
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<td>class than most of the other</td>
<td>students.</td>
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<td>students.</td>
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<td>14. When I take tests I</td>
<td>think of the consequences</td>
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<td>think of the consequences</td>
<td>of failing.</td>
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<td>of failing.</td>
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<td>15. I'm confident I can</td>
<td>understand the most</td>
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<td>understand the most</td>
<td>complex material</td>
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<td>complex material</td>
<td>presented by the instructor</td>
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<td>presented by the instructor</td>
<td>in this course.</td>
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<td>16. In a class like this,</td>
<td>I prefer course material</td>
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<tr>
<td>I prefer course material</td>
<td>that arouses my curiosity, even if it is difficult to learn.</td>
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<tr>
<td>17. I am very interested</td>
<td>in the content area of this course.</td>
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<tr>
<td>18. If I try hard enough,</td>
<td>then I will understand the course material.</td>
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<td>19. I have an uneasy,</td>
<td>upset feeling when I take an exam.</td>
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<tr>
<td>20. I'm confident I can</td>
<td>do an excellent job on the assignments and tests in this course.</td>
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</tr>
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<tr>
<td>21. I expect to do well in this class.</td>
<td>☐</td>
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<tr>
<td>22. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.</td>
<td>☐</td>
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<td>23. I think the course material in this class is useful for me to learn.</td>
<td>☐</td>
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<tr>
<td>24. When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.</td>
<td>☐</td>
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<td>25. If I don't understand the course material, it is because I didn't try hard enough.</td>
<td>☐</td>
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<td>26. I like the subject matter of this course.</td>
<td>☐</td>
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<td>27. Understanding the subject matter of this course is very important to me.</td>
<td>☐</td>
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<td>28. I feel my heart beating fast when I take an exam.</td>
<td>☐</td>
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<td>29. I'm certain I can master the skills being taught in this class.</td>
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<td>30. I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.</td>
<td>☐</td>
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Learning Strategies The following questions ask about your learning strategies and study skills for class. Please think about any recent class in your master’s program. Again, there are no right or wrong answers. Answer the questions about how you study in this class as accurately as possible. Use the same scale to answer the remaining questions. If you think the statement is very true of you, select 7; if a statement is not at all true of you, select 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

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</thead>
<tbody>
<tr>
<td>31. Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.</td>
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<td>32. When I study the readings for this course, I outline the material to help me organize my thoughts.</td>
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<td>33. During class time I often miss important points because I'm thinking of other things.</td>
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<td>34. When studying for this course, I often try to explain the material to a classmate or friend.</td>
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<td>35. I usually study in a place where I can concentrate on my course work.</td>
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<td>36. When reading for this course, I make up questions to help focus my reading.</td>
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<td>37. I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.</td>
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<td>38. I often find myself questioning things I hear or read in this course to decide if I find them convincing.</td>
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<td>39. When I study for this class, I practice saying the material to myself over and over.</td>
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<td>40. Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone.</td>
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Learning Strategies The following questions ask about your learning strategies and study skills for class. Please think about any recent class in your master's program. Again, there are no right or wrong answers. Answer the questions about how you study in this class as accurately as possible. Use the same scale to answer the remaining questions. If you think the statement is very true of you, select 7; if a statement is not at all true of you, select 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

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41. When I become confused about something I'm reading for this class, I go back and try to figure it out.

42. When I study for this course, I go through the readings and my class notes and try to find the most important ideas.

43. I make good use of my study time for this course.

44. If course readings are difficult to understand, I change the way I read the material.

45. I try to work with other students from this class to complete the course assignments.

46. When studying for this course, I read my class notes and the course readings over and over again.

47. When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.

48. I work hard to do well in this class even if I don't like what we are doing.

49. I make simple charts, diagrams, or tables to help me organize course material.

50. When studying for this course, I often set aside time to discuss course material with a group of students from the class:
**Learning Strategies** The following questions ask about your learning strategies and study skills for class. Please think about any recent class in your master’s program. Again, there are no right or wrong answers. Answer the questions about how you study in this class as accurately as possible. Use the same scale to answer the remaining questions. If you think the statement is very true of you, select 7; if a statement is not at all true of you, select 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

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</table>

51. I treat the course material as a starting point and try to develop my own ideas about it.

52. I find it hard to stick to a study schedule.

53. When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions.

54. Before I study new course material thoroughly, I often skim it to see how it is organized.

55. I ask myself questions to make sure I understand the material I have been studying in this class.

56. I try to change the way I study in order to fit the course requirements and the instructor’s teaching style.

57. I often find that I have been reading for this class but don’t know what it was all about.

58. I ask the instructor to clarify concepts I don’t understand well.

59. I memorize key words to remind me of important concepts in this class.

60. When course work is difficult, I either give up or only study the easy parts.
Learning Strategies The following questions ask about your learning strategies and study skills for class. Please think about any recent class in your master’s program. Again, there are no right or wrong answers. Answer the questions about how you study in this class as accurately as possible. Use the same scale to answer the remaining questions. If you think the statement is very true of you, select 7; if a statement is not at all true of you, select 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

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<th>Very true of me</th>
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<tr>
<td>61. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course.</td>
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<td>62. I try to relate ideas in this subject to those in other courses whenever possible.</td>
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<td>63. When I study for this course, I go over my class notes and make an outline of important concepts.</td>
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<td>64. When reading for this class, I try to relate the material to what I already know.</td>
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<td>65. I have a regular place set aside for studying.</td>
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<td>66. I try to play around with ideas of my own related to what I am learning in this course.</td>
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<td>67. When I study for this course, I write brief summaries of the main ideas from the readings and my class notes.</td>
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<td>68. When I can’t understand the material in this course, I ask another student in this class for help.</td>
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<td>69. I try to understand the material in this class by making connections between the readings and the concepts from the lectures.</td>
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<td>70. I make sure that I keep up with the weekly readings and assignments for this course.</td>
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<td>71. Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.</td>
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<td>72. I make lists of important items for this course and memorize the lists.</td>
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<td>73. I attend this class regularly.</td>
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<td>74. Even when course materials are dull and uninteresting, I manage to keep working until I finish.</td>
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<td>75. I try to identify students in this class whom I can ask for help if necessary.</td>
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<td>76. When studying for this course I try to determine which concepts I don't understand well.</td>
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<td>77. I often find that I don't spend very much time on this course because of other activities.</td>
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<td>78. When I study for this class, I set goals for myself in order to direct my activities in each study period.</td>
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<td>79. If I get confused taking notes in class, I make sure I sort it out afterwards.</td>
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<td>80. I rarely find time to review my notes or readings before an exam.</td>
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<td>81. I try to apply ideas from course readings in other class activities such as lecture and discussion.</td>
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**What is your gender?**

- Male
- Female
- Please specify:

**What is your age?**
## Appendix F

### Factor Correlations between PRO-SDLS and MSLQ

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<th>MSLQ</th>
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Factor Correlations between PRO-SDLS and MSLQ continued

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Vita

Holley Linkous is a first-generation college student from East Tennessee. While attending a local community college, she found her passion in public speaking and training. Holley graduated in 2007 from East Tennessee State University with her Bachelor of Science in Communication with an emphasis on Speech and a minor in Leadership Studies. After working in higher education and the private business sector, she decided to return for her Master of Business Administration degree. Holley graduated from the Professional MBA program at the University of Tennessee in 2013.

In January of 2017, Holley began her doctoral journey in the Adult Learning program at the University of Tennessee. Since that time, she and her husband Chris welcomed two daughters, Clara and Charley.