Getting Gritty with It: An Examination of Self-Directed Learning and Grit Among Doctoral Students

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Dedication

For Dad. I never imagined I would have to finish this journey without you. Every day, I miss you. Every day, I wish I could tell you, just one more time, that you were always such a *good* dad. How I loved you then, and love you even more today. May your memory always be a blessing.

And gratitude for the birds, squirrels, and chipmunks who came to my window ledge. In the midst of all the ugliness and hurt in the world, watching the little animals reminds me that as they do what G-d has designed for them to do, so too must I. Doing justice, loving kindness, and walking humbly with Him.

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In May 2010 I returned to college to finish an undergraduate degree that I had abandoned 20 years earlier. The past eight years and three degrees have taken some grit and some self-direction, but nothing could have gotten me to the finish line without other people.

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Abstract

Extant literature suggests studying for a doctorate requires not just the growth of intellectual and technical skills and abilities, but also progressively developing more noncognitive attributes. Two noncognitive factors with demonstrated relationships with academic outcomes include self-directed learning and grit. Self-directed learning (SDL) is defined as the process of initiating, maintaining, and evaluating one's own learning, as well as the individual characteristics – such as control, initiative, self-efficacy, and motivation – of the learner who engages in self-directed learning (Brockett & Hiemstra, 1991; Stockdale, 2003). Grit, identified as a noncognitive trait by Duckworth, Peterson, Matthews, and Kelly (2007), is defined as "perseverance and passion for long-term goals" (p. 1087). While various studies have examined these factors separately, none has explored the relationship between SDL and grit among doctoral students.

The purpose of this study was to examine the relationships among SDL, grit, and progression toward degree among doctoral students. Participants (N = 118) were doctoral students in a college of education, health, and human sciences at a large, R1 public institution in the southeastern United States. Participants completed the PRO-SDLS (Stockdale, 2003), measuring SDL, and the Grit-S (Duckworth & Quinn, 2009), measuring grit, as well as age, gender, employment status, enrollment status, and stage in degree. Correlational tests and independent samples t-tests were conducted to identify significant relationships and differences, respectively, among these variables.

A very strong, significant positive relationship was found between SDL and grit (r = .70, p<.001). Significant positive relationships also were found among the PRO-SDLS four factors (initiative, control, self-efficacy, and motivation) and the Grit-S two factors (consistency of interest and perseverance of effort). SDL and age were found to be significantly positively

related (r = .23, p = .013), suggesting older participants were more self-directed. Grit was found to be significantly different by gender $t(116) = 2.33$, p = .021, as women participants were significantly grittier than men participants.

Implications for practice include introducing SDL and grit as noncognitive learner characteristics to doctoral students, as well as designing doctoral education to foster self-direction and grittiness. Recommendations for future directions for research are also addressed.

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Chapter One

Introduction to Study

The path to a doctorate is a years-long, rigorous endeavor filled with intellectual challenges. Doctoral students, through demonstrated proficiency in entrance exams like the GRE, are presumed to be capable in meeting these challenges. Yet the challenges extend beyond intellectual, and even technical, abilities and skills, turning the path to the doctorate into an unmarked journey through a wilderness. Indeed, this path requires a breadth of skills and abilities to transform a doctoral student into a scholar (Elkhana, 2006; Lovitts, 2001, 2005, 2007; Lovitts & Nelson, 2000; Walker, Golde, Jones, Bueschel, & Hutchings, 2008). This may explain why, while more and more would-be scholars head down their respective paths (Okahana, Feaster, & Allum, 2016), only about one-half will reach their destinations (Bair & Haworth, 1999; Council of Graduate Schools [CGS], 2004, 2010; Lovitts, 2001; Lovitts & Nelson, 2000; Nettles & Millet, 2006).

Doctoral students are admitted to PhD programs after meeting programmatic and institutional requirements designed to select students capable of completing the years-long, intellectually-intensive process (Okahana et al., 2016). As Lovitts (2001, 2005) has argued, doctoral students enter PhD programs because they have had previous academic success as students wherein that success, generally, involved being consumers of knowledge, rather than generators of it. Becoming a generator of new knowledge is the "critical transition" in doctoral education (Lovitts, 2005, p. 138).

Walker, Golde, Jones, Bueschel, and Hutchings (2008) have stated that the "formation" of a doctoral student into a scholar requires developing the requisite intellectual and technical skills and abilities of a given discipline, certainly, but that the formation extends beyond those

domains of intellectual and technical expertise. Walker et al. argued that doctoral education must include actively developing the "skills, habits, and dispositions that fully prepare scholars to contribute to their disciplines" (p. 62). This development happens progressively through practice – the "guided, repeated, intention, self-conscious effort" (p. 62). Elkhana (2006) made a similar sentiment, writing that doctoral education "must emphasize the personality, character, habits of heart and mind, and general scholarly dispositions of the steward of the discipline" (p. 66). The goal of this progressive development, and emerging *way of being*, is to move a doctoral student from dependent learner to independent scholar (Walker et al., 2008).

The doctoral education phenomenon has been studied from various angles. Some scholars have explored the transition from a doctoral student's role as a course-taker to the role of burgeoning independent scholar, as noted above, (Lovitts, 2005, p. 138), while others have addressed the hidden curriculum of navigating the unknowns of doctoral education (Lovitts, 2001; Walker et al., 2008). Other scholars have studied the factors related to completing a dissertation – the last hurdle to graduation (Lovitts, 2005). Numerous studies have investigated the factors related to all-but-dissertation (ABD) status, for example financial support (Bair & Haworth, 1999; van der Haerta, Ortiz, Emplit, Halloin, & Dehon, 2014), support of colleagues and faculty (Kelley & Salisbury-Glennon, 2016; Spaulding & Rockinson-Szapkiw, 2012), and the writing process (Lindsay, 2015).

Other scholars have studied the facilitating and impeding factors in doctoral student success. Noncognitive factors have been among those variables studied. For example, scholars have studied factors that include relationship with advisors (Baird, 1995; Golde & Dore, 2001; Lovitts, 2001), student motivation (Cardona, 2013; Mason, 2012), student self-regulation (Kelley, & Salisbury-Glennon, 2016), positive self-concept (Sedlacek, 2001), departmental and

faculty factors, as well as best practices for faculty and institutions (Di Pierro, 2007; Ferrer de Valero, 2001; Gardner, 2009), and positive psychology constructs, like persistence (Ivankova & Stick, 2007) and grit (Cross, 2013).

Noncognitive factors have been defined in numerous ways (Fonteyne, Duyck, & De Fruyt, 2017). Allen, Robbins, and Sawyer (2009) used the term noncognitive to describe "nontraditional predictors that represent behavioral, attitudinal, and personality constructs" (p. 2). Included under the "umbrella" of noncognitive factors are psychosocial and personality constructs, as well as motivation, self-concept, and situational judgment (p. 2). Lipnevich and Roberts (2012) sorted the abundance of noncognitive factors into a taxonomy with four categories: attitudes and beliefs, social and emotional qualities, learning processes, and personality traits (p. 174). Sedlacek, in examining noncognitive factors related to nontraditional students in higher education success, defined these factors as those that are related to "adjustment, motivation, and student perceptions" (p. 845).

While entrance criteria, like entrance exams, function as proxy indicators and predictors of intelligence, cognitive abilities, and future academic success, research indicates that cognitive capabilities are not consistently more predictive of academic success than are noncognitive factors (Duckworth, Peterson, Matthews, & Kelly, 2007; Duckworth & Quinn, 2009; Robertson-Kraft & Duckworth, 2014; Strayhorn, 2014). In short, although noncognitive factors are not used as predictors of academic success in entrance exams, noncognitive factors affect academic success.

Statement of the Problem

As scholars continue building greater understanding of what factors influence and predict doctoral student success and attrition, one facet of this doctoral education path is known:

Attrition of doctoral students comes at a cost to students, faculty, departments, institutions, and society at-large. As such, this area of inquiry carries weight and significance given the investments and costs associated with the road to the doctorate. For students, the investment is substantial – time away from family and full-time employment, money for tuition and fees and, for many, emotional well-being (Austin, 2009; Hyun, Quinn, Madon, & Lustig, 2006; Lovitts, 2001; Walker et al., 2008). For faculty, departments, and institutions, the investments are equally substantial with the investment of time on the part of the faculty to mentor doctoral students and the financial investment to support students (Lovitts, 2001; Walker et al., 2008). Finally, for society at-large there is a loss, too, as terminally-degreed individuals are needed in the academy as well as in other public and private sectors to create and advance knowledge, inform public policies, and to bring a diversity of perspectives to "social and scientific issues" (Lovitts, 2001, pp. 4-5).

It is within this framework that I situate this study. Because of the investments made into doctoral education by all parties, it is incumbent upon scholars to continue building an understanding about the phenomenon of doctoral education, and, in particular to this study, building an understanding of doctoral student noncognitive characteristics and progression to degree. Building on the work of Cross (2013), who examined the concept of grit among doctoral students, I proposed examining the noncognitive constructs of self-directed learning (SDL) and grit to further the description and insight into doctoral students who progress through their programs. My rationale is that extant literature (for example Elkhana, 2006; Lovitts, 2001, 2005; Walker et al., 2008) suggests that studying for a doctorate requires not just the growth of intellectual and technical skills and abilities, but also requires developing progressively more noncognitive attributes of independence, self-direction, and perseverance in navigating the path

to the degree. As such, these factors of SDL and grit offer lenses through which to view these doctoral student attributes.

The literature on grit and academic factors such as class attendance, grades, GPA, retention, meta-cognition, and adjustment, has focused primarily on the undergraduate population (for example Arouty, 2015; Bowman, Hill, Denson, & Bronkema, 2015; Macdonald, 2016; Shishim, 2012; Strayhorn, 2014). As such, there is limited literature that has examined grit and academic factors within the doctoral student population.

While robust literature has examined the doctoral student attrition and graduation phenomenon, very little research that I have found has examined this through the lenses of SDL and grit, although these factors have been suggested by other scholars (Cross, 2013; Spaulding & Rockinson-Szapkiw, 2012) and the factors – SDL and grit – may appear self-evident to some as relevant to reaching the end of the long and winding path to the doctorate.

Purpose of the Study

The purpose of this study was to examine the relationships among self-directed learning, grit, and progression toward degree among doctoral students. Through examining these relationships, the goal of this study was to build upon the understanding of the relationship between SDL and grit, as well as continue exploring doctoral student characteristics in the progression toward degree completion.

For this study, I define SDL as both the process in which individuals engage when they initiate, implement, and evaluate their own learning, as well as the learner characteristics of individuals who engage in SDL, such as their motivation and self-efficacy (Brockett & Hiemstra, 1991; Stockdale, 2003; Stockdale & Brockett, 2011). This definition represents the conceptual model of Brockett and Hiemstra's PRO model, as discussed below and in Chapter Two.

I define grit, as Duckworth, Peterson, Matthews, and Kelly (2007) have, as "perseverance and passion to pursue long-term goals" (p. 1087). Additionally, I will examine doctoral students' progression toward graduation, modeled on Cross' (2013) study, wherein the doctoral progression is segmented into stages that reflect milestones of doctoral study.

Research Questions

This study will address the following questions:

1. What is the relationship between self-directed learning and grit among doctoral students?
2. What is the relationship between self-directed learning and age, self-directed learning and gender, and self-directed learning and stage in program?
3. What is the relationship between grit and age, grit and gender, and grit and stage in program?

Theoretical Frameworks for the Study

This study's design was informed by research in two areas of empirical inquiry: self-directed learning (SDL) – a construct from the field of adult education – and grit – a construct from the field of positive psychology. Below, I provide an overview of the SDL framework and construct, as well as the model on which it is measured. Next, I provide an overview of the grit framework and construct.

Self-Directed Learning Framework and Model

SDL, as a field of inquiry within adult education, has been described as a process (Grow, 1991; Knowles, 1975), as characteristics of the individual (Brockett & Hiemstra, 1991; Garrison, 1997; Hiemstra & Brockett, 2012), as personality traits (Kirwan, Lounsbury, & Gibson, 2010), and as "a way of life for most adults" (Brockett & Hiemstra, 1991, p. 2). Within adult education

in the past nearly 50 years, SDL has been a rich area of scholarship (Merriam, Caffarella, & Baumgartner, 2007), producing mostly descriptive research early on and then moving toward quantitative inquiry later (Brockett, 1985; Merriam et al., 2007).

Brockett and Hiemstra (1991) originally developed the Personal Responsibility Orientation (PRO) model to illustrate the interaction of the individual within the process of learning (characteristics of teaching-learning transaction) and an individual's orientation to engage in the learning process (characteristics of the learner), all of which occur within a given social context (p. 25) (see Figure 1). In 2012, the authors presented an updated version of their SDL model that "incorporates new understanding of SDL and reconfigures relationships among the original model's key elements" (Hiemstra & Brockett, 2012, p. 155). The updated model is entitled Person Process Context (PPC), which, as a Venn diagram, illustrates the dynamic convergence of the three elements through which SDL emerges. However, for the purpose of this study, I am using Brockett and Hiemstra's original PRO model, as it is the basis for the instrument that I will be using, the PRO-SDLS (Stockdale, 2003).

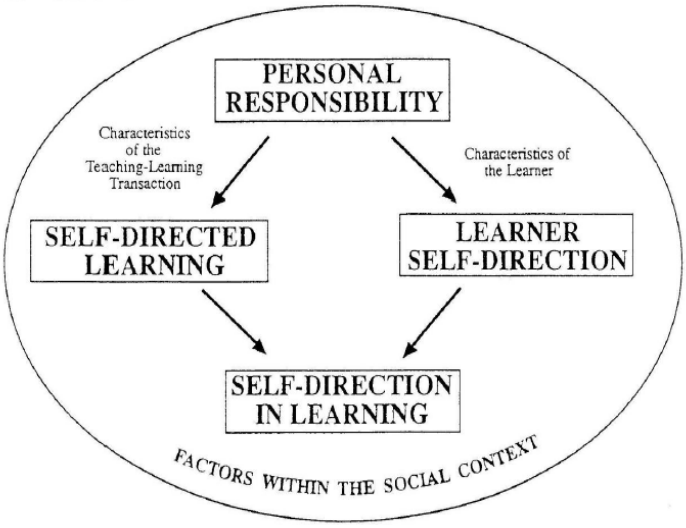

Figure 1: PRO Model (Brockett & Hiemstra, 1991). Reproduced with permission of authors.

Self-Directed Learning Factors

Stockdale (2003) developed the Personal Responsibility Orientation to Self-Direction in Learning Scale (PRO-SDLS) by operationalizing Brockett and Hiemstra's (1991) PRO model. The PRO-SDLS is designed to measure two components: teaching-learning and learner characteristics. Within the teaching-learning component are two factors, initiative and control. Within the learner characteristics component, there are two components, self-efficacy and motivation (Stockdale & Brockett, 2011). The PRO-SDLS has been used in higher education as well as in the workplace to measure the relationship of SDL with a variety of constructs. For example, Holt (2011) examined SDL and technology use in the workplace; Beard (2016) examined SDL and efficacy in incorporating technology into pedagogy for pre-service teachers; and Conner (2012) investigated SDL and information literacy among adult learners in higher education.

Stockdale (2003), using expert judgment followed by confirmatory factor analysis, identified the four factors noted above. Here is a brief description of these factors.

Initiative. Initiative lies at the heart of SDL. Initiative is the first step in an individual's engaging in SDL, following the identification of a problem or question to be answered. Brockett and Hiemstra (1991) termed this *taking personal responsibility* (Stockdale & Brockett, 2011, p. 165).

Control. According to Brockett and Hiemstra (1991), control within the context of learning is defined as "the ability and/or willingness of individuals to take control of their own learning." As such, the degree to which individuals will take control of their own learning is what "determines their potential for self-direction" (p. 26).

Self-efficacy. Self-efficacy is defined as one's perceived abilities to complete a given task (Schunk, Pintrich, & Meece, 2008). Stockdale and Brockett (2011) made the argument that self-efficacy is embedded into SDL, as individuals' willingness to engage in specific acts of SDL is a function of their self-beliefs.

Motivation. Motivation refers to the process wherein goal-directed behavior is instigated and sustained (Schunk et al., 2008). Stockdale and Brockett (2011) referenced Ryan and Deci's claims regarding the role that motivation plays in self-directed learning.

Grit Framework

As noted in the introduction, I theorize that one of the ways to understand doctoral student progression to degree is through the lens of grit. Grit is defined as perseverance and passion for long-term goals (Duckworth et al., 2007, p. 1087). Grit is a construct from the field of positive psychology, which is the science and practice of well-being (Lomas, Hefferon, & Ivtzan, 2014). Duckworth and her colleagues identified this construct through their study of achievement behaviors.

Duckworth has described "gritty" individuals as ones who are "unusually resilient and hardworking" and know "in a very, very deep way what it was they wanted," possessing determination and direction (Duckworth, 2016a, p. 8). Individuals with grit are the ones who continue pressing on toward a goal, over long periods of time, with sustained interest in the goal, and despite the absence of positive feedback (Duckworth et al., 2007).

Duckworth and her colleagues' early studies examined grit and its relationship with age, educational attainment, frequency of job changes, the Big Five personality model, and undergraduate GPA (Duckworth et al., 2007). Later studies examined the predictive nature of grit in determining which cadets would complete orientation and first-year retention at a military

academy, as well as which competitors would be finalists in a national spelling bee (Duckworth & Quinn, 2009). Collectively, the findings suggested that grit, as an individual difference, accounted for more variance in achievement outcomes than did IQ, to which grit was inversely related; grit correlated with higher GPAs for undergraduates at an elite university, despite the grittier undergraduates' having lower SAT scores; grittier individuals (those who scored higher on the grit instrument) were more likely to have stable careers; and, finally, grit better predicted retention among West Point cadets than the academy's whole-candidate score used for admission (Duckworth et al., 2007, p. 1098; Duckworth & Quinn, 2009).

Grit is understood to have two factors: consistency of interest (passion) and perseverance of effort (perseverance) (Duckworth et al., 2007; Duckworth & Quinn, 2007). Passion is defined as consistency of interest (Duckworth, 2016a). In her early work with paragons of achievement, Duckworth (2016a) found that these paragons have certain psychological assets in common (p. 89). Among these, *interest* was identified as the entrée into passion. Passion began by being intrinsically fulfilled by engaging in the activity in which the paragon had achieved. The consistency of interest is sustained by the purpose that it provides, both personally and professionally (p. 91).

Perseverance is an element of the trait-level grit that, according to Duckworth (2016a), guides individuals in devoting themselves to "focused, full-hearted, challenge-exceeding-skill practice that leads to mastery" (p. 91). Perseverance allows individuals to sacrifice immediate and intermediate interests and desires for long-term achievement.

Significance of the Study

As noted in the literature, attrition rates among doctoral students are substantial, hovering between 40 and 60 percent, depending on the discipline (Bair & Haworth, 1999; CGS, 2004,

2010; Lovitts, 2001; Lovitts & Nelson, 2000; Nettles & Millet, 2006). These attrition rates translate into real losses for students, faculty, and institutions, alike. Also addressed in the literature is the role that noncognitive factors can play in doctoral student education (Lovitts, 2001, 2005; Walker et al., 2008).

Various scholars have theorized that doctoral education requires progressively developing the noncognitive attributes of independence, self-direction, and perseverance in navigating the path to the degree (Lovitts, 2005; Walker et al, 2008). These attributes are found within SDL and grit. Furthermore, SDL and grit, in various studies that examined these constructs separately, have been shown to be related to academic outcomes. Scholars have reported grit as having a significant relationship to grades, GPA, attendance, retention, and intent to persist (Bowman et al., 2015; DeCandia, 2014; Duckworth et al., 2007; Fillmore, 2015; Muenks, Wigfield, Yang, & O'Neal, 2016; Shishim, 2012). Similarly, scholars in adult learning have reported significant relationships between SDL and academic performance (Carson, 2012; Hall, 2011). No studies to date have examined the relationship between SDL and grit.

As such, examining the underlying factors that may be related to, and facilitative in, progression toward degree may bring greater understanding to the roles of self-direction, interest, and persistence in doctoral education. Therefore, this study is significant in a number of ways. First, within doctoral education, it contributes to the understanding of the relationships among SDL, grit, and progression toward degree. Additionally, this study provides insight into the roles of age and gender in SDL and grit. In a broader scope, in examining the relationship between SDL and grit, this study expands the understanding of the interconnections between SDL and constructs of positive psychology, which have been explored by various scholars (Brockett, 1985; Dieffenderfer, 2014; Stockdale, 2003; Vess, 2015). Finally, this study provides

implications for practice for faculty in their work with doctoral students; for example, faculty may foreground the awareness and role of SDL and grit within doctoral education persistence and success.

Assumptions, Delimitations, and Limitations

Assumptions

In undertaking this study, I made certain assumptions regarding the sample's participants, the instruments, and the data analysis. First, I assumed that all participants would answer the PRO-SDLS, Grit-S, stage in program, and demographic information honestly and correctly. Second, I assumed the instruments would adequately and appropriately capture and measure the variables identified in the study. Third, I assumed the proposed quantitative analyses would be sufficient to detect relationships among these variables.

Delimitations

I delimited this study in three ways. First, I only solicited doctoral students from one college of education, health, and human sciences within one large R1 public institution in the southeastern United States. Second, as other scholars (see Boatmun, 2016) have sought to understand grit qualitatively, I appreciate that other methodologies can serve to provide a fuller picture of phenomena; however, for this exploratory study, I delimited my methodological approach to quantitative methods as this study was to explore relationships between SDL and grit. Third, I examined grit and SDL among doctoral students at a given time in their academic programs. Therefore, with this study, I took "snap shot" of SDL and grit, as opposed to a longitudinal study that would have examined SDL and grit over time.

Limitations

While this study builds on extant empirical research with repeatedly-validated instruments, there were inherent limitations. The following were limitations that may affect the generalizability of the findings.

Study sample. This study used a volunteer sample, which introduces the possibility of sample bias. This type of bias occurs, as the name implies, because of who, within the population, volunteers for the study (Agresti & Finlay, 2009). This is juxtaposed against probability sampling of random assignment wherein everyone within a given population has an equal chance of being selected for the study's sample (McBride, 2016).

For this study, the population was doctoral students. This population has a broad diversity of individuals; the diversities can range in familial status, employment status, credit-hour enrollment, all of which can affect who chooses to participate in the study. An individual's load (full-time employment, children, full- or part-time academic load) may have affected which doctoral students chose to participate in this study. Thus, lacking diversity in the sample could affect the generalizability of the study's findings.

Self-reporting. Another limitation was the direct self-reporting aspects of the instruments. Data from self-report instruments can be influenced by a number of issues, including self-perception and self-presentation, primacy and recency effects, time pressure, and consistency of motivation (Paulhus & Vazire, 2007). A self-report option allowed for the participants taking the instruments to respond as a function of their frame of reference (to their peers) and / or as a function of social desirability (Fisher, 1993). Further, both scales are fake-able, meaning that participants could have clearly determined the intent of the questions and responded accordingly.

Definitions

In this study, I used the following terminology, which I define as:

Grit – Identified as a non-cognitive trait, grit is defined as perseverance and passion for long-term goals (Duckworth et al., 2007, p. 1087).

Self-directed learning – SDL is defined as both the process in which individuals engage when they initiate, maintain, and evaluate their own learning, as well as the learner characteristics of individuals who engage in SDL, such as their motivation and self-efficacy (Brockett & Hiemstra, 1991; Stockdale, 2003; Stockdale & Brockett, 2011).

Conclusion and Outline of the Study

The purpose of this study was to examine the relationships among self-directed learning, grit, and progression toward degree among doctoral students. Through examining these relationships, the goal of this study was to build upon the understanding of the relationship between SDL and grit, as well as continue the exploring doctoral student characteristics in the progression toward degree.

In this chapter, I presented an introduction to the study, including the statement of the problem, purpose, significance, and the research questions, as well as addressed the theoretical frameworks, assumptions, delimitations, limitations, and definitions. In Chapter Two, I review the literature related to SDL, grit, and doctoral student progression toward degree. Next, in Chapter Three, I present the research design including study population and sample, instrumentation, and data analyses. Then, in Chapter Four, I present the results of the data analysis, including a demographic profile of the sample and the inferential statistics related to the research questions. Finally, in Chapter Five, I interpret and discuss the relevant findings in

connection with extant literature, theorize implications and recommendations for practice, and, finally, address future directions for research in this area.

Chapter Two

Review of the Literature

Nearly a decade ago, Anderson and Brockett (2008) posed the question if there were "a place at the adult education table for positive psychology?" Anderson and Brockett theorized the benefits of the two fields engaging in a dialog, with developing "new and interesting insights in adult education and positive psychology" (p. 1). As such, the scholars explored the similarities, distinctions, and contradictions between the two fields.

One area in which Anderson and Brockett (2008) saw potential for the intersection of adult education and positive psychology was the application of the positive psychology body of knowledge regarding human strengths – such as self-efficacy, resilience, creativity, and hope – within adult education contexts. Educators, when interacting with their learners, could frame the teaching-learning exchange through the lens of positive psychology by identifying and developing learners' strengths and using "more positive language to explain negative feedback" (p. 5). In particular, Anderson and Brockett suggested, through the application of positive psychology, educators could foster learners' self-direction in learning, as most learning in adulthood is self-directed. In the intervening years, the question posed by Anderson and Brockett regarding a "place at the table" has served as an invitation, perhaps, as fellow adult education scholars have begun exploring how the two fields engage together at the table of research.

A growing number of studies have sought to "build a bridge" (Vess, 2015, p. 6) between self-directed learning (SDL), a subfield of adult education, and various constructs in positive psychology. Recent studies have examined the relationships between SDL and gratitude (Vess, 2015), and SDL and hope (Dieffenderfer, 2014), while earlier studies examined SDL and

resilience (Robinson, 2003), self-determination (Stockdale, 2003), and life satisfaction (Brockett, 1985).

While studies have examined empirical relationships, Teal, Vess, and Ambrose (2015) examined the conceptual interconnections of SDL and positive psychology. They developed the conceptual Model of Self-Directed Wellness to "provide insight into helping students flourish and become more self-directed" (p.16). The model, rooted in Seligman's (2011) Positive Emotion, Engagement, Positive Relationships, Meaning, and Accomplishment (PERMA) theory of well-being, connects the attributes of the PERMA elements with similar attributes identified in the SDL literature in describing SDL as a process, individual characteristics, and learning outcomes. Teal et al. theorized that SDL intersects with grit through the PERMA elements of Accomplishment and Engagement, suggesting that concepts and constructs of SDL that were reflected in Engagement included learner control, learner autonomy, self-regulation, self-management, and goal directedness. The concepts and constructs of SDL that were reflected in Achievement included self-determination, motivation, mastery of goals/skills, and self-efficacy.

The overarching goal in developing their Model of Self-Directed Wellness, according to Teal et al. (2015), was to "promote well-being, lifelong learning, and self-direction through the development of a variety of self-directed learning and positive psychology strategies" (p. 24). In promoting these types of strategies, Teal et al. also suggested a spectrum of practical applications of the interconnections, from individual learner development to curricula/programmatic design to institutional structure.

Like Anderson and Brockett (2008) earlier, Olson (2015) also theorized on the intersection of adult education and positive psychology within the workplace of adult education practice. Olson suggested that work ethic and grit are conceptually related, as both involve

perseverance and hard work in the face of challenges. Individuals with higher levels of grit persevere at challenging tasks longer than those individuals with lower levels of grit (Duckworth et al., 2007); additionally, adults who scored higher in grit also reported staying on their jobs longer (Duckworth et al., 2007). As such, Olson questioned if adult educators – in an effort to encourage students – should consider developing adult learners' gritty-ness.

From the lens of positive psychology, an intersection with the field of education began early. Following positive psychology's establishment, a movement began to examine positive psychology's character strengths within the domain of education (e.g., Duckworth & Seligman, 2004; Seligman, Ernst, Gillham, Reivich, & Linkins, 2009; White & Waters, 2015, among many more). For this intersection, scholars coined the phrase *positive education*, with varying but related definitions (White, 2016). Most research into positive education – that of examining empirically-validated constructs and interventions of positive psychology that are applied within formal educational contexts – has focused on interventions in K-12, while the research in higher education has been mostly correlational to describe populations.

Thus, given the intersection of adult education with constructs of positive psychology and positive psychology's intersection with educational interventions, I proposed continuing this thread of inquiry by examining SDL and grit within the context of doctoral students' progression toward degree. As stated in Chapter One, the purpose of this study was to examine the relationships among self-directed learning, grit, and progression toward degree among doctoral students.

Building on the work of other scholars who have questioned and examined the intersection of adult education and positive psychology, this chapter delves into the literature to build an understanding of SDL and grit as concepts and constructs, individually, and an

understanding of how they intersect. First, I examine SDL, exploring how it is defined among adult education scholars, how it is conceptualized into models, its major empirical findings for its construct, the instruments by which it is measured, and, finally, its criticisms. Next, I present literature on grit. Within this discussion, I define grit, explore its development, identify the broad categories of its findings, discuss how it is measured, and then address its criticisms. Finally, I discuss the convergence and divergence of the constructs through the philosophical connections, characteristics, and contexts.

Exploring Self-Directed Learning

Self-directed learning, as a field of inquiry within adult education, has been described as a process (Grow, 1991; Knowles, 1975), as characteristics of the individual (Brockett & Hiemstra, 1991; Garrison, 1997; Hiemstra & Brockett, 2012), as personality traits (Kirwan et al., 2010), and as "a way of life for most adults" (Brockett & Hiemstra, 1991, p. 2). Within adult education in the past 50 years, SDL has been a rich area of scholarship (Merriam et al., 2007), producing mostly descriptive research early on and then moving toward quantitative, with some qualitative, inquiry later (Brockett, 1985; Merriam et al., 2007).

Meanwhile, outside of adult education, SDL – in terms of developing it, identifying occurrences of it, and identifying impediments to it – has spread to numerous other fields, such as medical training, personal healthcare management, and human resources development (Ruttencutter, McEwan, & Shih, 2014). In this section, I explore SDL, including an overview of various definitions, as well as models, measurements, and, finally, criticisms.

Terminology

In the development of the SDL field, much discussion has centered on what it is, as well as its nomenclature. *Self-teaching* (Tough, 1971) was an early descriptor of this process in

which adults engaged. Hiemstra and Brockett (2012) discussed how their language changed from *self-direction in learning* – which focuses on the learning process – to *self-directed learning*, stating that most scholars use the latter term (p. 157). They further stated that, for them, they drew a distinction between the characteristics of the learner engaged in SDL (learner self-direction) compared to the characteristics of SDL as a teaching-learning process (self-directed learning). For the purpose of this study, I use SDL to represent both the process of self-directed learning and the characteristics of self-directed learners.

Defining Self-Directed Learning

Much discussion has occurred as scholars tried to frame SDL, identifying what it is, as well as what it is not. Brockett and Hiemstra (1991) reviewed the progress of this discussion early on, providing a synopsis that some scholars have seen it as a personality characteristic while others have seen it as an instructional method (p. 22). Later scholars (e.g., Merriam et al., 2007; Merriam & Bierema, 2014) reiterated this, stating simply that the fluidity in terminology continues. Here I explore both propositions.

Process. SDL can be understood in a few different ways. As a process, Brockett, quoted in an interview with Donaghy (2005), stated that – whatever the nomenclature – SDL is about "people taking responsibility for their own learning and playing the key role in making decisions about what they learn, when they learn, how they learn, and being in control of that" process (p. 134). Merriam and Bierema (2014) echoed this in stating SDL occurs when one intentionally seeks to learn, plans the learning, takes responsibility and controls it, and then evaluates the outcomes of the learning (p. 61). SDL, as a process, can occur in myriad contexts, from watching a YouTube video of how to trim one's bangs, to someone who takes a ukulele course at

the senior center, to a formal education program that uses learning contracts with doctoral students in identifying their learning objectives and planning their studies.

Research has shown that adults engage in learning projects (the process of SDL) consistently for both personal and professional reasons. Allen Tough (1971) reported that 90% of adults in his study ($N = 66$) engaged in learning projects. While Tough's sample size arguably lacked robustness for generalizability, Livingstone's (2002) study of 1,500 Canadian adults confirmed Tough's early findings. Livingstone reported more than 90% of adults were "involved in some form of informal learning activities that they…identify as significant" (p. 2). The participants of Livingstone's study identified the learning projects as those related to their jobs, community volunteer work, household work, and other general interests. In line with Livingstone's findings of adults engaged in work-related learning projects, and designed based on Tough's original work, Harrison (2010) and Smeltzer (2016) examined work-related learning in various contexts. Harrison, examining projects among small business owners, reported participants ($N = 35$) engaged in 6.8 projects the previous year. Smeltzer's examination of work-related learning projects focused on elected municipal officials ($N = 41$), wherein the learning projects were related to their elected positions. In her work, Smeltzer found officials engaged in an average 6.68 learning projects the previous year; of the average 6.68 projects annually, the majority, more than 32%, were self-planned.

A final example of adults engaged in learning projects is Rager's work with adults responding to personal health crises. Rager (2003, 2006) has reported on the experiences of adults who had been diagnosed with cancer and the learning they undertook in response to those diagnoses. In her 2003 study, Rager sought to understand the self-directed learning experiences of women who had been diagnosed with breast cancer within the previous three years. Rager

found that participants' (N = 13) self-directed learning experiences helped them identify resources and information to help "overcome fear associated with the diagnosis" and to build an understanding of what was happening (p. 283), as well as networking with other survivors and patients. Further, Rager found that in addition to locating resources to help make sense of their experiences, participants' engaging in SDL was "instrumental in meeting the emotional and psychological needs of the participants" (p. 291). In Rager's 2006 study, she aimed to develop an understanding of the experiences of men who were diagnosed with prostate cancer and engaged in self-directed learning. Rager found four themes among participants' (N = 12), including *Men don't talk*; *Living with the reality of my situation and my choices*; *The struggle with emotions*; and *Watchful waiting*.

Learner characteristics. Another way in which SDL can be understood is as the personal characteristics – or attributes or traits – of the learner. Scholars have distinguished the characteristics of learners engaged in SDL from the process of SDL, examining personal characteristics in terms of age, conscientiousness, life satisfaction, readiness for learning, and educational levels (Brockett & Hiemstra, 1991; Hiemstra & Brockett, 2012; Kirwan, 2012; Merriam & Bierema, 2014; Merriam et al., 2007).

Some scholars (Kirwan, 2012; Kirwan et al., 2010; Lounsbury, Levy, Park, Gibson, & Smith, 2009) have examined learner characteristics from the perspective of psychological, stable, trait-level dimension, looking for the connections between SDL and factors of the Big Five personality assessment (openness, conscientiousness, extraversion, agreeableness, neuroticism). Kirwan, Lounsbury, and Gibson (2010) reported that the Big Five traits accounted for 37% of the variance in learner self-direction. Similarly, Lounsbury, Levy, Park, Gibson, and Smith (2009) found self-direction in learning to be significantly correlated with conscientiousness (r = .33, p <

.01), one of the Big Five factors. However, Kirwan (2012) did not find conscientiousness to be predictive of SDL.

While the above scholars examined SDL as a personality trait, other scholars have suggested it is a confluence of attitudes, values, and abilities (Merriam & Bierema, 2014, p. 71). Brockett and Hiemstra (1991), in their discussion of learner characteristics, point to responsibility as the central element; that is, an individual takes primary, personal responsibility in choosing what learning is undertaken and in accepting "consequences of one's thoughts and actions as a learner" (p. 28).

Finally, an important point in any discussion of learner characteristics of SDL is the contextual relevance of the learning. For example, an individual may exhibit high self-direction for a hobby – such as learning how to kayak – but low self-direction for other topics that do not hold the same appeal for the learners. In this regard, the learner's degree of self-direction is a function of interest in the topic (Merriam & Beirema, 2014). The contextual element is what Candy (1991) explored when he posited that learners possess a higher level of SDL for areas of interest and areas of previous experience.

Models of Self-Directed Learning

Not long after adult education scholars identified SDL as an activity in which adults engaged (Knowles, 1968; Tough, 1971), scholars also began to develop conceptual models to explicate the SDL process (Knowles, 1975), learner characteristics and the process (Brockett & Hiemstra, 1991), the learner's experience of SDL (Garrison, 1997), as well as explored the instructional process (Grow, 1991). This section provides brief overviews these models.

Knowles

Replete throughout adult education and SDL literature are references to Knowles' early linear model of SDL (Brockett & Hiemstra, 1991; Merriam et al., 2007; Merriam & Bierema, 2014). Knowles' model described the process of SDL as steps: (1) climate setting, (2) diagnosing learning needs, (3) formulating learning goals, (4) identifying human material resources, (5) choosing and implementing appropriate learning strategies, and (6) evaluating learning outcomes (Merriam et al., p. 111).

Personal Responsibility Orientation / Person-Process-Context

Brockett and Hiemstra (1991) originally developed the Personal Responsibility Orientation (PRO) model to illustrate the interaction of the individual within the process of learning (characteristics of the teaching-learning transaction) and individual with his or her orientation to engage in the learning process (characteristics of the learner), all of which occur within a given social context (p. 25). In 2012, the authors presented an updated version of their SDL model that "incorporates new understanding of SDL and reconfigures relationships among the original model's key elements" (Hiemstra & Brockett, 2012, p. 155). The updated model is entitled Person Process Context (PPC), which, as a Venn diagram, illustrates the dynamic convergence of the three elements through which SDL emerges.

Staged Self-Directed Learning

Similar to Brockett and Hiemstra's (1991; Hiemstra & Brockett, 2012) PRO/PPC model's dynamic nature, Grow (1991) developed a model that reflected the dynamism of SDL. Grow presented the Staged Self-Directed Learning (SSDL) model for developing learner self-direction in stages, as part of the instructional process. Explicit in Grow's model is the assumption that not all learners possess the same interest and motivation in all situational

contexts in order to direct their own learning. As such, Grow's four-stage model illustrates how both the role of the teacher and the instructional practices applied are a function of the level of dependence of the learner. For example, Stage 1 in the SSDL depicts learners as dependent, for whom the teacher is an authority or coach and the instructional practices are those of "drilling, informational lectures, and overcoming deficiencies and resistance" (p. 129). As learners become more self-directed, reaching Stage 4 for example, the teacher adopts the role of "consultant / delegator" and the instruction process reflects that of an "internship, dissertation, individual work" (p. 129).

Dimensions of Self-Directed Learning

Garrison (1997) developed his comprehensive model of SDL to capture the management, monitoring, and motivational aspects of SDL (p. 19). As such, Garrison's model has three foci. First, leaners are motivated to enter the process of SDL. Next, learners experience dual processes of self-monitoring (taking responsibility to engage in the learning) and self-management (controlling the process of the learning). Collectively, these dimensions represent how the learner functions, controls, and reflects in, and on, the learning process. Garrison's model explicitly addresses the role of the learner's meta-cognition in the learning process, which is a departure from the other models discussed above. As Garrison stated, SDL is more than simply engaging in the tasks; SDL is about critically reflecting on the task and adjusting accordingly, as needed.

Measuring Self-Directed Learning

In the early years of SDL research, studies sought to confirm, first, that adults did in fact engage in learning projects and, then, sought to explore the number and types of learning projects adults were undertaking (Brockett, 1985; Merriam et al., 2007). As scholars explored

the learning of adults, they also began to explore the learners' characteristics, such as readiness to engage in learning. From there grew the development of scales to measure assumed facets of SDL. The scales measured readiness to engage in SDL (Guglielmino, 1977) and SDL as a personality trait (Oddi, 1986). Stockdale (2003), building on Brockett and Hiemstra's PRO model, as described above, developed a scale to measure learner characteristics and the teaching-learning transaction (Stockdale & Brockett, 2011). Other scales related to SDL within a given context also have been developed, such as those that examined SDL in the workplace (see De Bruin & De Bruin, 2011; Hogg, 2008) and SDL in nursing education (see Fisher, King, & Tague's [2001] adaption of Guglielmino's scale for nursing education, called the SDLRS-NE). For the purpose of this review, I am examining only three scales: Guglielmino's (1977) SDLRS, Oddi's (1986) OCLI, and Stockdale's (2003) PRO-SDLS.

Self-Directed Learning Readiness Scale

Guglielmino (1977) developed the first instrument to measure learner aspects involved in SDL, and it remains one of the most widely used instruments in measuring SDL (Merriam, et al., 2007). The SDLRS measures the internal state of *readiness* to engage in SDL, which Guglielmino defined as initiative, independence, and persistence in learning (Merriam et al., 2007, p. 121). The SDLRS has been used with various populations, such as older adults (Brockett, 1985; Hulsman, 2011), school teachers (Kirk, 2012; Wagner, 2011), and community college students (Cox, 2002). Additionally, the SDLRS has been used to explore relationships with various other constructs like life satisfaction, health promotion, creativity, use of technology, and more (Brockett, 1985; Canipe, 2001; Cox, 2002; Hulsman, 2011; Kirk, 2012). Lastly, the SDLRS also has been adapted for other contexts, such as nursing (Fisher et al., 2001).

Holt (2011), in a review of 20 studies that used the SDLRS, reported mixed results regarding SDL correlations with age, gender, GPA, and college major (p. 25). However, there were indications that SDL is significantly positively related to educational level and that SDL improves over time (p. 25).

The SDLRS has not been without questions, and at times criticism, regarding its soundness. Field (1989) strongly questioned a number of aspects of the instrument, including Guglielmino's use of the Delphi technique to identify characteristics of self-directed learners, defining the terminology of "self-directed learners," the instrument's factor structure, as well as the validity and reliability (Field, 1989, pp. 130-135; Guglielmino, 1989, pp. 235-239). Guglielmino (1989) responded to Field's questions, addressing each of his propositions. Additionally, Long (1989) and McCune (1989) also addressed Field's presumptions, suggesting that Field may not have been as well versed in the SDL literature as required and that perhaps he lacked the methodological and statistical wherewithal to have made meaningful insights into the structure, validity, and reliability of the SDLRS.

Oddi Continuing Learning Inventory

Another widely used instrument comes from Oddi (1986) who developed the Oddi Continuing Learning Inventory (OCLI) to measure self-directedness as a personality trait (Merriam et al., 2007; Oddi, 1986). This scale has shown SDL to be significantly positively correlated with a number of other constructs such as "self-efficacy, self-concept, personal responsibility," and more (Merriam et al., 2007). Further, the scale has been shown to be applicable across populations; however, there were some reported issues regarding its underlying structure and its predictive capability of student self-directed behavior in the classroom (Six,

1989; Six & Hiemstra, 1987). Similar to the SDLRS, the OCLI has been used in continuing education for the nursing field (Merriam et al., 2007).

Personal Responsibility Orientation to Self-Direction in Learning Scale

Stockdale (2003) developed the Personal Responsibility Orientation to Self-Direction in Learning Scale (PRO-SDLS) by operationalizing Brockett and Hiemstra's (1991) PRO model. The PRO-SDLS is designed to measure four factors within two components: within the teaching-learning component, the two factors are control and initiative; and within the learner characteristics component, the two factors are self-efficacy and motivation (Stockdale & Brockett, 2011). The PRO-SDLS has been used in higher education and the workplace to measure the relationships of SDL with a variety of constructs. For example, Holt (2011) examined SDL and technology use in university graduates entering the workplace; Beard (2016) examined SDL and efficacy in incorporating technology into pedagogy for pre-service teachers; and Conner (2012) investigated SDL and information literacy among adult learners in higher education.

Validated among college undergraduates and graduate students (Beard, 2016; Conner, 2012; Hall, 2011; Stockdale, 2003; Stockdale & Brockett, 2011), the instrument has indicated significant relationships between SDL and age, as well as GPA (Stockdale & Brockett, 2011). However, other studies have failed to find significant relationships among these same variables (Conner, 2012).

Criticisms of Self-Directed Learning

In the 50 years that SDL has been an active, eponymous area of empirical inquiry within the field of adult education, scholars have critically reflected and questioned the assumptions and implications implicit to this subfield. The chief criticisms identified by scholars include its

distinctly Western orientation toward, and focus on, the individual who is of a given socio-economic class (Brookfield, 1984, 1985, 1993); the focus on the individual to the near exclusion of the social inputs and societal structures (Brookfield, 1993; Garrison, 1997); and, finally, the general myths about what is, and what is not, SDL (Brockett & Hiemstra, 1991). For the purpose of this review, I have sorted the criticisms by learner context and social context.

Learner Context

In the discussion of learner context, there are a few different ways in which to understand this. The most noted is reflected in Brockett & Hiemstra's (1991) PRO model discussed above. SDL can be understood as the characteristics of an individual engaged in learning; that is, the individual's agency in initiating and directing the learning. This agency includes initiating the learning to address a particular area of inquiry or interest, identifying resources to answer the inquiry or fulfill the interest, and then evaluating the learning outcomes of that process (Brockett & Hiemstra).

One of the criticisms of this way in which SDL can be understood came from Brookfield (1984, 1985). Brookfield argued that SDL was the purview of the white, middle-class man, and that SDL was a function of having the privilege (of time and money) to engage in those learning activities, more than a function of an individual's agency. Further, Brookfield argued, not all individuals possess a readiness for SDL, which can be a function of the culture in which one is raised. In response to these criticisms, Brockett and Hiemstra (1991) and others (see Caffarella & O'Donnell, 1987) rebutted by referencing studies that highlighted SDL within non-majority populations. More recently, Andruske (2009) identified SDL among women who were transitioning from welfare in their use of learning projects to aid in that transition.

A second way of understanding learner context is whether the learner operates "in a vacuum" (Brockett & Hiemstra, 1991, p. 11), or if the learner operates, and the learning occurs, within a given context. This has been raised as a criticism, or perhaps a myth as Brockett and Hiemstra called it, or simply a misinterpretation of what SDL entails. In response, Brockett and Hiemstra stated unequivocally that SDL does not occur in a vacuum. While the individual's agency is internal to the learner, the act of engaging in learning can occur alone or among others. Later, Donaghy (2005), in reporting the findings of his dissertation study of the eight most-cited SDL scholars, indicated that scholars readily acknowledge the social element of SDL, particularly the role of collaboration in learning (p. 10). Peters and Gray (2005) echoed this sentiment with their summary description of SDL as "the solitary act one cannot do alone" (p.12).

Peters and Gray (2005) were referencing the role of a collaborative *other* in learning, even when that learning is initiated, guided, and evaluated by the individual. However, other scholars have argued that SDL's discussion of learner context and learner characteristics omitted the essential focus of the learner's context within a broader landscape (Brookfield, 1984, 1985). That broader landscape is the socio-political context in which SDL occurs. Here is where Brookfield has argued that SDL, as a field, missed the mark; although Brockett and Hiemstra (1991) stated that, certainly, learning does not occur in a vacuum as an individual learner may engage with others, Brookfield stated that context must include the environment in which that individual learner exists, as that larger environment affects whether, and how, an individual engages in SDL. I extend this discussion in the next section.

Social Context

Early in the field's development, scholars (Brookfield, 1984, 1985; Flannery, 1993) questioned what appeared to them as an absence of consideration for social context of learning. Other SDL scholars, particularly the most prolific scholars within SDL, acknowledged the central role social context plays, as if the context in which learning happens is so ubiquitous as to render it unseen, but not un-experienced (Brockett & Hiemstra, 1991). Brookfield (1993), who approached the discussion from a critical lens perspective, persisted, though, arguing that SDL arose as a function of the "cultural tradition" (p. 227) in the individual's resisting the repression of hegemonic forces aligned against the individual's interests. Through time, Brookfield continued, that potent political act of SDL has been co-opted in adult education to become a tamed act of narrow self-interest, devoid of "political context, cultural contingency, and social construction" (p. 228).

In his argument noted here, Brookfield (1993) approached the social context, or absence thereof, from the perspective that adults engaged in their own learning do so, or should do so, to uncover the socio-political forces that work to subjugate the individual; yet the field of SDL, and adult education broadly, have muted what should be a political, emancipatory act. On a related note, Flannery (1993) argued that Brockett and Hiemstra (1991), in their SDL text:

> ignore…the socialization process to roles and to one's place in the social strata, the influences of group interaction on one's behavior, the relationships between persons' culture and persons' learning and communication styles, and issues such as cultural diversity the counter-hegemony of individual and group resistance to the imposition of contrary values. (p. 110)

In the above section, I discussed SDL's origins, how it is understood as both a process and as learner characteristics, and how it is measured. Additionally, I examined the criticisms of SDL. In the next section, I define grit, explore its development, identify the broad categories of its findings, discuss how it is measured, and then address its criticisms.

Exploring Grit

A decade ago, Duckworth et al. (2007) picked up a thread of a question posed by Henry James a century earlier. James' question centered on why some individuals more fully employ their mental capabilities while other individuals do not, staying only "half awake" (as cited in Duckworth et al., 2007, p. 1087). Duckworth et al. translated James' query into *Why do some individuals accomplish more than others of equal intelligence?* This inquiry spurred a decade's worth of research into not only understanding why some university students, military recruits, middle school spelling bee competitors, women lawyers, and other high achieving individuals out-learn, out-perform and outlast their peers, but also into predicting which individuals will succeed in attaining their goals in these respective groups.

Defining and Developing the Construct of Grit

In answering James' question, Duckworth and colleagues set out to reverse engineer *success* in high achievement individuals (Duckworth, 2016a). By examining what high achievers did – both attitudes and behaviors – they identified a noncognitive, trait-level construct they called *grit*. Grit is defined as "perseverance and passion for long-term goals" and "entails working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress" (Duckworth et al., 2007, pp. 1087-1088).

Soon after Duckworth et al.'s (2007) work was first published – presenting the findings from six studies about the construct of grit – a movement around grit began. Duckworth et al.'s

original work published in 2007 has been cited widely. As of early May 2018, the 2007 article had been cited 2,653 times, according to Google Scholar, 1,116 times on psycINFO, and 690 times on Web of Science search engines.

Within K-12 systems, scholars began applying interventions to develop grit (Duckworth & Seligman, 2009; Tough, 2013); additionally, practitioners and administrators began adopting grit-developing curricula to teach children how to respond to failure and frustration (Hoerr, 2012; Tough, 2013). Similarly, in higher education, scholars have questioned what role grit plays in academic performance and success among college students (see Arouty, 2015; Boatmun, 2016; Chang, 2014; Cross, 2013; Strayhorn, 2014; Weisskirch, 2016).

Factors of Grit

Duckworth et al. (2007), in their work to understand achievement, its predictors, and its relationships, developed the grit scale (as discussed in more detail below). Through the iterations of development and statistical analyses, Duckworth and her colleagues identified two factors: consistency of interest (passion) and perseverance of effort (perseverance). As part of the grit composite scale, these two factors have been repeatedly validated across contexts and populations in helping to explain variance in achievement (Black, 2014; Bowman et al., 2015; Cross, 2013; Duckworth et al., 2007; Duckworth & Quinn, 2009) and demonstrating significant correlations with achievement outcomes (Batres, 2011; Chang, 2014; DeCandia, 2104; Fillmore, 2015; Meyer, Markgraf, & Gnacinski, 2016; Wolters & Hussain, 2015).

Consistency of interest (passion). In her early work with paragons of achievement, Duckworth (2016a) found that these paragons have certain psychological assets in common (p. 89). Among these, *interest* was identified as the entrée into passion. Passion began by being intrinsically fulfilled when engaging in the activity in which the paragon achieved. The

consistency of interest is sustained by the purpose that it provides, both personally and professionally (p. 91). In the Grit-S scale, Duckworth and Quinn (2009) use four items that are designed to measure passion:

- I often set a goal but later choose to pursue a different one.
- I have been obsessed with a certain idea or project for a short time but later lost interest.
- I have difficulty maintaining my focus on projects that take more than a few months to complete.
- New ideas and projects sometimes distract me from previous ones.

Perseverance of effort. Perseverance is an element of the trait-level grit that, according to Duckworth (2016a), guides individuals in devoting themselves to "focused, full-hearted, challenge-exceeding-skill practice that leads to mastery" (p. 91). Perseverance allows individuals to sacrifice immediate and intermediate interests and desires for long-term achievement. In the Grit-S scale, Duckworth and Quinn (2009) use four items that are designed to measure perseverance of effort:

- I finish whatever I begin.
- Setbacks don't discourage me.
- I am diligent.
- I am a hard worker.

How Grit Develops

Duckworth (2016) has elaborated on how grit develops, based on her interviews with paragons of grit, like world-class musicians, Olympic and professional athletes, noted scholars, and highly successful entrepreneurs. She identified two ways in which grit develops – *from the*

inside out – and how it can be developed – *from the outside in*. *From the inside out* means that it comes from the interaction of an individual's mindset and behavior. Grit development, in this pathway, begins with interest. Interest, uncovered through the acts of trying and doing different activities, is a step toward passion. With the establishment of interest comes deliberate practice. Deliberate practice is planned, involving specific goals, full concentration and effort, immediate and informative feedback, and, lastly, repetition with reflection and refinement (p. 137). According to Duckworth, another step to developing passion, as part of grit from the inside out, is purpose, which she defines as the "intention to contribute to the well-being of others" (p. 143). Purpose moves a gritty individual's interest and practice beyond the realm of just goal-orientation; purpose connects a gritty individual's work or hobby to something beyond self-interest, something that adds value to others' lives. Finally, in developing from the inside out, grit requires hope. Hope is rooted in the optimism that a gritty individual possesses, wherein struggles and setbacks are reframed and recast as opportunities to grow, rather than reasons to crumble.

In discussing how grit can be developed, Duckworth (2016) argued that grit can be grown *from the outside in*. The rationale is that interaction with *other* – parents, coaches, teachers, bosses, mentors, and friends – can affect an individual's development of grit. The role of other in fostering grit involves being supportive with authentic affection *and* being demanding with high expectations, while helping individuals learn how to tackle challenges and persist in commitments. Further, Duckworth identified *a culture of grit* as path to growing grit in individuals. A culture of grit involves having shared norms and values among a group that are emblematic of *being* gritty (p. 244).

Grit Studies

Scholars have investigated grit's relationships and predictive values with a variety of outcomes, including both academic and nonacademic contexts, as well as cognitive and noncognitive factors among youth and adult populations. Among this variety of studies, researchers examined grit's relationship with class attendance (Batres, 2011), high school and college GPAs (Black, 2014; Bowman et al., 2015; Cross, 2013; DeCandia, 2014; Engel, 2013), first-year college retention (Arouty, 2015; Bowman et al., 2015; Chang 2014; Engel, 2013), university student engagement (Hodge, Wright, & Bennett, 2018), graduation rates (Hansen, 2016), women lawyers' attainment of partnership (Hogan, 2013), athletic performance (Joseph, 2009), engagement in youth sports (Larkin, O'Connor, & Williams, 2016), women's soccer teams (Meyer et al., 2016), persistence in adventure education (Davidson, 2016), work ethic, and even suicide prevention among children living in the slums of Mumbai, India, (Sundar, Qureshi, & Galiastsatos, 2016).

Findings

During my review of grit studies, I found a range of variables, contexts, and populations that researchers have studied. For the purpose of this study, I delimited the studies to be included by the age of population. I did not use studies with children, with the exception of Duckworth's foundational studies of grit and two neuroscience studies of children and adolescents. I did not delimit studies based on contexts. For example, I included studies that were situated in alternative high schools, law firms, and elite college athletes. I sorted the studies into academic performance (grit as a predictor and relationships with grit), retention/commitment (both academic and nonacademic), and an amorphous category of "other" that contains interesting, yet less easily categorized, findings.

Academic performance. Different measures of academic performance – semester grades and GPA – have been shown to be correlated with, as well as predicted by, grit, at both the construct level (composite grit score) and at factor levels (consistency of interest and perseverance of effort) for college students. However, when viewed collectively, study findings do not support overwhelmingly that grit is related to, let alone predictive of, grades.

Among the studies that did report significant relationships at the composite level, Black (2014) reported grit to be significantly related to GPA among first-year undergraduates (r = .275, p =. 006), as did Cooper (2014) who reported a significant relationship between grit and first-semester and second-semester GPA, but with small effect sizes (r = .14, p <.01; and r = .15, p <.05, respectively). Among doctoral students, Cross (2013) also reported a significant positive relationship between grit and GPA, but the effect size was extremely small at r = .093, p < .016. Credé, Tynan, and Harms (2016), in their meta-analysis of grit and academic undergraduate GPA, found that the average effect size was small, with r = .17 for 30 studies (N = 10, 526), which translates into variance accounted for of .02, meaning grit does not explain GPA in any meaningful way.

At the factor level, Bowman, Hill, Denson, and Bronkema (2015) found that, among undergraduate participants, perseverance of effort significantly, positively related to college GPA and was predictive of subsequent GPAs the next semester, more than consistency of interest correlated or was predictive. Also at the factor level, Weisskirch (2016) reported perseverance of effort as a predictor of estimated grades in undergraduate students. Similarly, while Chang (2014) reported that the grit composite score was not predictive of first-year GPA, she did, however, report the perseverance factor as predictive. Muenks, Wigfield, Yang, and O'Neal (2016) also found a factor-level difference in the predictive capability of grit, as only

perseverance of effort was predictive of grades, but not consistency of interest, for predicting college student grades.

Other studies have reported failing to find significant positive relationships between grit and academic outcomes in college. None of the studies by Batres (2011), Engel (2013), Stewart (2015), and Macdonald (2016) found a significant relationship between grit and GPA.

However, I did find one item of note: the possible role of grit when the population is vulnerable to attrition in college. Most research into grit and academic performance did not specify examining high-attrition populations. However, two studies that I reviewed did so. Strayhorn (2014), studying the relationship between grit and college grades among African American male students ($N = 140$) in predominantly white institutions, found a significant positive relationship ($r = .38$, $p < .01$) between grit and grades, as well as identified grit, after controlling for other variables, as incrementally predictive for grades among participants, with it accounting for 24% of the variance in grades. Wolf and Jia (2015) also examined a population with high attrition, as they looked at students ($N = 64$) in university computer programming course with a traditionally high failure rate. The scholars found grit to be predictive of student grades ($ß = 2.332$, $p = .002$). Like Strayhorn, Wolf and Jia found that grit had a significant, positive relationship with course grades, suggesting that grittiness can make a performance difference for a population that historically underperforms in a given context.

Retention / Commitment. Various studies in grit have examined its relationships with, and predictive capabilities of, retention – and what I also am conflating with the concept of commitment – in a diversity of contexts. Among the studies, scholars examined academic retention and non-academic retention, as well as both professional and personal dimensions of commitment.

Retention/commitment in academia. As with academic outcomes discussed above here too there are mixed findings on the relationships with, and predictive capabilities of, grit.

Arouty (2015) found that grit correlated with first-year college student (n = 110) retention (r = .25, p < .01). Similarly, Duckworth et al. (2007) found incremental predictive validity for educational attainment, when controlling for conscientiousness and other Big Five personality traits. However, Shishim (2012), in his study of undergraduates (N = 1040) and protective factors in their intentions to persist in college, found grit a far weaker predictor of intention to persist (r = .10) than other positive psychology factors, such as gratitude (r = .23) and hope (r = .27), all of which correlated at p < .01 level.

Commitment/commitment in nonacademia. Scholars have examined grit as a correlate and a predictor in disparate nonacademic settings. Eskreis-Winkler, Duckworth, Shulman, and Beal (2014) reported grit as a predictor of retention in employees who were more likely to keep their jobs, students who were more likely to graduate, and men who were more likely to remain married. Hogan (2013) found grit as an explanation for why some women lawyers attain the highest levels in elite *BigLaw* firms.

Other. As noted above, this category is a collection of interesting grit findings that do not fit easily into the two above findings categories.

Neural substrates. Two studies I found reported findings on the neural substrates of grit. Nemmi, Nymberg, Helander, and Klingberg (2016) examined the nucleus accumbens region of the brain in six-year olds (N = 27). Researchers found differences in the volume of the nucleus accumbens among participants were significantly associated with differences in grit scores. The nucleus accumbens region of the brain is associated with searching out rewards, regardless of delays or obstacles (p. 1688), and is thought to be involved in reinforcement and attention

(Carlson, 2013, p. 455). Therefore, the implication is that grittier participants' nucleus accumbens have greater volume, suggesting that the region of the brain responsible for reward, reinforcement, and attention are related to grittiness. An important note and limitation with this study is its small sample size; another limitation is the age of the participants, as human brains continue to develop well into the 20s (Carlson, 2013.)

While Nemmi et al.'s (2016) study used a small sample, Wang et al. (2016) examined the neural links of grit with a considerably larger sample (N = 217) of adolescents, and reported contrary findings. These researchers measured the participants' resting states of the dorsomedial prefrontal cortex (DMPFC); the DMPFC is involved in self-regulation, planning, goal setting, and formulating strategies (Carlson, 2013). The researchers then compared the participants' resting states with their individual grit scores. Wang et al. reported that participant grit scores were significantly negatively correlated with resting states of the dorsomedial prefrontal cortices. Even after controlling for general intelligence and the Big Five personality traits, the inverse relationship still held. Thus, Wang et al. argued that these findings may provide the neural link between grit and academic performance, although how to interpret the findings is yet unclear.

While the evidence from Wang et al. (2016) is intriguing, it is contrary to what one might expect to find, which is that the brain's region for control and planning would be positively correlated with grit, given grit is a compilation of behaviors including self-control. However, there could be another lens through which to understand these findings. Duckworth (2016a) has discussed something similar in her study (Duckworth et al., 2007) of undergraduates at an ivy league school. Duckworth et al. reported that students who had lower SAT scores (which is treated as a proxy indicator of general intelligence) and had higher GPAs also scored higher in grit. Duckworth's conclusion was that less intelligent, but grittier, students tried harder to

achieve their grades. So, perhaps, the connection to Wang et al.'s findings is that, while scholars might expect to find a positive correlation between grit and the DMPFC responsible for planning and controlling, for individuals for whom their neural bases of planning and control are less developed (based on imaging used by Wang et al.), those individuals work harder, which could explain the higher grit scores.

Inversely related to intelligence. As noted in the above section, several studies have reported a negative relationship between grit and intelligence. In a study of Ivy League undergraduates (N = 139), grittier participants outperformed their less gritty peers (Duckworth et al., 2007, p. 1093). Those participants with higher grit scores also had higher GPAs (r = .25, p < .01); and, when the researchers controlled for SAT scores, the relationship between grit and GPA strengthened (r = .34, p < .01). Further, grit was shown to be negatively related to SAT (r = -.20, p <.03), suggesting that grit and intelligence are inversely related.

Measuring Grit

Duckworth et al. (2007) set out to measure this noncognitive factor that had been referenced by James and explored by Hough that distinguishes itself from *just* intelligence and *just* effort in ascribing an individual's achievement. Duckworth and her colleagues developed the original grit instrument (Grit-Original [Grit-O]) to test their hypotheses regarding grit's relationship to high achievement, specifically that it was more than self-control or conscientiousness (p. 1089). In doing so, Duckworth et al. searched for an instrument that would meet four criteria, including "psychometric soundness, face validity for adolescents and adults pursuing goals in a variety of domains (e.g., not just work or school), low likelihood of ceiling effects in high-achieving populations, and, most important, a precise fit with the construct of grit" (p. 1089).

In the absence of finding an instrument that met all four criteria, Duckworth et al. (2007) designed the grit scale (Grit-O). Then Duckworth and Quinn (2009) revised the Grit-O to the Grit-Short scale (Grit-S) that retained the two factors of consistency of interest (passion) and perseverance of effort (perseverance) and eliminated four items, leaving the scale with eight items, using straight- and reverse-coding.

According to Duckworth and Quinn (2009), the Grit-S scale showed predictive abilities with educational attainment for adults, fewer career changes, as well as predicted GPA among adolescents, retention among West Point cadets, and final round attainment among national spelling bee competitors (p. 166).

Criticisms of Grit

The decade-long study into grit, however, has not been without critics, voicing a breadth of concerns. Critics' questions about grit include its trait-level veracity as something distinctly different from conscientiousness (Credé, Tynan, & Harms, 2016; Rimfeld, Kovas, Dale, & Plomin, 2016); the implications of persisting for the sake of persisting without using environmental and meta-cognitive feedback to guide one's efforts (Kohn, 2014; Miller & Wrosch, 2007); and the intersection of societal structures like racism and poverty with the message that hard work and persistence are all that matter on the road to success (Herold, 2015; Kohn, 2014).

"Old Wine in a New Bottle"

Among the criticisms of grit, the most often cited is whether grit is really anything new, or just "old wine in a new bottle" (Credé et al., 2016; Kamenetz, 2016; Kristjánsson, 2012). Kohn (2014) also asked if perseverance and consistency of interest are not simply "Christian

denunciations of sloth, and the 19th century chant invented to make" individuals do their work: *If at first you don't succeed, try, try again* (para. 6).

Similar to Kohn's (2014) questioning whether grit is anything new, Credé et al. (2016) argued that, conceptually, grit bears resemblance to other trait-like constructs, such as need for achievement, persistence, proactivity, and conscientiousness, as well as narrow facets of conscientiousness industriousness, self-control, and order. To this point, Credé et al. wondered if, perhaps, Duckworth and her colleagues, as well as other grit proponents, have "fallen victim to what Kelley [1927] referred to as the 'jangle fallacy' – the belief that two things are different simply because they have different names" (p. 4).

Thus, Credé et al. (2016) conducted a meta-analysis of grit studies, examining, among other variables, the collinearity of grit and conscientiousness of the empirical differences of grit and other conceptually-similar constructs. It is important to note here that conscientiousness – as defined by the Big Five personality assessment – is a personality trait, a function of genetics and environment. Credé et al., in their analyses of 22 studies (N = 18,826), found that grit scores and conscientiousness scores are correlated between r = .80 and r = .90 (Kamenetz, 2016).

Duckworth et al. (2007), in their original article on grit, stated that while grit and conscientiousness do share similar aspects, the difference between the two constructs lies in grit's "emphasis of long-term stamina rather than short-term intensity" of conscientiousness (p. 1089). Yet this is contrary to how other scholars (Costa & McCrae, 1992; Roberts, Bogg, Walton, Chernyshenko, & Stark, 2004) have described the narrow facets of conscientiousness and one's eschewing immediate gains for long-term goals. In a later response to the debate of grit and conscientiousness, Duckworth stated that grit is in the family of conscientiousness, but has its own predictive power for achievement (Kamenetz, 2016). Yet Credé rebutted stating

there is no evidence to support that claim (Kamenetz, 2016). The lack of evidence to which Credé was referring is suggested in Credé et al.'s (2016) meta-analysis that found, when controlling for conscientiousness, grit overall explained none of the variance in academic performance (p. 10).

Nonproductive Persistence

One of the first-order factors of grit is perseverance, defined as perseverance of effort (Duckworth et al., 2007). While perseverance of effort, on the surface, may appear to be worthy and necessary trait in achievement, as Duckworth has argued, some scholars have questioned accepting perseverance as wholly good. When perseverance is applied in a given context it may not necessarily be productive if the perseverance involved is not coupled with reflection-on- and reflection-in-action (Schön, 1987).

Kohn (2014), in his article *The Downside of Grit,* argued that perseverance in and of itself is not a value; instead, learners should be taught to evaluate the usefulness of their perseverance and to rely on environmental feedback and meta-cognitive skills. This notion has been echoed by Miller (2008) and McNulty and Fincham (2012), both of whom argued that character traits, overall, are not discrete with binary value. That is, traits operate dynamically and interactively (Miller, p. 599), with their values being a function of how they work for the individuals who possess them, and that the application of certain traits can be positive or negative as a function of the context in which they are used (McNulty & Fincham, p. 101).

Findings from studies (n = 426; n = 132; n = 830) by Lucas, Gratch, Cheng, and Marsella (2015) lend support to these criticisms. Lucas et al., in their studies of grit in undergraduate students engaged in online games worth monetary payouts, found that (a) grittier participants' perseverance in completing individual items came at the cost of completing the task overall; (b)

grittier participants increased effort when losing a game; and (c) when they were losing, grittier participants were still more likely to persist rather than to quit the game (p. 20).

These criticisms of grit appear to have face and empirical external validity. In response, Duckworth (Duckworth, 2016a; University of Delaware School of Education, 2016) has addressed the need to have, and use, environmental feedback to guide one's performance improvement. Additionally, and on a related point to the findings of Lucas et al. (2015), Duckworth has stated that the level of goal is an important distinction. Some individuals may be hardheaded and single-minded (which can look like grit), but for a lower-level goal, which would be counterproductive in the long-term for an overarching goal. As such, individuals need to be able to reflect on their actions to determine if it is meeting their overarching goals.

Types of Learning

Another criticism leveled against grit has been the type of learning involved in perseverance of effort. Related to the above criticism of nonproductive perseverance – not knowing when to stop persisting and revaluate one's actions – some grit critics have questioned what fostering and applauding grit actually teaches learners (Kamenetz, 2016; Kohn, 2014).

Kohn (2014) pointed to the findings from Duckworth's studies that indicated that students who were high in grit were also more likely to be conformists and less likely to be creative. He went on to question the type of learning that grit produces, suggesting that learners – particularly children – who are "gritty" may only be learning how to reproduce information through perseverance, instead of learning how to be creative by experimenting with trial-and-error. Further, Kohn has argued that there are other, more important strengths that should be fostered among learners, such as curiosity and self-confidence. Otherwise, society will be filled

with learners who simply accept and conform to the information that is provided, instead of challenging the status quo and seeking alternative perspectives.

Learner Contexts

As grit has captured the imagination and interest of educators and policy makers alike (Herold, 2015), some educators and scholars have begun to question if relying on grit as the equalizing tide that raises all boats is misguided (Herold, 2015), at best, and dangerously ignorant of societal factors (Kamenetz, 2016; Kohn, 2014), at worst. Among these critics, the questions focus on denying societal structures and contexts, such as poverty and racism and other societal disparities, in exchange for an overemphasis on causal reciprocity, of sorts, where in *belief* and *behavior* are enough to succeed. Duckworth has responded to this kind of critique by stating, "Duh, of course context matters" (UDSE, 2016).

Structural contexts. Among the anti-grit literature, one of the most consistently questioned propositions about grit is that Duckworth – in her zeal to promote hard work and stick-to-itiveness as the essential keys to success – sidesteps consideration of societal structures, such as "instability in housing, food insecurity, inequitable access to high-quality schools" (Gorski, 2016a, 2016b), that may keep one individual from achieving success, regardless of the personal effort and persistence invested. This criticism expands to the writ large tenet of positive psychology overall that the individual maintains choice and control for that individual's life and its trajectory.

While Seligman has framed positive psychology as the individual's intentional choices in developing character strengths and choosing to be optimistic in response to life's challenges (1999, 2002), Miller (2008), in his critical review of positive psychology, questioned the singularity of individual choice and response without examining the circumstances in which the

individual exists. Miller stated, "for most people most of the time, interests, passions, dreams, plans, goals, and purpose emerge out of life and circumstances as possibilities and opportunities arise (p. 595).

Similarly, Kohn (2014) argued that the wider field of positive psychology is "philosophically conservative in its premises, but also politically conservative in its consequences," propagating the belief that hard work and persistence alone are enough to direct and reform one's life trajectory and one's attainment of goals. Kohn used Paul Tough's assertion that "there is no antipoverty tool that we can provide for disadvantaged young people that will be more valuable than the character strengths…[such as] conscientiousness, grit, resilience, perseverance, and optimism" (in Tough's book *How children succeed*, as quoted in Kohn, 2014), to illustrate this charge.

Gorksi (2016b) has argued that "the most obvious trouble with grit ideology is that "of all the combinations of barriers that most impact the educational outcomes of students experiencing poverty…not a single one is related in any way to a student's grittiness" (p. 382). Therefore, the focus should be on addressing the disparities that produce these barriers, instead of shifting the responsibility to the individual to overcome – or *persevere* through – those barriers.

In response to the criticism that her work on grit has eschewed the implications of societal structures, Duckworth acknowledged that she has not specifically stated that scholars and educators, when looking to measure and develop the character of grit, should consider these societal structures and the resulting impediments because she thought it was not necessary. "My response was, like, *well, duh*. Of course, we cannot overlook students who are coming to school without food or stable housing, etc…and you can't disentangle the individual from the culture.

But we shouldn't be pitting inequality against character. Instead, we should address both. Instead of thinking one is more important than the other" (WGBH, 2016).

Non-Western contexts. Datu, Valdez, and King (2016) sought to validate the Grit instrument with a non-Western population. Datu et al. found that what they described as "cross-cultural differences" of grit (p. 121), demonstrated in the lower internal consistency of the instrument and in the structure – distinct dimensions rather than hierarchical – of the instrument. From this, the scholars have suggested that in collectivist cultures, perseverance of effort is more relevant (p. 121) in achievement.

In the above discussion of positive psychology and grit, I presented the genesis of positive psychology, as well as the identification and development of one of its constructs, grit. Through this discussion, I examined how grit is defined, how it is measured, and overall findings of grit studies in terms of academic performance, retention/commitment, and other findings of note. I completed this section with an overview of the criticisms of grit. In the next section, I will explore how SDL and grit – conceptually and empirically – intersect.

Intersections of Self-Directed Learning and Grit

The discussion thus far has explored SDL and grit, individually, including the conceptual and empirical findings, as well as the criticisms. In this portion of this review, I now turn to discuss the commonalities of these two constructs and their parent fields, both conceptually and empirically. I identify three areas of intersection: philosophy and ideology of adult education and positive psychology, learner characteristics, and contexts of SDL and grit. Where applicable, I identify subcategories of these.

Philosophy and Ideology

Humanism. Positive psychology, the parent field of grit, and adult education, the parent field of SDL, share in the roots of humanism. Grounded in the works of Rogers and Maslow, humanism plumbs the power, potential, and goodness of the human experience, exploring individuals' capabilities to make "deliberate, conscious decisions" (Kalat, 2017). Rogers, who regarded human nature as essentially good, believed that people strive for excellence naturally (Rogers, 1980, as cited by Kalat, 2017, p. 459). Similarly, Maslow believed that individuals could achieve their full potential (Kalat, 2017). As such, humanists viewed learning as a way in which to facilitate the development of one's potential; interpersonal relationships aided in the individual's development, and, collectively, this contributed to the "common good of humanity" (Cranton, 2006, p. 9).

Conceptually, positive psychology maintains much of its humanistic roots, as the field explores well-being, happiness, flourishing, gratitude, hope, perseverance, achievement, and more; however, there is a divergence in methodologies, in some regards. While humanism has examined personal perceptions and narratives (Kalat, 2017), early in positive psychology's establishment, Seligman and Csikszentmihalyi (2000) emphasized the need for an empirical methodology.

Thus, positive psychology straddles an apparent epistemological fence, with a postpositivistic perspective on one side (with its requisite methodologies) and a social constructionist perspective on the other where personal perception and reframing can change one's life trajectory. In its research methodologies, positive psychology has relied heavily on quantitative measures in determining the magnitude and frequency of character strengths; however, positive psychology also has emphasized the role of self-perception. For example,

Seligman has argued that life is about how individuals respond to events, and not about the events themselves, with an emphasis on the intentionality of choice. Another example comes from Dweck (2006) who has demonstrated that children, through interventions, will become more effortful when they believe intelligence is malleable and not fixed.

While the practice of adults engaging in SDL predates humanism as a subfield of psychology (Brockett & Hiemstra, 1991), the ideas are intertwined in the emphasis on the individual's personal agency and personal development. In adult education, broadly, the thumbprints of humanism are evident, as well as in SDL specifically (Brockett & Hiemstra, 1991). Within SDL, the emphasis rests upon the individual's choice, which is a function of internal states and external acts in the pursuit of learning. That pursuit is predicated upon interest, motivation, initiation of effort, meta-cognitive skills of reflection to monitor and self-regulate (Brockett & Hiemstra, 1991; Garrison, 1997), all of which are reflected in the language and literature of humanism.

Ideology of personal agency, society, and democracy. Weaving together threads of criticisms in the respective fields of SDL and grit, I identified an overarching theme of personal agency to affect one's success (however *success* may be defined), and how the framing of that agency and success can influence one's willingness and ability to engage fully in democratic society. Personal agency, as a criticism, focused on the social and political implications of individual-to-society, and, by my extension, democracy.

With grit, Kohn (2014) charged that focusing on, and actively fostering grit, can produce troubling outcomes, including learners being taught how to reproduce knowledge and how to persist, rather than how to question, reflect, examine, and resist, if needed. This single-mindedness to adopt, uncritically, what others (teachers, institutions, government) have

identified as that which is worthy of knowing, and then pursuing, fails to prepare learners to engage robustly in a democratic society. At the societal level, this acceptance of what is to be learned and replicated becomes doubly troubling for Kohn as the focus on individual character strengths, like grit, comes at the exclusion of other societal-level factors – such as poverty housing or food insecurity – that have been shown to impede individual growth and development.

Pawelski (2016), in his descriptive analysis of positive psychology concepts, also touched on concerns similar to those of Kohn's. Pawelski raised questions surrounding the complexities of who defines what is *good* or *positive* in the character strengths to be fostered. For example, do individuals set their own benchmarks for that which is aspirational, drawing on personal preferences informed by socioeconomic status, gender, age, and nationality? Or does a particular individual, or group, from a privileged position of power or political or religious authority determine what is *good* or *positive*; or, still yet, could the arbiter of *good* or *positive* be a divine being (pp. 353-354)? These complexities merit further exploration given the movement in education to foster these character strengths, because whoever defines that to which individuals and societies aspire holds the power. For example, asking *what are good or positive strengths* holds considerable potential to affect the directions of families, communities, societies, and nations.

Likewise, within SDL, Brookfield (1985) raised the criticism that SDL scholarship created a narrative wherein as individuals engaged in SDL they did so only informally, as contrasted with doing so as part of formal education. By creating that narrative, SDL scholars were (unintentionally) conveying to adult learners that their self-initiated learning was not legitimate; the only legitimate learning comes from the formal outside with its own agenda. The

fear then, according to Brookfield, was that adults would not see, value, or take the opportunity to use the agentic nature of their own SDL and apply it to changing their "individual and social environment and to create their own reality" (p. 69).

The commonality in these criticisms is the pitting of the individual against societal structure. For grit, the debate boils down to the concern that, in understanding why some individuals may succeed, too much emphasis is placed on individual character strengths or deficits, and not enough on the societal contexts in which those individuals operate. In SDL, the debate is the depowering of the individual (through delegitimizing his SDL agency) to affect societal change.

Within the context of doctoral student literature, the societal contexts can be understood as the department and institutional elements and structures that facilitate or hinder individual progression toward degree. Literature has suggested that these elements and structures include, for example, faculty availability and engagement, hidden curriculum, comprehensive exams that test reproducibility of content knowledge rather than synthetic and creative thinking, or lack of adequate funding (Lovitts, 2001; Lovitts & Nelson, 2005; Walker et al, 2008).

With grit, Duckworth (2016a) has stated that grit is not a substitution for fixing broken or inadequate systems that deny or limit access to equal resources. For example, she has acknowledged that some students come into college without these types of benefits, such as advanced placement courses, that other incoming college students have.

Learner Characteristics

Perhaps what lies at the heart of SDL and grit intersections are the characteristics of the individual. Informed by my review of the literature, I identified these characteristics: interest,

hope, self-regulation, and conscientiousness (see Figure 2). Here, I examine each of these through the lenses of SDL and grit.

Interest. Grit is defined as perseverance and passion for long-term goals (Duckworth et al., 2007). Passion is defined as consistency of interest. Interest, then, appears to be the entrée into grit. Duckworth (2016a), in describing paragons of grit, identified four characteristics that mature paragons possess: interest (in the topic or task), deliberate practice, purpose, and hope. Duckworth stated that all gritty, high achievers began their achievement behaviors with an interest. Interest serves as the seed from which passion grows.

Likewise, in SDL, a learner's interest in knowing about a certain topic, or activity, is the catalyst in the SDL process. As discussed above, SDL scholars (Brockett & Hiemstra, 1991; Candy, 1991; Merriam et al., 2007) conceptualize a learner's self-direction as a function of the learner's interest. Where a learner's interest lies, so, too, does that learner's self-direction. Together, grit and SDL share this conceptual foundation of the unique role of interest.

Hope. As noted in the above section, Duckworth (2016a) identified four characteristics of grit paragons, one of which is hope. In positive psychology, hope is defined as "expecting the best in the future and working to achieve it; believing that a good future is something that can be brought about" (Peterson & Seligman, 2004, p. 30). As a positive psychology construct, hope has been examined in a number of studies in a variety of contexts.

In terms of grit, Duckworth (2016a) described hope as a "rising-to-the-occasion kind of perseverance" that is part of each step toward achievement (p. 91). Hope is what allows individuals to get back up when life knocks them down, and, as such, Duckworth reported that hope is one of the four characteristics that mature paragons of grit possess, with interest, practice, and purpose as the others.

Duckworth's assessment of the role of hope is echoed in the empirical findings, as well. For example, Shishim (2012) found that the relationship between grit and hope had a significant, small to medium effect size (r = .27, p<.01) in his study (N = 1040) of undergraduate success and well-being. Credé et al. (2016), in their meta-analysis, which included Shishim's study, reported the relationship between grit and hope as a medium to large effect size (r = .42) across five studies (N = 2,378).

Other scholars have examined hopelessness and its relationships with grit and suicidiality (Pennings, Law, Green, & Anestis, 2015), as well as hope with grit and life satisfaction (Sheehan, 2014). In these studies, scholars reported a medium significant inverse relationship between grit and hopelessness (r = -.35, p <. 01) among military personnel (N = 934). Likewise, Sheehan (2014) found hope and grit significantly positively correlated (r = .439, p <. 01) among students (N = 93) enrolled in an alternative high school. In SDL, Dieffenderfer (2014) examined the constructs of hope and SDL, reporting a significant positive relationship between hope and SDL (r = .463, p < .01) within the context of the workplace (N = 129).

Collectively, hope appears as an intersection between SDL and grit. Studies indicated that hope is related to grit in a variety of contexts and hope is related to SDL within the context of the workplace.

Self-regulation. Not unlike SDL, self-regulation can be understood as a characteristic of a learner – self-regulated – and as a process – self-regulated learning, and it is very similar in both interpretations to that of SDL. Zimmerman (1989) defined self-regulated learners as those who are "meta-cognitively, motivationally, and behaviorally active participants in their own learning process," as they initiate and direct their learning efforts rather than relying on others (p. 329).

Cosnefroy and Carré (2014) examined the connections between, and divergences of, self-regulation and SDL concepts in the literature. In their meta-document analysis, they distinguished the concepts in two ways: self-regulation refers, generally, to students (children and adolescents) engaged in learning activities, and is studied under the purview of educational psychologists. SDL, however, focuses on adult learners engaged in learning projects (p. 3), and is studied under the purview of adult education scholars. While the contexts and learner populations differ, there is an intersection in that SDL, as a process, requires an element of self-regulation in the initiating, maintaining, and evaluating learning; yet, the scholars reported, very little research has sought to integrate SDL and self-regulated learning (p. 9). Pilling-Cormick and Garrison (2007) also explored the conceptual links between SDL and self-regulated learning. They argued that while SDL focuses on learner control of external tasks, self-regulated learning concerns a learner's control of the internal thoughts that drive SDL behaviors. The connection I see between these two concepts is that self-directed learners must employ self-regulation (meta-cognition and motivation) to attain their SDL goals.

Grit and self-regulation are conceptually related behaviors in that both involve activating and sustaining directed effort toward a goal. For self-regulation, studies have shown that it is related to academic performance (Muenks et al., 2016; Pintrich, 2004; Schunk, 2012). Through multiple studies, scholars (Duckworth et al., 2007; Duckworth & Quinn, 2009; Strayhorn, 2014) have suggested that grit is predictive of academic success, as it enables learners to initiate and maintain focus on their academic goals. On the surface, one might see that self-regulation is an essential element, as well. However, Duckworth and Gross (2014) have argued that, while similar, these constructs differ in two ways: first, self-regulation, while it can keep one from succumbing to temptations along the way toward attaining a goal, is not a part of overcoming

challenges; and, second, the timescale differs between grit and self-regulation, as grit is about attaining a goal over years, and even decades.

Yet, Wolters and Hussain (2015) investigated the relationships and predictive capabilities of grit and self-regulated learning among university students (N = 213). They reported strong significant correlations between perseverance of effort (one factor of grit) and seven dimensions of self-regulated learning. Likewise, Muenks et al. (2016) reported that self-regulation was even more predictive of grades than was grit.

Further support for the differences between self-regulation and grit may be found in a study by Wang et al. (2016) who examined the neural substrates of grit. In their studies, the researchers found that the area of the brain (DMPFC) that is responsible for self-regulation, when measured during a resting state, had lower frequency fluctuations among participants (N = 217) who also scored higher in grit. The DMPFC is the area of the brain responsible for self-regulation (among other activities). Thus, this finding suggested there may be an inverse relationship between self-regulation and grit.

While no studies, to my knowledge based on my literature review, have examined grit and SDL, it appears that, conceptually, these intersect through self-regulation. SDL requires initiating, maintaining, and evaluating one's learning with a specific learning objective. Grit involves a consistency of interest and a perseverance of effort directed toward a specific achievement goal. I suspect, however, that Duckworth would argue that – as with grit and self-regulated learning – the difference lies in the timeframe, which may be true when thinking in terms of outcomes. Still, in terms of process, an intersection lies in the maintenance of behavior toward a goal, for which self-regulation is necessary.

Conscientiousness. As discussed in the previously, much discussion has focused on the relationship between grit and conscientiousness, particularly as to whether these are distinct constructs, or, as Credé and others have questioned, grit is simply old wine in a new bottle. Credé et al. (2016), in their meta-analysis of several grit studies (N = 18,826), found grit to correlate significantly with conscientiousness very strongly (r = .84). This level of correlation suggests that the constructs are so strongly related that they could be the same construct. At the factor level, perseverance of effort also correlated strongly with conscientiousness (r = .83); however, consistency of interest showed lower correlation (r = .61). Duckworth (2016b; Kamenetz, 2016) has responded that grit is in the family of conscientiousness, but maintains that it is a distinctly different construct as conscientiousness – and its narrower traits, including perseverance – does not have the element of long-term effort time toward a goal.

In SDL, a similar discussion has occurred, as scholars have sought to detect the relationship between conscientiousness and SDL. Various scholars (Kirwan, 2012; Kirwan et al., 2010; Lounsbury et al., 2009) have reported significant positive correlations between the two constructs, but these are distinctly different constructs, as evidenced through statistical analyses.

While some uncertainty exists about the collinearity of grit and conscientiousness, this does not preclude drawing connections among SDL, grit, and conscientiousness. It appears the learner characteristics that enable individuals to be gritty and self-directed may happen at the trait level, provided interest is the catalyst to engage in the topic or task of learning. Further, individuals who are gritty and self-directed also possess a hopefulness that directs their effort toward learning goals and a self-regulation to assess those efforts.

Another intersection between SDL and grit is the role of context in the magnitude of the construct. Just as Miller (2008) argued that character traits are not discrete (existing and

operating in the absence of other traits and contexts), so too other scholars have suggested this about SDL and grit. These character traits do not demonstrate consistency, as how they are expressed is a function of interest.

To illustrate the role of context in grittiness, Duckworth (2016a) drew from the life of George Vaillant, noted psychiatrist and adult development scholar. Vaillant, according to Duckworth, is a paragon of grit in one aspect of his life – the completion of his longitudinal Harvard study on human development – yet that grittiness does not translate into other contexts of Valliant's life, such as persistence in completing home repairs or crossword puzzles that prove too challenging (p. 48).

In this same vein, Ralph Brockett, who has suggested that social context is an area of SDL requiring further research consideration (Donaghy, 2005), often has demonstrated the role of context-specificity by using examples from his own life. As an example, Brockett speaks to how his own high SDL helps him learn about the U.S. presidents, but how that self-directedness does not translate into other areas and demands of life that he does not value, such as gardening (personal correspondence, 2017).

The above section presented the intersections I identified between SDL and grit. I sorted the intersections into three categories: philosophy and ideologies, learner characteristics, and the role of context in SDL and grit. SDL and grit share humanistic roots with a focus on individual development toward greater life fulfillment, as well as a focus on personal agency and the implications thereof. With learner characteristics, these two constructs intersect in the shared relationships with interest, hope, self-regulation, and conscientiousness. Finally, both SDL and grit have elements of specificity as individuals may have self-direction and grit in narrow contexts rather than global approaches.

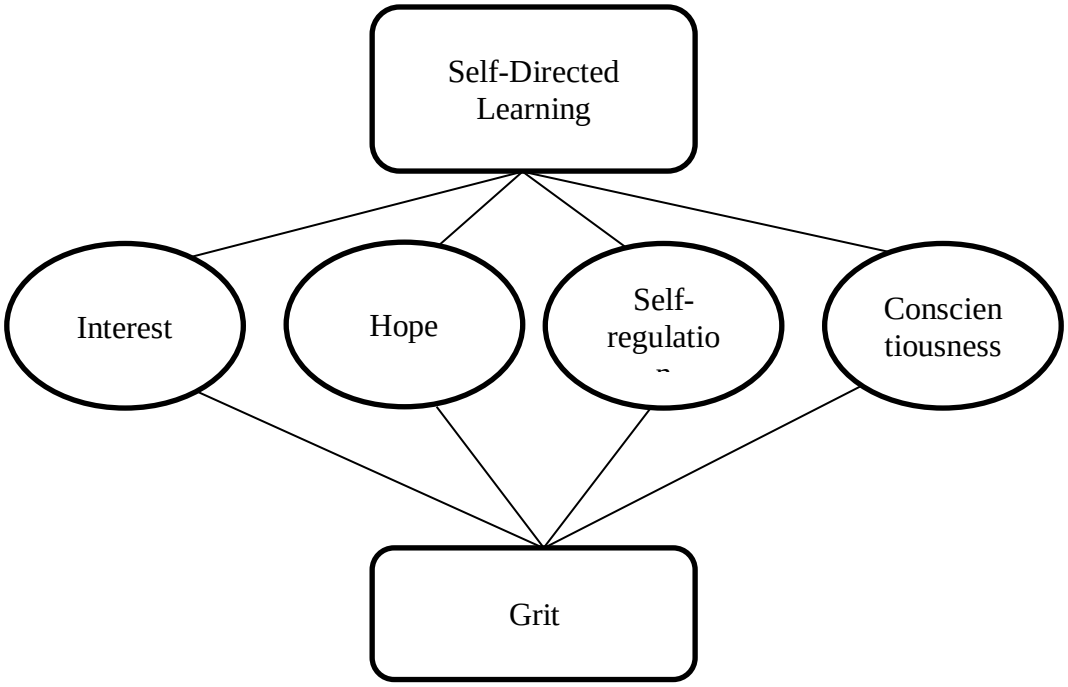

Figure 2: Learner Characteristics in Grit and Self-Directed Learning

PRO-SDLS Factors and Grit

As previously discussed, the PRO-SDLS has four factors: initiative, control, self-efficacy, and motivation. Although no other studies have examined SDL and grit, some studies have examined grit and its relationships with constructs that are operationally very similar to the factors Stockdale (2003) identified as part of SDL. Therefore, the below section examines each factor of the PRO-SDLS and some of the grit studies, where applicable, that investigated very similarly operationalized constructs.

Initiative

As defined above, initiative is the first step in an individual's proactively engaging in SDL, following the identification of a problem or question to be answered. Brockett and Hiemstra (1991) termed this *taking personal responsibility* (Stockdale & Brockett, 2011, p. 165). Stockdale and Brockett (2011), in referencing literature outside of the adult education field,

suggested that the action of initiative can be found in action control theory (Kuhl, 1994), help-seeking regulation (Karabenick, 2004), and academic volitional strategies (Diefendorff & Lord, 2003) (p. 165).

In my review of literature, I did not find studies that examined grit and initiative, or initiating learning. Following Stockdale and Brockett's (2011) suggestion noted above, I also searched action control theory, academic volition, and autonomy. However, I argue that taking initiative is related conceptually to interest, which, according to Duckworth (2016a) is the first step in developing grit from the inside out.

Control

According to Brockett and Hiemstra (1991), control within the context of learning is defined as "the ability and/or willingness of individuals to take control of their own learning." Similarly, Knowles, Holt, and Swanson (2005), in their discussion of the characteristics of adult learners, addressed the deep psychological need learners harbor to exert agency over their learning experiences; however, Hiemstra (1994) has suggested that control of the learning environment is rarely ceded to the learners. Stockdale and Brockett (2011) argued that having "personal control of the environment and choices about one's actions" (p. 164) are related to constructs of self-managed learning and self-regulated learning. Implicit in Brockett and Hiemstra's definition of control is self-control, as an individual must evaluate action and outcome in controlling self and in controlling the learning environment.

As noted in the previous section, the relationship with conscientiousness is one realm in which both SDL and grit studies have been conducted. As noted by Duckworth et al., (2007), individuals who are conscientiousness are self-controlled (p. 1089). Various grit studies have examined grit and control. For example, Steward (2015), in examining grit as predictive of first-

year college students (N = 83), found a significant positive relationship between self-control and grit (r =.47, p<.001). Similarly, Muenks et al. (2016) also reported significant positive relationship between self-control and grit among undergraduates (N = 336) (r = .67, p<.01).

Self-Efficacy

Self-efficacy is defined as one's perceived ability to complete a given task (Schunk et al., 2008). Stockdale and Brockett (2011) made the argument that self-efficacy is embedded into the SDL, as individuals' willingness to engage in specific acts of SDL is a function of their self-beliefs. As has been discussed regarding SDL, domain specificity is also relevant in any discussion, or measurement, of self-efficacy (Bandura, 1997; Pajares, 1996).

Novotny (2016) reported a significant positive relationship between self-efficacy and grit among counselors in helping professions (N = 132) (r = .25, p = .005). However, Coronado (2016), who also examined a professional population, found no significant relationship between self-efficacy and grit among high school teachers. In undergraduate populations, self-efficacy and grit have been found to be related. With an undergraduate population (N = 978), Shishim (2012) reported a significant positive relationship between grit and self-efficacy (r = .26, p<.01). Similarly, Slack (2014) found a significant positive relationship between self-efficacy for academic performance and grit (r = .375, p<.001) among undergraduates who were African American (N = 166). Finally, Rojas (2015) found a significant positive relationship between self-efficacy and grit (r = .33, p<.01), as well, among undergraduates (N = 817).

Motivation

Motivation refers to the process wherein goal-directed behavior is instigated and sustained (Schunk et al., 2008). Stockdale and Brockett (2011) referenced Deci and Ryan's claims regarding the role that motivation plays in self-directed learning, as Deci and Ryan (2000)

argued that "self-direction in learning takes place when the motivation for learning is intrinsic or extrinsically motivated but freely chosen" (Stockdale & Brockett, 2011, p. 166).

Numerous studies have examined some facet of motivation and grit. For instance, Von Culin, Tsukayama, and Duckworth (2014), in examining grit among adults (N = 15,874, N = 317), found that grittier adults were more likely to seek happiness through engagement, rather than through pleasure, and more likely to seek meaning. Piña-Watson, López, Ojeda, and Rodriquez (2015), in their examination of cultural aspects of grit and academic motivation among adolescents who were Mexican-American (N = 181), found the constructs had a significant positive relationship (r = .53, p<.01).

In the above section, I presented a sampling of grit studies that have examined constructs that are very similar operationally to the factors of the PRO-SDLS. Although no other studies to date have examined the relationship between SDL and grit, there are intersections between these two constructs at factor levels.

Conclusion

With this chapter, I delved into the literature of SDL and grit, building an understanding of the concepts/constructs individually, and an understanding of how they are related. I sought to explore the conceptual and empirical background of each concept, and, where applicable, provide the empirical findings of the respective constructs. Additionally, I discussed how each construct has been measured and the relevant instruments used. I also explored the intersections of the concepts/constructs. Finally, I presented the intersections of empirical findings between the PRO-SDLS factors and grit studies of very similarly operationalized constructs. In the next chapter, I present the method used in the current study. I return to the research questions and

present the research design. I also discuss the study population and sample, instrumentation, and data analyses.

Chapter Three

Method

Doctoral students are admitted to PhD programs after meeting programmatic and institutional requirements designed to select students capable of completing the years-long, intellectually-intensive process (Okahana et al., 2016). Most entrance requirements, and predictors of success, focus on students' cognitive abilities (e.g., GRE or other entrance exams); however, research indicates that cognitive capabilities, such as intelligence and its proxy indicators (e.g., SAT, ACT, GRE, LSAT) are not consistently more predictive of academic success than noncognitive factors (Duckworth et al., 2007; Duckworth & Quinn, 2009; Robertson-Kraft & Duckworth, 2014; Strayhorn, 2014).

In doctoral education, considerable investments of resources are required of students, program faculty, and institutions. As such, when doctoral students fail to complete their programs, the abandonment comes with real costs. Among these costs to the students can be student loan debt incurred for a degree that was not attained, as well as costs to the faculty and institutions for substantial investments of tuition waivers, research funding, and lower faculty-to-student ratio costs (Ferrer de Valero, 2001).

It is within this framework that I situated this study. Because of the investments made into doctoral student education by all parties, it is incumbent upon the academy to learn more about the phenomenon of doctoral student progression toward degree. Building on the work of Cross (2013), who examined grit among doctoral students, I proposed examining the constructs of SDL and grit to provide further description and insight into doctoral student progression toward degree.

As discussed in Chapter One, the purpose of this study was to examine the relationships among self-directed learning, grit, and progression toward degree among doctoral students. The following research questions explore these relationships:

1. What is the relationship between self-directed learning and grit among doctoral students?
2. What is the relationship between self-directed learning and age, self-directed learning and gender, and self-directed learning and stage in program?
3. What is the relationship between grit and age, grit and gender, and grit and stage in program?

In this chapter, I present the method for the study. This discussion includes the research design, population and sample, variables and instrumentation, procedure, and data analysis for each research question.

Research Design

To address these research questions, I designed an exploratory, correlational study to investigate the strengths and directions of relationships and to detect significant differences among variables of self-directed learning, grit, age, gender, and stage in program among doctoral students. Therefore, I wanted to determine if there were a significant relationship between SDL and grit among doctoral students. Further, I wanted to determine if there were significant relationships with, and differences in, SDL based on age, gender, and stage in the program. Finally, I wanted to determine if there were significant relationships with, and differences in, grit based on age, gender, and stage in the program. Descriptive statistics were used to check assumptions of distribution normalcy and to provide a profile of the sample; inferential statistics were used to detect significant relationships and differences within this sample based on age,

gender, and stage in program. The benefit of a correlational design lies in its ability to detect and describe relationships among variables, including the strength (magnitude) of the relationships and whether the relationships are positive or negative (direction) (McBride, 2016).

Population and Sample

The participants for this study were doctoral students in a college of education, health, and human sciences at a large, R1 public institution in the southeastern United States. The college of education, health, and human sciences has eight departments that confer PhD degrees. These departments are Child and Family Studies; Educational Leadership and Policy Studies; Educational Psychology and Counseling; Kinesiology, Recreation, and Sport Studies; Nutrition; Public Health; Retail, Hospitality, and Tourism Management; and Theory and Practice in Teacher Education. Within these eight departments, some offer only one PhD program, while other departments offer several different PhD programs and different concentrations within the programs. According to the institutional department that manages student enrollment data and that provided the contact information for the study's population, the total enrollment of doctoral students in these eight departments within the college of education, health, and human sciences was 298 in the Spring 2018 semester. All PhD students enrolled in the eight programs were invited to participate in this study. Of the 298 PhD students invited to participate, 121 prospective participants began the study. Of these, three individuals only completed a few items, requiring these cases to be removed. This yielded 118 participants, resulting in a 39.5% response rate.

For the 2017-2018 academic year, the graduate student enrollment, including masters and doctoral students, for this institution, overall, was 6,004 students, with 52.71% women and 47.28% men. In Spring 2018, the enrollment for the college of education, health, and human

sciences for all graduate students, which includes masters and doctoral students, was 836 students, 70.93% women and 29.06% men. While there was a difference in women-to-men enrollment percentages between the institution and the college of education, health, and human sciences, the college of education, health, and human sciences gender proportion was reflected in this sample's gender proportion of nearly a two-to-one (women-to-men).

Variables and Instrumentation

To measure the variables of SDL, grit, age, gender, and stage in program, I used two repeatedly-validated instruments – the PRO-SDLS (Stockdale, 2003) and Grit-S scale (Duckworth & Quinn, 2009) – as well as a demographic questionnaire. In the demographic questionnaire, in addition to asking age, gender, and stage in program, I also asked about students' employment and enrollment status. Collectively, this produced a 40-item survey that required about 10 minutes to complete.

Personal Responsibility Orientation to Self-Direction in Learning Scale (PRO-SDLS)

To assess doctoral students' SDL, I used the Personal Responsibility Orientation to Self-Direction in Learning Scale (PRO-SDLS). Stockdale (2003) developed the PRO-SDLS to operationalize Brockett and Hiemstra's (1991) original conceptual model of SDL, entitled the Personal Responsibility Orientation (PRO). The PRO model illustrates the interaction of the individual within the process of learning and the individual with his or her orientation to engage in the learning process, all of which occurs within a given social context (Brockett & Hiemstra, 1991, p. 25).

The PRO-SDLS is designed to measure two components – teaching-learning transaction and learner characteristics – within the context of higher education (Stockdale & Brockett, 2011). Within the teaching-learning component are two factors: initiative and control. Within

the learner characteristics component, there are two factors: self-efficacy and motivation (Stockdale & Brockett, 2011). The self-reporting instrument is a 25-item Likert-type scale that uses straight and reverse coding to minimize acquiescence (Stockdale & Brockett, 2011, p. 167). Each item's response options include: *Strongly disagree, Disagree, Unsure, Agree, Strongly agree*. Within the scale are four sub-scales (represented in the four factors noted above (see Table 3.1). Scores range from 25 to 125, with the assumption being that the higher the score the more self-directed participants are in their learning.

Table 3.1
PRO-SDLS: Components, Factors, and Items

Components	**Factor**	**Factor**	**Factor**	**Factor**
	Initiative	Control	Self-efficacy	Motivation
TL Component Items:	2,9,10,15,17,15	4,5,6,13,19,23		
LC Component Items:			1,7,12,21,22,24	3,8,11,14,16,18,20

The PRO-SDLS, designed for use in higher education, has been repeatedly validated and, as such, is a reliable instrument for this population and study. To establish validity, Stockdale validated the PRO-SDLS using expert judgment; criterion validity through correlations between SDL and GPA (within higher education contexts); convergent validity through correlations between the PRO-SDLS and Guglielmino's (1977) SDLRS instrument; and construct validity (Stockdale, 2003). Stockdale and Brockett (2011) reported a Cronbach's α of .91 for the scale, overall, and for the sub-scales reported initiative α = .81, control α = .78, motivation α = .82, and self-efficacy α = .78 (p. 170). This instrument has been used in various studies that examined SDL among undergraduate and graduate populations (see Fogerson, 2005; Hall, 2010; Holt,

2011; Conner, 2012; Beard, 2016; Langshaw, 2017) with each reporting high reliability for the composite SDL score.

Grit-S Scale

As discussed in above sections, Duckworth et al. (2007) designed the original grit scale (Grit-O). Later, Duckworth and Quinn (2009) refined the Grit-O into a more psychometrically sound instrument for prediction at the factor level, called the Grit-S scale. The Grit-S maintained the hierarchical structure with two first-order factors of consistency of interest and perseverance of effort (Duckworth & Quinn, 2009). The self-reporting instrument is an 8-item Likert-type scale that uses straight and reverse coding; as noted, the composite Grit-S is composed of two subscales, consistency of effort (passion) and perseverance of effort (perseverance) (see Table 3.2). Each item's response options include: *Very much like me, Mostly like me, Somewhat like me, Not much like me, Not much like me at all*. Scores range from 8 to 40, with the assumption being that the higher the score the grittier participants are in pursuit of long-term goals. The Grit-O and Grit-S have been used in numerous studies since the development of both instruments. For example, I reviewed more than 100 grit studies in a wide array of contexts and populations that examined grit and its factors as both correlates and predictors of academic and nonacademic performance and retention, as well as neural substrates.

Table 3.2
Grit-S: Factors and Items

	Factor	**Factor**
	Passion (Consistency of Interest)	Perseverance (Perseverance of Effort)
Items:	1, 3, 5, 6,	2, 4, 7, 8

Duckworth and Quinn (2009) reported the strong predictive validity of the Grit-S scale, indicating that there is high test validity in that the Grit-S scale is measuring what it is intended to measure. Duckworth and Quinn also reported evidence of consensual validity for the Grit-S scale.

Duckworth and Quinn (2009), in their findings on the Grit-S in their initial four studies, reported reliability ranging from $\alpha = .73$ for West Point cadets ($N = 1{,}218$) to $\alpha = .83$ for Ivy League undergraduates ($N = 139$). Subsequently, most scholars have reported high reliability for the Grit-S (for example, see Black, 2014; Cooper 2014; Arouty, 2015; Strayhorn, 2014). However, other scholars noted relatively lower reliability. Datu et al. (2016) reported $\alpha = .59$ (p. 124), arguing that in a confirmatory factor analysis the two factors were only weakly correlated to one another and did not constitute a hierarchical structure, as Duckworth and others have reported. Datu et al. suggested that the lack of reliability could be attributed to cross-cultural differences with their population's ($N = 220$) collectivist, Filipino culture.

Demographic Information Form

The last element of the online survey was the demographic section that captured each participant's age, gender, stage in program, enrollment status (part-time enrollment or full-time enrollment), and employment status (employed full-time or not). In previous SDL studies, age has been shown to be significantly related to SDL. Stockdale and Brockett (2011) reported a modest but significant positive relationship between SDL and age. Using the PRO-SDLS, age correlates with the PRO-SDLS composite score ($r = .284$, $p<.01$) and the motivation factor score ($r = .339$, $p<.01$) (Stockdale & Brockett, 2011, p.173). Similarly, Fogerson (2005) found age and SDL (composite score) significantly related ($r = .287$, $p<.01$), as did Conner (2012) who reported age and SDL had a significant but weak relationship ($r = .202$, $p<.05$).

In examining grit and age, Duckworth et a. (2007, p. 1093) reported that age is a predictor of grittiness $F(4, 682) = 15.32$, $p<.001$. Cross (2013) reported significant differences in mean grit scores based on age in his examination of doctoral students $F(1, 664) = 10.08$, $p = .002$.

Differences in SDL and grit by gender have been examined by other scholars. In SDL literature, Stockdale (2003) reported no significant differences in mean SDL scores by gender. Holt (2011) found a significant difference by gender in only one factor – initiative – of the PRO-SDLS, stating that men reported having more initiative in directing their learning than did women, $t(488.97) = 3.67$, $p<.001$. With grit, Jaeger et al. (2010), in their examination of undergraduate engineering students, found that women were significantly gritter than their male counterparts, within each year of undergraduate education; yet, Cross (2013) did not find differences in grit by gender among doctoral students.

The stage in program item offered participants nine different choices to reflect their stages. The stages ranged from *Doing coursework* to *Have written final chapters and dissertation defense date is/will be scheduled*. While Cross (2013), whose work also examined grit among doctoral students, did not find significant differences in grit based on year in doctoral program, his design examined doctoral students based on a participant's year in program (*first year, second year, third year*). Given that there can be distinctions among same year doctoral students regarding their actual progression, I chose to use program milestones, rather than units of time.

Procedure

Upon receiving Institutional Review Board approval in January 2018 to conduct this research, I contacted the institution's department that manages student enrollment data to request

the email addresses for all doctoral students enrolled in the institution's college of education, health, and human sciences.

Qualtrics – the software used for the survey – is a program provided, and supported, by the institution. I have used this software extensively in courses I have taught; however, given the high importance of this data collection process, I consulted with personnel at the institution's information technology department to ensure I had designed the survey correctly for my purposes.

After receiving the list of doctoral student emails, I sent an email from within Qualtrics to all doctoral students within the college of education, health, and human sciences. The email's text was the invitation to participate in the study and a link to the survey. If prospective participants followed the link to the survey, the first page was the Informed Consent Form (see Appendix A). At the Informed Consent Form page, invitees chose either "yes" to consent to participate or "no" to not consent to participate. When invitees chose "yes," they then entered the study with the page forward arrow. When invitees chose "no," and clicked on the page forward arrow, they received a message thanking them for their time. If invitees clicked on the page forward arrow without choosing "yes" to consent, they received the same message as if they had chosen "no" to consent. If invitees chose to participate in the study, they first completed the 25-item PRO-SDLS, then the Grit-S, and, lastly, the demographic items and the stage in program item. The estimated time for completion was about 10 minutes.

On March 1, 2018, I launched the survey, emailing all doctoral students enrolled in the college of education, health, and human sciences with the invitation to participate. As noted in the invitation, the survey was to remain open for 30 days. Although I did not offer any incentives to participate, I had hoped that invitees – fellow doctoral students – would choose to

participate as it was an opportunity to think about, and reflect upon, their doctoral journeys. After two weeks, I initiated a follow up email, reminding participants about the study and asking for their participation. The study was scheduled to close on March 29, 2018. A few participants completed the survey after this date, and I did include their data.

Data Analysis

The collected data were imported from Qualtrics into SPSS for analysis. I began by cleaning the data. Of the 121 participants who clicked "consent to participate," three cases were eliminated because the participants only answered the first few items. This left 118 cases. Of these, six cases were missing one item response each; none of these cases had more than one item incomplete. For each of these missing data points, I assigned a "3," as each scale (PRO-SDLS and Grit-S) was a five-point Likert-type instrument. I chose to assign a value of 3 for each missing data point as a neutral value.

After cleaning the data, descriptive statistics were conducted to check assumptions of normalcy in the distributions and to generate a profile of the study's sample. Next, tests for reliability were conducted for the PRO-SDLS and Grit-S instruments, checking for internal consistency of items by using Cronbach's alpha. Internal consistency of a scale represents to what degree an instrument's items relate to one another and to what degree will those items will consistently measure whatever it is designed to measure; ranging from 0 to 1, the resulting coefficient indicates the strength of internal consistency, with a higher number indicating greater consistency (McBride, 2016; Nunnally, 1967; University of Virginia Library [UVAL], 2015). To qualify as a reliable scale, a minimum acceptable coefficient is .60 or .70; however, it is preferable to have the coefficient closer to .9 (Aron, Aron, & Coups, 2005). Cronbach's alpha

results were comparable with previous studies that used these instruments, and the results were within the recommended range of acceptability for a coefficient of reliability.

Below are the three research questions that guided this study. With each question, I describe the analyses that were performed.

Research Question 1: What is the relationship between self-directed learning and grit among doctoral students?

After reviewing the descriptive statistics, it was determined that the data for both the PRO-SDLS and Grit-S were normally distributed in this sample, which meant parametric analysis was acceptable. Therefore, a correlation was conducted between the composite scores of the PRO-SDLS and the Grit-S. Next, a correlation was conducted between the composite PRO-SDLS scores and the Grit-S factors (consistency of interest [passion] and perseverance of effort [perseverance]). Similarly, a correlation was conducted between the composite Grit-S scores and the PRO-SDLS factors (initiative, control, self-efficacy, and motivation). Finally, a correlation was conducted between all factors of both the PRO-SDLS and Grit-S scales.

Research Question 2: What is the relationship between self-directed learning and age, self-directed learning and gender, and self-directed learning and stage in program?

In examining the relationships between SDL and demographics of age and gender, and SDL and stage in program, various tests were conducted. First, a Pearson's product-moment correlation was conducted to examine the relationships between the PRO-SDLS (composite and factor) scores and age. Next, an independent samples t-test was conducted to determine if significant differences in the PRO-SDL (composite) scores existed by gender; a MANOVA was conducted to determine if significant differences existed in the PRO-SDLS factors by gender. Then, because stage in program is an ordinal variable, a Spearman's rho test was conducted to

examine the relationship between the PRO-SDLS (composite and factor) scores and stage in program.

Research Question 3: What is the relationship between grit and age, grit and gender, and grit and stage in program?

In examining the relationship between grit and demographics of age and gender, and grit and stage in program, various tests were conducted. First, a Pearson's product-moment correlation was conducted to examine the relationships between the Grit-S (composite and factor) scores and age. Next, an independent samples t-test was conducted to determine if significant differences in the Grit-S (composite) scores existed by gender; a MANOVA was conducted to determine if significant differences existed in the Grit-S factors by gender. Then, because stage in program is an ordinal variable, a Spearman's rho test was conducted to examine the relationships between the Grit-S (composite and factor) scores and stage in program.

Conclusion

The purpose of this study was to examine the relationships among self-directed learning, grit, and progression toward degree among doctoral students. A sample of 118 doctoral students within a college of education, health, and human sciences was collected. Participants completed two validated instruments – PRO-SDLS (Stockdale, 2003) and Grit-S (Duckworth & Quinn, 2009) – as well as answered demographic information of age, gender, enrollment status, and employment status, and identified in what stage they were in their respective doctoral programs. Following institutional approval to conduct research, data collection began on March 1, 2018, and ended April 5, 2018. The survey was administered online using Qualtrics. In the next chapter, I will present analysis of the data for each of the research questions.

Chapter Four

Data Analysis

The purpose of this study was to examine the relationships among self-directed learning, grit, and progression toward degree among doctoral students. To answer the research questions that were presented in Chapters One and Three, data were collected from 118 participants. In this chapter, I present the analysis of the data, beginning with a description of the sample. Then I will address the validity and reliability of each of the instruments and present the results of the analyses. Finally, I will present the results for each of the research questions.

Overview of the Sample

As noted previously, total enrollment for doctoral students within the college of education was 298, which is the number of emails distributed inviting doctoral students to participate. Of the possible 298, 121 invitees clicked on the "consent to participate" option within the Qualtrics survey. Of these, three participants completed only a few of the items; therefore, their data were removed. This left 118 remaining participants. Of these, four participants omitted answering one item each in the PRO-SDLS instrument and two participants omitted answering one item each in the Grit-S instrument. No participant omitted more than one item. For the missing items, a value of "3" was assigned as it provided a numerically neutral value for both instruments' 1 – 5 Likert-type scales.

Demographics

Of the participants who reported their ages (n = 115), the range in age was 21 to 71, with a mean age of 33.8 years old (SD = 9.4) (see Table 4.1). In reporting their gender, participants (n = 118) were provided three options: woman, man, non-binary. More than 65% of the participants were women (n = 77) and 34.7% were men (n = 41) (see Table 4.1). More than 73%

of the participants (*n* = 87) reported being enrolled full-time, while 26.3% reported half-time enrollment (*n* = 31) (see Table 4.3). Most participants – 58.5% – were not employed full-time (*n* = 69), while 41.5% (*n* = 49) did report having full-time employment (see Table 4.1).

Table 4.1
Descriptive Statistics of Participants: Age, Gender, Enrollment Status, Employment Status

	n (%)	Range	Min	Max	Mean	SD
Age	115	50	21	71	33.82	9.43
Women	77 (65.3%)					
Men	41 (34.7%)					
Non-binary	0 (0%)					
Enrolled Half-time	31 (26.3%)					
Enrolled Full-time	87 (73.7%)					
Employed full-time: yes	49 (41.5%)					
Employed full-time: no	69 (58.5%)					

In addition to gender, age, enrollment status, and employment status, I asked participants (*n* = 118) to identify their stage in program during the Spring 2018 semester. For this variable, I separated the doctoral process into nine stages*:* *coursework* (Stage 1), *completed coursework but have not begun comprehensive exams* (Stage 2), *writing comprehensive exams* (Stage 3), *defended comprehensives exams* (Stage 4), *writing dissertation proposal* (Stage 5), *defended dissertation proposal* (Stage 6), *collecting data* (Stage 7), *completed data collection and writing final dissertation chapters* (Stage 8), *have written final chapters and dissertation defense date is/will be scheduled* (Stage 9).

Of the 118 participants, more than half (50.8%, *n* = 60) reported being in the course work stage. Ten participants (5.8%) reported having completed coursework, but not having begun their comprehensive exams. Four participants (3.4%) reported writing their comprehensive exams, while two (1.7%) have defended their comprehensive exams. Nineteen participants

(16.1%) reported writing their dissertation proposals, while six (5.1%) have defended their proposals. Six participants (5.1%) reported collecting data, while six (5.1%) have collected data and were writing their final dissertation chapters. Finally, four participants (3.4%) reported having written their final chapters and were awaiting a defense (see Table 4.2.)

Table 4.2
Stage in Program of Participants

Stage in Program	*n*	%
Stage 1: Coursework	60	50.8%
Stage 2: Coursework completed, but have not begun comprehensive exams	10	8.5%
Stage 3: Writing comprehensive exams	4	3.4%
Stage 4: Defended comprehensive exams	2	1.7%
Stage 5: Writing dissertation proposal	19	16.1%
Stage 6: Defended dissertation proposal	7	5.9%
Stage 7: Collecting data	6	5.1%
Stage 8: Completed data collection and writing final dissertation chapters	6	5.1%
Stage 9: Have written final chapters and dissertation defense date is/will be scheduled	4	3.4%

Instrumentation

For this study, in addition to collecting demographic and stage in program data, I also used the PRO-SDLS (Stockdale, 2003) to measure self-directed learning and the Grit-S (Duckworth & Quinn, 2009) to measure grit. After exploring the demographic and stage in program descriptive statistics, descriptive statistical tests were conducted for means and standard deviations to compare with previous studies. Next, reliability analyses, using Cronbach's alpha tests, were conducted to assess the internal consistency of each scale and each subscale. I then compared these results with previous studies that used these instruments.

PRO-SDLS

The PRO-SDLS has 25 items with each item having a 5-point Likert-type scale. The range of scores is 25 to 125, with a higher score interpreted as one's having more self-direction in learning. The mean score for this sample was 97.86 (*SD* = 12.31), compared to Stockdale and Brockett's (2011) reported mean score of 80.05 (see Table 4.3). Other scholars have reported mean scores that were closer to this current study's mean score. (See Table 4.4 for the comparisons of mean scores for the scale and subscales with other studies.)

Table 4.3
Score Comparisons for the PRO-SDLS

	Stockdale & Brockett (2011)			Current Study		
	M	*SD*	*n*	*M*	*SD*	*n*
SDL Composite	80.05	12.47	195	97.86	12.31	118
Initiative	17.79	3.89	199	22.00	3.80	118
Control	20.24	3.66	197	23.71	3.63	118
Self-efficacy	22.09	3.48	199	25.24	3.48	118
Motivation	20.17	4.16	197	27.00	4.56	118

Table 4.4
PRO-SDLS Composite Score Comparisons

	Year	*N*	*M*	*SD*	Population*
Current study		118	97.86	12.31	D
Beard	2016	102	91.50	12.92	UG
Conner	2012	137	92.87	13.45	UG/M/D
Holt	2011	519	89.13	11.54	UG
Hall	2011[a]	110	89.62	10.03	UG
Hall	2011[b]	110	91.17	10.92	UG
Fogerson	2005	217	96.91	11.82	UG/M/D/O
Stockdale	2003	194	84.05	12.47	UG/M/D

[a]post-test; [b]pre-test; *UG undergraduate; M master's; D doctorate; O other (such as certificate)

Reliability. For the PRO-SDLS, Cronbach's alpha, which is a reliability coefficient value that ranges from zero to one, was .91 for the total scale; the subscales (factors) were as follows: initiative α = .80, control α = .78, self-efficacy α = .81, and motivation α = .81. This aligns with Stockdale and Brockett's (2011) reported Cronbach's α = .91; at the subscales (factors), Stockdale and Brockett reported similar coefficients: initiative α = .81, control α = .78, motivation α = .82, and self-efficacy α = .78 (p. 170). Finally, these reliability measures for this study are also consistent with reliability reports from other scholars (see Table 4.5).

Table 4.5
Cronbach's Alphas for the PRO-SDLS

	N	Composite	Initiative	Control	Self-Efficacy	Motivation
Current Study	118	.91	.80	.78	.81	.83
Langshaw (2017)	113	.81	.81	.78	.78	.82
Beard (2016)	102	.90	.72	.79	.83	.78
Conner (2012)	137	.90	.78	.74	.76	.79
Holt (2011)	572	.88	.73	.72	.79	.79
Hall (2011) post	110	.87	.72	.83	.79	.67
Hall (2011) pre	110	.84	.76	.78	.79	.41
Gaspar et al. (2009)	65	.89	.80	.81	.83	.83
Fogerson (2005)	217	.92	n/a	n/a	n/a	n/a
Stockdale (2003)	195	.91	.81	.78	.78	.82

Validity. Reliability is implicit to a valid measurement, in that for a measurement to be valid it first must be reliable. As discussed above, the reliability of the PRO-SDLS has been established, with both this sample's data set and with previous studies that used this instrument. Validity is defined as the soundness of the research findings; in short, validity is about whether the instrument is measuring what it is designed to measure (Gall, Gall, & Borg, 2010; McBride, 2016). Stockdale (2003) established content validity for the PRO-SDLS through expert

judgment; criterion validity through correlations between SDL and GPA (within higher education contexts); convergent validity through correlations between PRO-SDLS and Guglielmino's (1977) SDLRS instrument; and construct validity.

Grit-S

The Grit-S scale has eight items, with each item having a 5-point Likert-type scale. The range of scores is 8 to 40, with a higher score interpreted as one's having more consistency of interest (passion) and perseverance of effort (perseverance) for long-term goals. The mean for this sample was 3.75 (*SD* = 0.6), which appears higher than what Duckworth and Quinn (2009) reported when initially validating the scale (see Table 4.6). Compared to other studies, this sample's mean appears to be in the higher end of the range of reported means. (See Table 4.7 for the comparisons of means for the scale.)

Reliability. For the Grit-S, the Cronbach's alpha was .83 for the scale; the subscales (factors) were as follows: passion $\alpha = .73$ and perseverance $\alpha = .74$. These results align with Duckworth and Quinn's (2009) reported reliability (see Table 4.8), as well as align with other scholars' reported reliability measures (see Table 4.9).

Validity. As noted in the above PRO-SDLS section, there are different types of validity. For an instrument, there is "test validity," which means the "degree to which evidence and theory support the interpretation of test scores entailed by proposed uses of tests" (*Standards*, as cited by Gall et al., 2010, p. 136). Duckworth and Quinn (2009) reported the strong predictive validity of the Grit-S scale, indicating that there is high test validity in that the Grit-S scale is measuring what it is intended to measure. Duckworth and Quinn also reported evidence of consensual validity for the Grit-S scale.

Table 4.6
Score Comparisons for the Grit-S

	Duckworth & Quinn (2009)			Current Study		
	M	*SD*	*n*	*M*	*SD*	*n*
Grit-S Composite	3.4	0.7	1,554	3.75	0.6	118
Passion	2.9	0.9	1,554	3.30	0.7	118
Perseverance	3.7	0.7	1,554	4.19	0.5	118

Table 4.7
Grit-S Composite Means Comparisons

Scholar	Year	*N*	M	SD	Population*
Current Study		118	3.75	0.6	D
Muenks et al.	2016	336	3.31	0.6	UG
Arouty	2015	124	2.57	0.3	UG
Black	2014	97	3.29	0.6	UG
Strayhorn	2014	140	4.08	0.8	UG
Engel	2013	88	3.58	0.6	UG

*UG undergraduate; D doctorate

Table 4.8
Cronbach's Alphas for Grit-S (Duckworth & Quinn, 2009, p. 167)

Sample	N	Grit-S	Perseverance	Interest
West Point 2008	1,218	.73	.60	.73
West Point 2010	1,308	.76	.65	.74
2005 Natl. Spelling Bee	175	.80	.65	.76
Ivy League undergraduates	139	.83	.78	.79

Table 4.9
Cronbach's Alphas for Grit-S

Scholar	N	Grit-S	Perseverance	Interest
Current	118	.83	.74	.82
Datu et al. (2016)	220	.59	.58	.61
Muenks et al. (2016)	336	.72	.65	.41
Arouty (2015)	124	.82	n/a	n/a
Black (2014)	97	.77	n/a	n/a
Strayhorn (2014)	140	.87	n/a	n/a
Engel (2013)	88	.82	n/a	n/a

Analysis of Research Questions

In this section, I present the results for each of the research questions that I addressed in Chapters One and Three. Research Question 1 was designed to explore the strength and direction of the relationships between SDL and grit at both the composite and factor levels. Research Question 2 was designed to examine the relationships and difference of SDL and demographics of age and gender, and SDL and stage in program; likewise, Research Question 3 was designed to examine the relationships and difference of grit and demographics of age and gender, and grit and stage in program. I analyzed data using SPSS and report those results below within the research questions.

Research Question 1: What is the relationship between self-directed learning and grit among doctoral students?

After confirming the reliability of the scales, descriptive statistics were conducted to check the assumption of normalcy in distribution. Then, tests were conducted to answer this research question. To do so, a correlation was conducted to test the strength and direction of the relationship between SDL and grit, both at the PRO-SDLS and Grit-S composite score level and at the factor level for each construct. I used Pearson's product-moment correlation coefficient (Pearson's *r*) to measure the relationship between SDL and grit. Pearson's correlation coefficient ranges from -1.0 to 1.0, and represents the strength (magnitude) and direction (either negative or positive) of two variables' relationship (Jackson, 2010). This test is appropriate when the variables are measured with an interval or ratio scale (Jackson, 2010, p. 239). To interpret a Pearson's correlation coefficient at a .05 significance level, the effect size is considered. Effect size can be understood as .10 is a small effect, .30 is a medium effect, and .50 is a large effect (Aron et al., 2005). Any correlation coefficient equal to, or greater than, .90 is

generally understood to be measuring the same construct and demonstrative of collinearity (Aron et al., 2005; Jackson, 2010).

As noted in Table 4.10, Pearson's correlation coefficient was .70 (p<.001) for SDL and grit. This indicates a significant positive relationship with a large effect size between SDL and grit. However, to understand more clearly the relationship between SDL and grit, variance between the two variables was examined with *r* squared. Figure 3 illustrates in a scatterplot the significant positive relationship between SDL and grit.

Pearson's correlation coefficient is squared to produce a coefficient of determination, or variance accounted for (Jackson, 2010). According to Jackson (2010), the coefficient of determination is a "measure of the proportion of the variance in one variable that is accounted for by another variable" (p. 243.) The coefficient of determination (r^2) was .49. This value is read as a percentage; therefore, for this study, the value can be understood to mean that 49% of variance in participants' levels of SDL is accounted for by participants' levels of grit. In short, participants who are highly self-directed in their learning are also very gritty.

Table 4.10
Pearson's Product-moment Correlation Coefficient (r) between PRO-SDLS and Grit-S

Correlations		
		Grit-S
PRO-SDLS	Pearson Correlation	.70**
	Sig. (2-tailed)	<.001
	N	118
**Correlation is significant at the 0.01 level (2-tailed)		

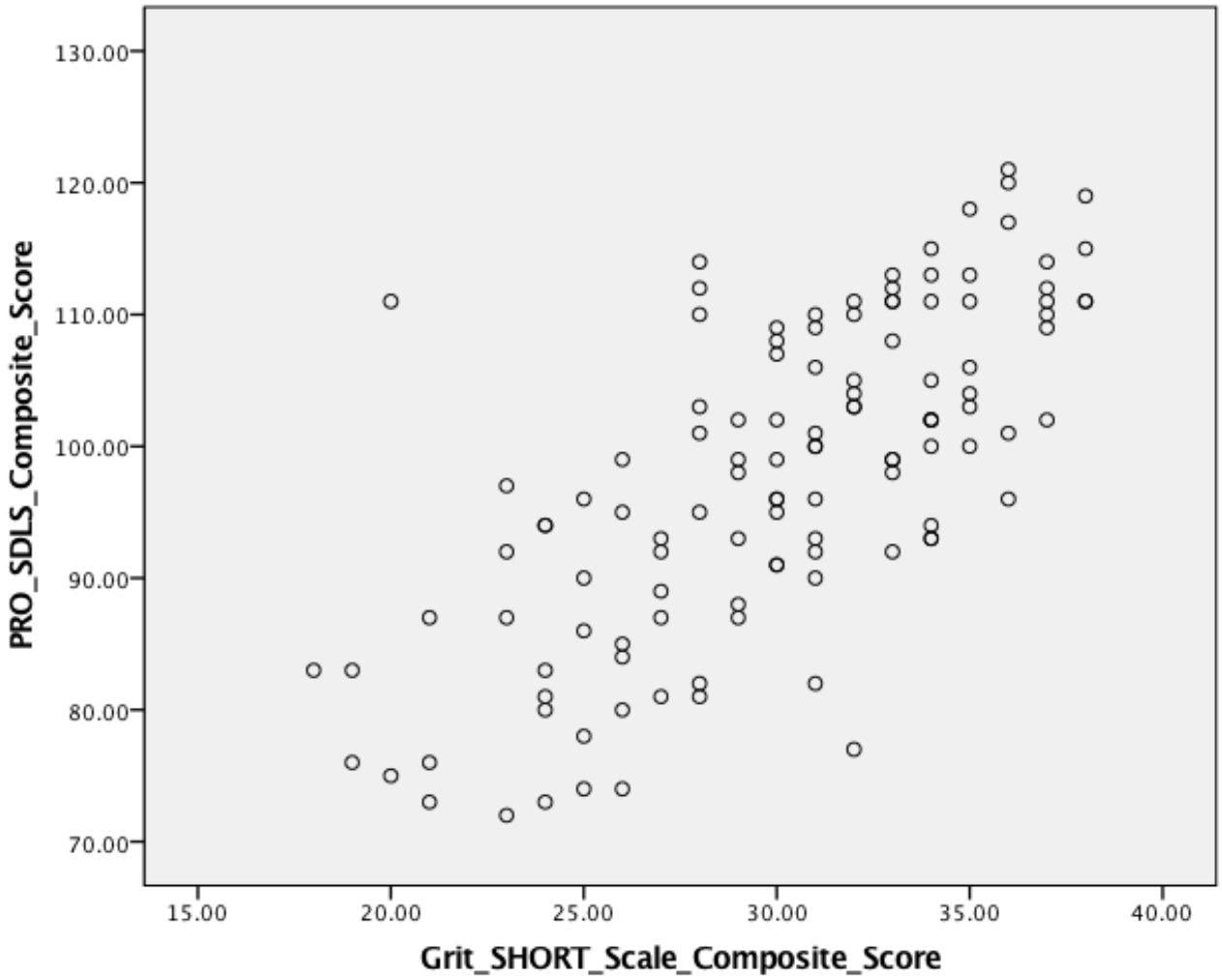

Figure 3: Scatterplot illustration of SDL and grit relationship

In addition to examining the correlation of the composite scores, correlations were conducted for each composite score with the factors of the other instrument. First, the PRO-SDLS composite score was correlated with the Grit-S factors. PRO-SDL scores had significant positive relationships with both consistency of interest (passion) and perseverance of effort (perseverance). As noted in Table 4.11, the results indicate that PRO-SDL had a significant positive relationship with consistency of interest (passion) (r = .56, p<.01) and a significant, positive relationship with perseverance of effort (perseverance) (r = .69, p<.01). Referring to the coefficient of determination (r^2) for the PRO-SDL and consistency of interest (passion), it can be understood that SDL accounts for 31% of a participant's consistency of interest (passion); and referring to the coefficient of determination (r^2) for SDL and perseverance of effort (perseverance), it can be understood that SDL accounts for 47% of a participant's perseverance of effort (perseverance).

Table 4.11
Pearson's Product-moment Correlation Coefficient (r) between PRO-SDLS and factors of Grit-S

Correlations			
		Consistency of Interest	**Perseverance of Effort**
PRO-SDLS	Pearson Correlation	.56**	.69**
	Sig. (2-tailed)	<.001	<.001
	N	118	118
**Correlation is significant at the 0.01 level (2-tailed)			

Next, correlations were conducted between the Grit-S composite scores and the PRO-SDLS factors. As noted in Table 4.12, grit had a significant positive relationship with each of the factors of the PRO-SDLS. Grit had a significant positive relationship with initiative (r = .38, p<.001) and with motivation (r = .53, p<.001) and control (r = .67, p<.001) Grit had

the strongest significant positive relationship with self-efficacy (r = .70, p<.001). With these coefficients in descending order of strength, it can be understood that grit accounts for 49% of the variance of in self-efficacy, 44% of the variance in control, 28% of the variance in motivation, and 14% of the variance in initiative.

Table 4.12
Pearson's Product-moment Correlation Coefficient (r) between Grit-S and factors of PRO-SDLS

Correlations					
		Initiative	**Control**	**Self-efficacy**	**Motivation**
Grit-S	Pearson Correlation	.38**	.67**	.70**	.53**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001
	N	118	118	118	118
**Correlation is significant at the 0.01 level (2-tailed)					

The final correlation examined the factors of the PRO-SDLS and the factors of the Grit-S. As noted in Table 4.13, all factors in the PRO-SDLS scale significantly correlated with each of the Grit-S factors. For initiative, there was significant positive relationship with consistency of interest (r = .23, p = .011) and with perseverance of effort (r = .46, p<.001). For control, there was a significant positive relationship with consistency of interest (r = .56, p<.001) and with perseverance of effort (r = .61, p<.001). For self-efficacy, there was a significant positive relationship with consistency of interest (r = .57, p<.001) and with perseverance of effort (r = .68, p<.001). Finally, for motivation, there was a significant positive relationship with consistency of interest (r = .45, p<.001) and with perseverance of effort (r = .51, p<.001).

In addressing Research Question 1, the data indicate that there is a significant positive relationship between SDL and grit. In Chapter Five, I will explore further the relationship and consider its implications.

Table 4.13

Pearson's Product-moment Correlation Coefficient (r) between Grit-S and PRO-SDLS factors

Correlations					
		Initiative	**Control**	**Self-efficacy**	**Motivation**
Consistency of Interest	Pearson Correlation	.23 *	.56**	.57**	.45**
	Sig. (2-tailed)	.011	<.001	<.001	<.001
	N	118	118	118	118
Perseverance of Effort	Pearson Correlation	.46**	.61**	.68**	.47**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001
	N	118	118	118	118
**Correlation is significant at the 0.01 level (2-tailed)					
*Correlation is significant at the 0.05 level (2-tailed)					

Research Question 2: What is the relationship between self-directed learning and age, self-directed learning and gender, and self-directed learning and stage in program?

In examining the relationships between SDL and demographics of age and gender, and SDL and stage in program, various tests were conducted. First, a Pearson's product-moment correlation was conducted to examine the strength and direction of the relationship between the PRO-SDLS (composite and factor) scores and age. As noted in Table 4.14, age had a significant positive relationship with the PRO-SDLS composite score ($r = .23$, $p = .013$). Age also had a significant positive correlation with PRO-SDLS factors of initiative ($r = .29$, $p < .001$) and motivation ($r = .25$, $p < .006$).

Table 4.14
Pearson's Product-moment Correlation Coefficient (r) between Age and PRO-SDLS, and factors

Correlations						
		PRO-SDLS	**Initiative**	**Control**	**Self-efficacy**	**Motivation**
Age	Pearson Correlation	.23*	.29**	.05	.14	.25**
	Sig. (2-tailed)	.013	.001	.580	.112	.006
	N	115	115	115	115	115
**Correlation is significant at the 0.01 level (2-tailed)						
*Correlation is significant at the 0.05 level (2-tailed)						

Next, I examined SDL and gender. An independent samples t-test was conducted to determine if significant differences in the PRO-SDL (composite and factor) scores existed by gender. A t-test is a parametric inferential test that compares the sample means of two, independent groups or samples (Jackson, 2010). No significant difference was detected by gender for the PRO-SDLS composite scores for women participants ($M_{\text{PRO-SDLS}} = 98.61$, $SD = 12.07$) and men participants ($M_{\text{PRO-SDLS}} = 96.46$, $SD = 12.78$), $t(116) = .901$, $p = .766$.

Likewise, a MANOVA found no significant differences by gender among the PRO-SDLS factors $F(4,113) = 2.202$, $p = .073$.

Finally, I examined SDL and stage in program. Because stage in program was an ordinal (or categorical) variable, a Spearman's rho was the appropriate test. A Spearman's rho test was conducted to examine the relationships between the PRO-SDLS (composite and factor) scores and stage in program. Like Pearson's, Spearman's rho yields an *r* value that represents the strength and direction of a relationship between two variables (Jackson, 2010). As previously discussed in this chapter, stage in program had nine categories: *coursework* (Stage 1), *completed coursework but have not begun comprehensive exams* (Stage 2), *writing comprehensive exams* (Stage 3), *defended comprehensives exams* (Stage 4), *writing dissertation proposal* (Stage 5), *defended dissertation proposal* (Stage 6), *collecting data* (Stage 7), *completed data collection and writing final dissertation chapters* (Stage 8), *have written final chapters and dissertation defense date is/will be scheduled* (Stage 9). These stages were treated as rank order and correlated with scores in the PRO-SDLS composite and factors. As noted in Table 4.15, no significant correlations were found among these variables.

Table 4.15
Spearman's Rho Correlations between Stage in Program and PRO-SDLS and factors

Correlations		
	Spearman's *rho* (n = 118)	***p* value**
PRO-SDLS Composite	.03	.711
Initiative	.06	.513
Control	-.01	.853
Self-Efficacy	.02	.806
Motivation	.03	.676
**Correlation is significant at the 0.01 level (2-tailed)		

Research Question 3: What is the relationship between grit and age, grit and gender, and grit and stage in program?

In examining the relationships between grit and demographics of age and gender, and grit and stage in program, various tests were conducted. First, a Pearson's product-moment correlation was conducted to examine the relationship between the Grit-S (composite and factor) scores and age. No significant relationship was found (see Table 4.16).

Next, I examined grit and gender. An independent samples t-test was conducted to determine if a significant difference in Grit-S (composite) scores existed by gender. As indicated in Table 4.17, a significant difference was detected by gender for the Grit-S composite score $t(116) = 2.33$, $p = .021$. This result indicates that women participants ($M_{grit} = 30.77$, $SD = 4.49$) were significantly grittier than men participants ($M_{grit} = 28.63$, $SD = 5.20$). However, a MANOVA test determined there was no significant difference by gender at the Grit-S factor levels, $F(2,115) = 2.822$, $p = .064$.

Finally, I examined grit and stage in program. Because stage in program was an ordinal (or categorical) variable, a Spearman's rho was the appropriate test. A Spearman's rho test was conducted to examine the strength and direction of relationships between the Grit-S (composite and factor) scores and stage in program. As previously discussed in this chapter, the stage in program had nine categories: *coursework* (Stage 1), *completed coursework but have not begun comprehensive exams* (Stage 2), *writing comprehensive exams* (Stage 3), *defended comprehensives exams* (Stage 4), *writing dissertation proposal* (Stage 5), *defended dissertation proposal* (Stage 6), *collecting data* (Stage 7), *completed data collection and writing final dissertation chapters* (Stage 8), *have written final chapters and dissertation defense date is/will be scheduled* (Stage 9). These stages were treated as rank order and correlated with scores in the

Grit-S composite and factors. As noted in Table 4.19, no significant correlations were found among these variables.

Conclusion

In this chapter, I first provided an overview of the sample along with the descriptive statistics to provide a profile of the sample. I then addressed the reliability and validity of the instruments. Following, for each research question, I presented the tests conducted and the results of each test. In the next, and final, chapter, I will interpret and discuss the relevant findings, connect those findings into the extant literature, and address future directions for research in this area.

Table 4.16

Pearson's Product-moment Correlation Coefficient (r) between Age and Grit-S, and factors

Correlations				
		Grit-S	**Passion**	**Perseverance**
Age	Pearson Correlation	.10	.03	.16
	Sig. (2-tailed)	.273	.677	.086
	N	115	115	115
**Correlation is significant at the 0.01 level (2-tailed)				

Table 4.17

Means for Grit-S and Factors by Gender

	N (%)	**Grit-S *M* (*SD*)**	**Passion *M* (*SD*)**	**Perseverance *M*(*SD*)**
Women	77 (65.25%)	30.77 (4.49)	13.72 (.35)	17.05 (.26)
Men	41 (34.75%)	28.63 (5.20)	12.31 (.49)	16.21 (.26)

Table 4.18

Spearman's Rho Correlations between Stage in Program and Grit-S and factors

Correlations		
	Spearman's *rho* (n = 118)	***p* value**
Grit-S Composite	.10	.276
Consistency of Interest	.05	.540
Perseverance of Effort	.10	.274
**Correlation is significant at the 0.01 level (2-tailed)		

Chapter Five

Summary and Conclusions

In Chapters One and Two, I introduced the study and then reviewed the literature of self-directed learning (SDL) and grit including the origins, measurements, and intersections of the constructs. In Chapter Three, I presented the correlational research design and the research questions guiding the study, as well as information about the population and sample, procedure, and data analysis. Then, in Chapter Four I presented the results of the data analysis with pertinent descriptive and statistical tests and outcomes. In this chapter, for each research question, I interpret and discuss the findings that were presented in Chapter Four. Then, I discuss the implications for practice and offer recommendations for practice. Finally, I suggest areas for future research.

Summary of the Study

The purpose of this study was to examine the relationships among self-directed learning, grit, and progression toward degree among doctoral students. Through examining these relationships, the goal of this study was to build upon the understanding of the relationship between SDL and grit, as well as continue the exploring doctoral student characteristics in the progression toward degree. As discussed in Chapter Two, previous studies have investigated descriptively and predictively SDL and grit constructs individually with various demographic and outcome variables, within undergraduate and graduate populations. However, no study to date has examined the relationships between these two constructs. As noted in Chapter Two, these constructs share empirical connections in at least four areas: interest, hope, self-regulation, and conscientiousness. Therefore, while there is no extant scholarship that explores the intersection between SDL and grit, this current study has the potential to further the bodies of

knowledge regarding SDL and grit and their relationship with doctoral student progression toward degree.

Upon receiving Institutional Review Board approval to conduct this research, I requested and obtained the email addresses for all doctoral students enrolled in a college of education, health, and human sciences at a large, R1 public institution in the southeastern United States. I then sent an email from within Qualtrics to all doctoral students (N = 298) within the college of education, health, and human sciences. The email's text was the invitation to participate in the study and a link to the survey. If prospective participants followed the link to the survey, the first page was the Informed Consent Form (see Appendix A). At the Informed Consent Form page, prospective participants chose either "yes" to consent to participate or "no" to not consent to participate. When prospective participants chose "yes," they then entered the study with the page forward arrow. If prospective participants chose to participate in the study, they first completed the 25-item PRO-SDLS, then the 8-item Grit-S, and, lastly, the demographic items of age and gender, and the stage in program item.

When the data collection period concluded, 121 prospective participants had begun the study. Of these, three individuals only completed a few items; therefore, I removed those cases. This yielded 118 participants, resulting in a 39.5% response rate. Data were exported from Qualtrics to SPSS for analysis. For the sample, 65% of the participants were women (n = 77) and 34.7% were men (n = 41), with the M_{age} = 33.8 years old (SD = 9.4) and an age range of 21 to 71 years old. For enrollment status, 26.3% (n = 31) reported half-time enrollment, while 73.3% (n = 87) reported full-time enrollment. For employment status, 41.5% (n = 49) reported being employed full-time, while 58.5% (n = 69) reported not being employed full-time. For stage in degree, the three most populous stages (of nine stages) were *coursework*

(50.8%, *n* = 60), *writing dissertation proposal* (16%, *n* = 19), and *completed coursework but not yet begun comprehensive exams* (8.5%, *n* = 10).

The mean score for the PRO-SDLS was 97.86 (score range of 25 to 125), and the mean of the means for the Grit-S was 3.75 (mean range 1 to 5). When compared to other studies using these instruments, the mean of PRO-SDLS scores appears higher and the mean of Grit-S means appears higher too, indicating that participants in this study report being very self-directed in their learning and very gritty.

Major Findings

For this study, I posed three research questions regarding these relationships. In this section I present the major findings of this study related to these questions.

1. Research Question 1 asked what is the relationship between SDL and grit among doctoral students. First, there was a significant positive relationship between SDL and grit ($r = .70$, $p<.001$). Second, when examining the PRO-SDLS composite score with the factors of the Grit-S, SDL had a significant positive relationship with consistency of interest (passion) ($r = .56$, $p<.001$) and a significant positive relationship with perseverance of effort (perseverance) ($r = .69$, $p<.001$). Third, when examining the Grit-S composite score with the factors of the PRO-SDLS, grit had a significant positive relationship with each of the four factors: initiative ($r = .38$, $p<.001$), control ($r = .67$, $p<.001$), self-efficacy ($r = .70$, $p<.001$), and motivation ($r = .53$, $p<.001$). Finally, when examining the factors of the PRO-SDL and the factors of the Grit-S, there were significant positive relationships among all the factors. Initiative had a significant positive relationship with consistency of interest ($r = .23$, $p = .011$) and perseverance of effort ($r = .46$, $p<.001$). Control had a

significant positive relationship with consistency of interest (r = .56, p<.001) and perseverance of effort (r = .61, p<.001). Self-efficacy had a significant positive relationship with consistency of interest (r = .57, p<.001) and perseverance of effort (r = .68, p<.001). Motivation had a significant positive relationship with consistency of interest (r = .45, p<.001) and perseverance of effort (r = .47, p<.001).

2. Research Question 2 asked what is the relationship between SDL and age, SDL and gender, and SDL and stage in program. First, age had a significant positive relationship with SDL (r = .23, p = .013). Second, age had a significant positive relationship with factor of initiative (r = .29, p<.001) and factor of motivation (r = .25, p = .006). No significant difference was detected in SDL by gender. No significant relationship was found between SDL and stage in program.
3. Research Question 3 asked what is the relationship between grit and age, grit and gender, and grit and stage in program. A significant difference was detected by in grit by gender $t(116) = 2.33$, p = .021; however, no significant difference was detected in either factor of grit by gender. No significant relationship was found between grit and age. No significant relationship was found between grit and stage in program.

Discussion

Doctoral education, as the extant literature has argued, is a complex, difficult, and, at times, opaque journey through a wilderness that requires one to take initiative and responsibility for self while developing as an independent scholar (CGS, 2004; Lovitts, 2005; Walker et al, 2008). These skills are emblematic of SDL and grit. SDL, as a learner characteristic and as a process of learning, involves an individual's initiating one's own learning with the ability and willingness to take control of, and evaluate, that learning; further, the individual believes he or

she has the ability to engage in a specific task and that he or she possesses the motivation to direct and sustain goal-directed behavior to accomplish the identified task (Brockett & Hiemstra, 1991; Stockdale & Brockett, 2011). Similarly, grit involves an individual having a sustained, consistent interest in a given task wherein that task is intrinsically fulfilling and has purpose; further, the individual possesses a reservoir of commitment to continue working toward mastery of a task, despite the difficulty and lack of feedback (Duckworth, 2016a). Herein lies the potential benefit of this study: Asking how SDL and grit are related and how these factors are related to doctoral study progression toward degree.

To date, no other studies have examined the relationships between SDL and grit in any context; however, there are three intersections of these two constructs in the literature I identified. First, among doctoral student populations, studies have examined the constructs separately. Second, scholars have examined constructs – interest, hope, self-regulation, and conscientiousness – with SDL and with grit. Third, grit studies have examined grit's relationships with constructs that are very similarly operationalized as the factors of the PRO-SDLS – initiative, control, self-efficacy, and motivation. In this next section, I address how SDL and grit are related empirically, based on the current study, as well as how each construct is related to age, gender, and stage in program.

Self-Directed Learning and Grit

In this study a very strong, significant positive relationship was found between SDL and grit among doctoral students ($r = .70$, $p<.001$). As discussed in Chapter Four, the Pearson's r value is squared to produce a coefficient of determination (r^2), which indicates the amount of variance shared by the constructs. Therefore, for SDL and grit, it can be stated that 49% of the variance in participants' grittiness can be attributed to participants' self-directedness in their

doctoral studies, and vice versa. This is interpreted as a very large correlation indicating a very strong relationship between SDL and grit among this sample (Hinton, 1995; Jackson, 2010).

The strength of this relationship is not wholly unexpected, given the conceptual and empirical literature, as I have discussed previously. SDL and grit share commonalities. Conceptually, the constructs both subsume characteristics of *agency*. Agency is understood as the capacity to plan, initiate, organize, self-regulate, and reflect on cognitions, affects, and behaviors (Bandura, 1989). As such, agency lies at the heart of pursuing a learning goal or task, wherein one must initiate goal-directed behavior, self-manage to sustain the goal-directed behavior, and possess self-efficacy beliefs regarding his or her capability in achieving the goal.

Empirically, SDL and grit are both related to conscientiousness, a personality dimension that reflects the above behaviors. Conscientiousness involves working hard, being dutiful, and striving for achievement and competence (Kalat, 2017, p. 465). Both SDL and grit have correlated with conscientiousness. Some scholars have argued that grit is simply a narrow dimension of conscientiousness (Credé et al., 2016). Other scholars have identified significant positive relationships between SDL and conscientiousness; however, the relationship was only moderately strong (Kirwan, 2012; Kirwan et al., 2010; Lounsbury et al., 2009).

I speculate that one area of divergence between SDL and grit may be a function of *time*. Although in this sample all participants are engaged in the long-term goal of completing a doctorate, I question if SDL alone would be enough to sustain long-term goal-directed behavior. Duckworth (2016a) has noted that what distinguishes grit from conscientiousness is the role of time – conscientious people may have the same grit-like behaviors in the short term, but they may not be able to sustain those behaviors in the long term, defined generally as at least a year. I question if SDL may facilitate long-term goal-directed behavior if interest were to waver.

Duckworth has argued that gritty individuals press on even through the mundaneness of repetitive practice. With Duckworth's descriptions of grittiness, I envision a flywheel that, once the goal-directed behavior begins, it sustains itself, storing potential energy to sustain behaviors and ward off mercurialness or capriciousness of interest. One caveat to this flywheel-like behavior is what Kohn (2014) argued regarding nonproductive persistence and the essential role that reflection and evaluation play in persistence; that is, persistence, without reflection-on-action, can lead to ineffective outcomes.

SDL and factors of grit. Examining SDL with the factor levels of the Grit-S, SDL had significant positive relationships with the factors of grit – consistency of interest (passion) (r = .56, p<.001) and perseverance of effort (perseverance) (r = .69, p<.001). Consistency of interest had a large effect size (r = .56), indicating a strong relationship with SDL. Perseverance of effort had an even larger effect size (r = .69), indicating a very strong relationship with SDL. As the variance accounted for, consistency of interest accounts for 31% of the variance in SDL, and perseverance of effort accounts for 47% of the variance in SDL.

These strong relationships make sense as SDL – as both learner characteristics and as a learning process – requires one to initiate learning based on an interest and then to maintain that learning endeavor through effort. The very strong relationship between SDL and perseverance raises an interesting question regarding the role of control and self-efficacy in an individual's perseverance when engaged in a learning activity or other goal-directed behavior. This suggests that individuals who are able to exert control in learning environments and who have self-efficacy regarding the learning activity or goal-directed behaviors are more likely to persist in their learning activities or goal-directed behaviors.

Grit and factors of SDL. Examining the factor levels of the scales, grit had significant positive relationships with all four factors of SDL – initiative (r = .38, p<.001), control (r = .67, p<.001), self-efficacy (r = .70, p<.001), and motivation (r = .53, p<.001). Examining these in descending order of relationship strength, the strongest relationship between grit and a factor of SDL was self-efficacy, with a very large effect size (r = .70) and very strong relationship. This relationship can be understood as self-efficacy accounting for 49% of the variance in grit. This finding is expected when viewed within the context of other studies that have examined grit and a form of self-efficacy (e.g. academic self-efficacy). Scholars who examined grit and self-efficacy within academic settings (for example Shishim, 2012; Slack, 2014; and Rojas, 2015) all reported moderate but significant positive relationships. As self-efficacy is one's belief in one's ability to complete a given task (Schunk et al., 2008), it seems self-perception plays a role in grittiness and in SDL.

Self-efficacy appears to be an essential component in grittiness, which – based on Duckworth's writing – is expected. Duckworth has repeatedly stated that gritty individuals persist toward their goals despite an absence of feedback (Duckworth et al., 2007; Duckworth, 2016a). Therefore, with the absence of feedback, it appears an individual's self-belief in ability and willingness to attain a goal is what matters. The findings in the current study support the relationship between self-efficacy and perseverance.

The next strongest relationship occurred with control, with a very large effect (r = .67) and very strong relationship, indicating that control accounts for 44% of the variance in grit. Control in SDL is understood as the ability and/or willingness of individuals to take personal control of the learning environment and control of their own choices regarding that learning (Brockett & Hiemstra, 1991; Stockdale & Brockett, 2011). The very strong relationship between

control and grit is expected, given the literature that has examined grit and a construct operationally defined as self-control. Stewart (2015) reported a strong, significant positive relationship between grit and self-control (r =.47, p<.001). In line with the finding from this study, Muenks et al. (2016) also found a very strong relationship between grit and self-control (r = .67, p<.01). As such, it seems that an individual's sense of control of self and the environment is a substantial part of being self-directed and being gritty.

Control seems to be an essential element of grittiness, wherein gritty individuals have a sense of agency when engaged in goal-directed activities. Duckworth (2016a) has stated that gritty individuals have growth mindsets, which is defined by as the belief that basic qualities can be cultivated (Dweck, 2006, p. 7). In short, it is the belief an individual holds that he or she "can learn to do better" (Duckworth, 2-16a, p. 180). Implicit to growth mindset is agency, in that one has control to learn to do better.

The third strongest relationship with the SDL factors occurred with motivation, with a large effect size (r = .53) and strong relationships, indicating that motivation accounts for 28% of the variance in grit. Motivation, defined as the process of goal-directed behavior being instigated and sustained (Schunk et al., 2008), has been found to be related to grit in other studies, as well. For example, Von Cullin et al. (2014) found that grittier adults are motivated in seeking happiness through engagement (rather than pleasure) and are more likely to seek meaning. Piña-Watson et al. (2015) reported a strong relationship between grit and academic motivation (r = .53, p<.01). Motivation, that which instigates and maintains behavior with a goal, is central to SDL and grit.

Motivation and its relationship to, and role in, grit is expected. According to Duckworth (2016a), grit can be fostered from the inside out – wherein the gritty individual is the one who

initiates and sustains goal-directed behavior, summoning the resources to push forward and not quit, even in the face of obstacles and despite feedback. The ability to motivate oneself and sustain that motivation is central.

Grit can be fostered from the outside in, according to Duckworth (2016a), wherein someone, such as a parent, teacher, or coach, provides support with authentic affection while also setting high expectations. The parent, teacher, or coach fosters grit in an individual by helping him or her to learn how to tackle challenges and persist in commitments. The teaching or modeling of how to tackle challenges and how to persist ties into the growth mindset. If an individual believes that his or her work in tackling a challenge today is tied to improved outcome tomorrow, he or she is motivated to persist.

The weakest relationship of the four factors occurred among initiative; yet the effect size was still medium (r = .38). This indicates that initiative accounts for 14% of the variance in grit. Although this was the weakest of the four factors, the relationship was still of moderate strength. As noted elsewhere, no grit studies have examined initiative, or a similarly operationalized construct; therefore, there is no reference against which to compare the current study's findings. Initiative, defined by Brockett and Hiemstra (1991) as taking personal responsibility, correlated the least not only with grit overall, but also at the factor level, as discussed below. When reviewing the initiative subscale items on the PRO-SDLS, these items seem to be about interest, leading me to expect that initiative and consistency of interest would have been more highly correlated. However, as noted below, these two factors had the smallest correlation among all relationships.

Factors of SDL and factors of grit. When examining the eight relationships among the two factors of grit and the four factors of SDL, all relationships were significant and positive.

The four strongest relationships occurred among self-efficacy and control in SDL with both factors of grit. The strongest relationship occurred between self-efficacy and perseverance of effort with a very large effect size (r = .68), indicating a very strong relationship with the variance accounted for between these two factors as 46%. The second strongest relationship occurred between control and perseverance of effort, with a large effect to very large effect size (r = .61), indicating a very strong relationship with the variance accounted for between these two factors as 37%. The third strongest relationship occurred between self-efficacy and consistency of interest, with a large effect size (r = .57), indicating a strong relationship with the variance accounted for between these two factors as 32%. The fourth strongest relationship occurred between control and consistency of interest, with a large effect size (r = .56), indicating a strong relationship with the variance accounted for between these two factors as 31%. The next strongest relationship occurred between motivation and perseverance of effort, with a medium-to-high effect size (r = .47), indicating a somewhat strong relationship with the variance accounted for between these two factors as 22%. Initiative and perseverance of effort also had a medium-to-high effect size (r = .46), indicating a somewhat strong relationship with the variance accounted for between these two factors as 21%. Similarly, motivation and consistency of interest had a medium-to-strong relationship (r = .45), indicating a somewhat strong relationship with the variance accounted for between these two factors as 20%. The weakest relationship among the factors occurred between initiative and consistency of interest (r = .23), which is a small-to-medium effect size, indicating a weak relationship with the variance accounted for between the two factors as 5%.

As discussed in the above sections, consistently in the findings, SDL factors of self-efficacy and control were the strongest relationships with grit, at both the Grit-S composite and

factor levels. This suggests the reciprocal and essential roles that self-efficacy and control have in grittiness, and the essential roles that consistency of interest and perseverance of effort have in self-direction. Perseverance appears to have strong reciprocal relationships with motivation and initiative, while consistency of interest does not appear to have that strong of a relationship with SDL factors of motivation and initiative.

SDL and Age, Gender, and Stage in Program

This study also examined SDL with demographic factors of age and gender, and with stage in program. Age had a significant positive relationship with SDL (r = .23, p = .013). The effect size (r = .23) was small-to-medium with the variance accounted for between the factors as 5%. Therefore, this suggests that while SDL may increase with age, this relationship is weak for this sample. This aligns with other findings that suggested a significant but modest relationship between age and SDL. For example, Stockdale & Brockett reported this relationship as r = .284, p<.01. Similarly, Fogerson (2005) found age and SDL significantly related (r = .287, p<.01), as did Conner (2012) who reported age and SDL had a significant but weak relationship (r = .202, p<.05).

In examining SDL by gender, no significant difference was detected. Previous research reported differing findings in SDL by gender. Stockdale (2003) also reported having no significant differences in SDL by gender; however, Holt (2011) did report a significant difference by gender in one factor – initiative – t(488.97) = 3.67, p<.001. For the current study, it could be such that SDL differences by gender are muted in a homogenous sample of high-achieving individuals, like PhD students.

In examining SDL by stage in program, no significant relationship was detected. Apparently, the participants who were further along in their programs did not perceive

themselves as more self-directed than those participants in the early stages of their programs. Given the attrition literature surrounding doctoral students, it would make intuitive sense that the participants who persist to late candidacy (post-comprehensive exams) would be more self-directed. However, I suspect that two explanations for failing to find any significant relationship between SDL and stage in program. First, participants in early candidacy (pre-comprehensive exams) may overestimate their self-direction in their learning, because coursework provides a structure for that learning and because they have not yet experienced the wilderness of the independent and solitary nature inherent to the latter stages of doctoral education. Second, another possible explanation for failing to find a significant relationship may come from compression of the sample; individuals who pursue doctoral degrees are self-directed in their learning already and that self-directedness does not change as they progress through their programs.

Grit and Age, Gender, and Stage in Program

This study also examined grit with demographic factors of age and gender, and with stage in program. The only variable that had significance was gender. A significant difference was detected by gender for grit, $t(116) = 2.33$, $p = .021$); however, no significant difference was detected by gender with either factor of grit. For this sample, women PhD students perceived themselves as grittier. Similarly, Jaeger et al. (2010) found that women undergraduate engineering students were significantly grittier than their men counterparts; however, Cross (2013) did not find significant differences in grit by gender among doctoral students.

While it is beyond the scope of this current study, I question if gender role conflict – defined as a "psychological state where gender roles have negative consequences" (O'Neil, Helms, Gable, David, & Wrightsman, 1986, p. 336) – may affect how women perceive their

grittiness. While gender role conflict is generally understood to have negative outcomes, for women PhD students it may affect their perceptions of their grittiness. For example, women PhD students have the responsibility of their studies, as well as may be chiefly responsible for child-rearing and running a household; as such, women PhD students may function in several roles (student, employee, parent, household manager) with diverse demands that lead to their perception as being extra gritty, because that is what their multiple roles require.

In examining the relationship between age and grit, no significant relationship was reported; however, other grit scholars have repeatedly found a significant relationship between age and grit (for example, Cross 2013) and age as a predictor of grit (for example, Duckworth et al., 2007). Although there was a range in age among the participants, the homogeneity of the PhD student sample may account for the failure to find a relationship. Doctoral students may simply be gritty, regardless of their age.

Finally, this study examined stage in program and grit. No significant relationship was detected between these variables. As with stage in program and SDL, apparently, the participants who were further along in their programs are not significantly grittier than those participants who are in the early stages of their programs. Again, as with SDL, it could be that compression of the sample is responsible for this finding; in short, individuals who are doctoral students are gritty overall.

Self-Directed Learning and Positive Psychology

As discussed in Chapter Two, various other studies have explored the relationships between SDL and constructs of positive psychology. Vess (2015, p. 6) described this as seeking to "build a bridge" between SDL and positive psychology. Recent studies have sought to build this bridge by examining SDL and gratitude (Vess, 2015), SDL and hope (Dieffenderfer, 2014),

SDL and resilience (Robinson, 2003), and SDL and self-determination (Stockdale, 2003). While significant relationships were found in these studies, none had the strength of relationship of SDL and grit. Robinson (2003) found a very strong relationship between self-directed learning readiness and the positive psychology construct of resilience ($r = .61$, $p<.001$). If, in the parlance of Vess, this is bridge building, then, in addition to SDL and resilience, SDL and grit seem to provide another, solid plank connecting SDL with positive psychology.

There are a few possibilities to explain why SDL and grit were the strongest connection between these fields. First, SDL and grit share commonalities in processes and individual characteristics. These commonalities include (a) an individual choosing to engage in learning about (SDL), or choosing to undertake (grit), a particular idea or activity with motivation that initiates and sustains that engagement or undertaking; (b) an individual exerting control on the learning (SDL) or practice (grit) process; and (c) an individual using evaluation (SDL) and feedback (grit) to assess their achievement in meeting initial goals.

A second possible explanation for why SDL has correlated the strongest with grit is the current study's population. Doctoral students are engaged in years-long learning activity that requires the types of processes and individual characteristics that are reflective of SDL and grit. Therefore, if the population were different wherein the population's activity was not the task of learning in a multi-year process, perhaps these constructs would not be so strongly related.

The empirical evidence found in this study appears to support Teal et al.'s (2015) theorizing of the interconnections between grit and SDL. Referring to the Model of Self-directed Wellness created by Teal et al., as discussed in Chapter Two, the scholars theorized that grit interconnected with SDL with two elements of Seligman's (2011) PERMA model – Engagement and Accomplishment. Teal et al. suggested that concepts and constructs of SDL that were

reflected in Engagement included learner control, learner autonomy, self-regulation, self-management, and goal directedness. The concepts and constructs of SDL that were reflected in Achievement included self-determination, motivation, mastery of goals/skills, and self-efficacy.

The strongest relationships among the factors of the SDL and grit were self-efficacy (SDL) and control (SDL) with perseverance of effort (grit), and then self-efficacy (SDL) and control (SDL) with consistency of interest (grit). As such, it appears that the empirical evidence strongly supports the Teal et al.'s theorizing that SDL, through the concepts of control and self-efficacy, is related to grit.

Implications for Practice

Beyond the attainment of technical and cognitive expertise, Walker et al. (2008) argued the essential function of doctoral education is the development of the learner into a scholar and steward of the discipline, taking the mantle of the discipline within the academy and within society at-large (Elkhana, 2006, pp. 66, 80; Walker et al., 2008, p. 8). This type of development, or "formation" as Walker et al. stated, requires doctoral students to move from a place of dependence to a place of independence. This movement into independence arises from doing scholarly activities, or *practice* – "guided, repeated, intentional, self-conscious effort" in developing the "skills, habits, and dispositions that fully prepare scholars to contribute to their disciplines" (p. 62). Implicit to this development that requires practice is action. Doctoral education is not simply attaining knowledge or *knowing*; it is attaining by *doing*. Actively *doing* scholarship, in moving from dependent learner to an independent scholar, requires processes of, as well as individual characteristics in, sustaining interest in the scholarly discipline, self-managing to persist in years-long practice, and self-evaluating that practice.

Herein lies the intersection with the processes and individual characteristics implicit to SDL and grit. SDL, as a process, is an individual's initiating, maintaining, and evaluating learning (Merriam et al., 2007) wherein the individual controls the learning environment and has characteristics of self-efficacy and motivation (Stockdale, 2003) while pursuing a given learning task or goal. Grit, while often viewed as an individual characteristic, is arguably more a function of *doing*: sustaining interest while continuing to invest effort in a given task or goal. Empirically, SDL and grit have both been shown to be related to academic outcomes; further, these constructs share a very strong relationship to one another. Therefore, both SDL and grit have practical applications within the doctoral education's essential function of developing scholars. In this section, I present the implications for practice for this current study. As part of this, I suggest ways in which SDL and grit can be incorporated into doctoral education. My goal is to make the implicit processes and characteristics of developing as a scholar explicit through the lenses of SDL and grit processes and characteristics.

Self-directed learning, much as the broader adult learning field, can be a non-field field; that is, SDL is so enmeshed into individuals' ways of being that it is rendered unseen and unacknowledged. Particularly among adults, there is a deep psychological need to have agency over one's learning and to engage in learning that addresses emerging problems of practice (Knowles, Holt, & Swanson, 2005). The need for agency and self-direction in learning among adults aligns with the processes and individual characteristics that are required in doctoral education. However, these connections are rarely made explicit in formal education, as educators maintain control of the content and processes related to the learning (Hiemstra, 1994; Lovitts, 2001; Walker et al., 2008). Therefore, to meet the needs of doctoral students as adult

learners and to foster their develop as independent, emerging scholars, it seems pragmatic to explicitly incorporate facets of self-directed learning into the *doing* (or practice) of scholarship.

As noted in previous chapters, grit has been shown to be related to, and predictive of, academic retention and success, beyond that of cognitive predictors, such as college admissions test score and GPA (Duckworth et al., 2007). Grittiness seems to be that element that helps individuals maintain focus in persisting toward their long-term goals. The factors of grit – consistency of interest and perseverance of effort – also appear to be elements of *doing* (or practice) of scholarship in one's transitioning to independent scholar (Walker et al, 2008). Therefore, grit appears to be a useful lens to understand, and provide language for, doctoral education and the abilities required in its pursuit. As such, it seems pragmatic to incorporate explicitly facets of grit into the *doing* (or practice) of scholarship.

To incorporate SDL and grit into doctoral education, I suggest the following:

- Regardless of the discipline, early in PhD programs or orientation sessions, program faculty can explicitly address the role of noncognitive abilities in persisting through doctoral education. Doctoral students already have met the threshold of cognitive abilities through admissions tests; however, the noncognitive abilities – like SDL and grit – can play a large role in academic persistence and, ultimately, success. By foregrounding the need for noncognitive abilities and then presenting these concepts, doctoral students will have the awareness and language to understand their future experiences and the tools to address them.
- As Teal et al. (2015) suggested in their Model of Self-Directed Wellness, there is potential for incorporating SDL and positive psychology elements, like grit, into individual learner development, as well as into curricular and programmatic designs. As

such, faculty can design learning activities, curricula, and programs to develop self-direction and grittiness among their PhD students.

- Duckworth (2016a) argued that grit can be grown from the outside in, with the rationale being the essential role of *other* – parent, teacher, mentor, coach, boss – in that grit growth. Faculty can foster grit among doctoral students by being supporting with authentic care and concern and by being demanding with high expectations, while helping individuals learn how to tackle challenges and persist in commitments. It is not simply enough to tell doctoral students that they must do those activities that are part of scholarship; faculty have to model and mentor doctoral students through those activities.

In the above section, I speculated on implications for the findings of the current study. I echoed the arguments of others: Doctoral education requires the formation of an independent scholar through *knowing* – having intellectual and technical expertise – and *doing* – having the skills and abilities to do scholarship. The doing requires actively developing and using the noncognitive skills of SDL and grit. To develop and apply these skills, I provided three implications: foregrounding doctoral student awareness of SDL and grit as noncognitive factors related to academic persistence and success; imbedding opportunities for SDL and grit development throughout curricula and programs; and, finally, modeling self-direction and grittiness by faculty for doctoral students to see what they are striving to become. Perhaps, through identifying and fostering SDL and grit among doctoral students, more students who begin the path to the PhD would reach the end, attaining their degrees. In the next section, I address future directions for research.

Future Directions for Research

As noted throughout this dissertation, no other studies have examined the relationship between SDL and grit. The current study detected a very strong, significant positive relationship at the composite level, as well as moderate to very strong relationships among the factors of the constructs. As this is the first study to examine this intersection, there is ample opportunity to continue to pursue this intersection both within, and beyond, the current study's focus. Below, I provide recommendations of areas for future research:

1. The current study examined doctoral students in one college of education, health, and human sciences in a large, R1 public institution in the southeastern United States. Although the eight PhD programs within the college of education, health, and human sciences had some variability in programmatic structure, it would be interesting to apply this study to a broader doctoral population, across academic disciplines with more variability in PhD programs. By doing so, the results may prove more generalizable.
2. While the current study focused on doctoral students with the rationale that SDL and grit could be instrumental in doctoral student degree completion, examining SDL and grit together among undergraduates could provide insight into undergraduate retention and persistence to degree. As considerable literature has addressed (see Kuh, 2016; Pascarella & Terenzini, 2005; Tinto, 2012), the phenomenon of undergraduate retention and graduation rates is an ongoing pursuit among colleges and universities. As such, SDL and grit may provide additional noncognitive lenses in understanding and addressing the retention of undergraduate students.
3. Research in SDL and grit overwhelmingly uses quantitative methodology. For the current study, I used this methodology as it was the appropriate option given the types of

questions I posed. However, I recognize that there are numerous other types of questions into the phenomenon that are best answered with a qualitative approach. For example, asking doctoral students to describe their lived experiences of being gritty and being self-directed in their studies would explore this phenomenon in a way that quantitative methodology is neither designed to do, nor capable of doing.

4. The current study did not detect any significant relationship between either SDL or grit and stage in program. As presented in Chapter Four regarding participants' stages in degree, the distribution of the sample heavily skewed toward pre-candidacy with more than 50% of the sample in coursework. Considerably fewer participants reported being in late candidacy (post-comprehensive exams). This was a limitation of this study; therefore, for future research, I encourage other scholars to use a stratified sample of participants across the stages in a doctoral program. With this type of sampling wherein each stage has an adequate number of participants (Gall et al., 2010), I suspect there is more opportunity to detect a significant relationship, if one exists.
5. As is the nature of this current study's methods, this study reflects a snapshot of these participants at a particular moment in their doctoral education. The limitation inherent to this approach is that it is indeterminable if how participants perceive their self-directedness and grittiness may change over time. Perhaps, as noted above, participants who are in coursework do not know the depth of their self-direction or grit until it is tested in late candidacy when they must navigate the solitude of writing a dissertation. Therefore, while that cannot be captured in this current study, a longitudinal study could address this and provide valuable insights regarding changes in SDL and grit as a function of time.

6. Nearly half of all individuals who undertake a doctorate will not complete their degrees, with this number increasing to 80% for the humanities and dropping below 50% for some of the sciences (Bair & Haworth, 1999; Council of Graduate Schools [CGS], 2004; Lovitts, 2001; Lovitts & Nelson, 2000; Nettles & Millet, 2006). As these would-be scholars leave their programs, so too do their voices (Lovitts, 2005), as evidenced by their absence in the current study. Therefore, I suggest to other scholars to be the voice of the voiceless by including non-completers in a study of SDL and grit among doctoral students' progression toward degree. In this current study, I detected no significant relationship with SDL and grit with stage in program. However, I question if I could have included non-completers then SDL and grit may have had a significant relationship with stage in program (or progression, overall).
7. The lens for the current study – and the theoretical frameworks – was rooted in humanistic psychology, which focuses on the potential and growth of the individual. As such, this study did not seek to explore or address the broader social contexts of its participants. The instruments used in this study are reflective of this focus on the individual. Therefore, I encourage critical scholars to explore the broader social contexts of, and the inequities inherent to, race, ethnicity, gender, socioeconomics, and age, within the academy and doctoral education. A critical lens can provide essential insights into the social factors affecting progression toward degree among doctoral students that this study, and others like it, simply cannot capture.

Conclusion

The purpose of this study was to examine the relationships among self-directed learning, grit, and progression toward degree among doctoral students. In doing so, I have offered

evidence in support of a very strong, significant positive relationship between SDL and grit among doctoral students. The relationship indicates that the more self-directed individuals are in their learning, the grittier they are, as well. Other findings of the study indicate that SDL increases with age and that women doctoral students are grittier than their male counterparts.

The importance of this study lies in understanding the relationship between these two noncognitive factors among doctoral students. Although no significant relationship was detected between the factors and stage in program, other scholars have reported on the importance of noncognitive factors in academic success (Duckworth et al., 2007) and in developing as independent scholars (Elkhana, 2006; Lovitts, 2001, 2005; Walker et al., 2008). Simply put, doctoral education requires more than intellectual and technical expertise; doctoral education requires noncognitive skills and abilities that are found in SDL and grit. With a focus on identifying and developing SDL and grit, perhaps attrition in doctoral education could be ameliorated.

As such, implications for practice were identified, including explicitly identifying the role of noncognitive factors of SDL and grit in doctoral education, imbedding development of SDL and grit within curricula and programs, and faculty's modeling self-direction and grittiness in scholarship. Additionally, areas for future research were identified, focusing on examining SDL and grit among doctoral students in other disciplines and among undergraduate populations. The other future directions focused on research design, such as qualitative methodology, longitudinal data collection, stratified sampling, and incorporating non-completers into the sample.

Personal Reflection

Chapter One began with a reference to a path. As I wrote "path," in my mind, I was envisioning Robert Frost's *The Road Not Taken*, likening doctoral education to the less traveled

path. Relative to the general population, few people pursue a doctorate, and fewer still attain a PhD. It is not a well-worn, or gentle, path.

My own path to this PhD has been filled with deep joy in, and reverence for, the emancipatory potential of adult learning and development, as I ventured further into the Life of the Mind. This path has brought me to deep, soulful friendships and mentorships. Along the way, I have had to side-step the stones of self-doubt and fear, and, when my father died in my third year, my path diverted briefly as I look a leave of absence to figure out life without him. While it's never been an easy or gentle path, it has been a *transformational* journey. My deepest gratitude to all who walked each step with me, guiding and supporting along the way toward my becoming a scholar.

Finally, to other doctoral students on this path and those individuals considering pursuing it, in the amended words of Will Smith, here's to getting gritty (and self-directed) with it.

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Appendices

Appendix A

Informed Consent Statement

Getting gritty with it: An examination of grit and self-directed learning among doctoral students

INTRODUCTION

This email is to invite you, as a doctoral student in the University of Tennessee Knoxville's College of Education, Health, and Human Services, to participate in a research study.

My name is Gwen Ruttencutter, and I am a PhD candidate in Educational Psychology & Research at UTK. I am conducting my dissertation research on doctoral students within the College of Education, Health, and Human Services.

The purpose of my study is to examine the relationships among grit (a construct from positive psychology defined as passion and perseverance for long-term goals), self-directed learning, and progression toward degree among doctoral students, as well as age and gender. Through examining these relationships, the goal of the study is to build upon the understanding of doctoral students characteristics and their persistence toward degree completion.

Your anonymous participation in this research study includes taking an online survey about your grit and self-direction in learning, as well as your stage in your degree 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, if 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 10 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

The benefits of this study are two-fold: First, there is a benefit to building further understanding in the characteristics of doctoral students and their persistence to degree completion; second, there is a benefit to you as a participant to learn more about, and reflect upon, your passion and perseverance in attaining long-term goals and your self-directedness in learning.

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, Gwen Scott Ruttencutter, at gruttenc@vols.utk.edu, and 229 506 9395 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 anytime 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.

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:

<insert Qualtrics link here.

Appendix B

Personal Responsibility Orientation – Self-Directed Learning Scale (PRO-SDLS) (Stockdale, 2003)

Each statement has the following choices:
___ Strongly disagree
___ Disagree
___ Sometimes
___ Agree
___ Strongly agree

1. I am confident in my ability to consistently motivate myself.
2. I frequently do extra work in a course just because I am interested.
3. I don't see any connection between the work I do for my courses and my personal goals and interests.
4. If I am not doing as well as I would like in a course, I always independently make the changes necessary for improvement.
5. I always effectively take responsibility for my own learning.
6. I often have a problem motivating myself to learn.
7. I am very confident in my ability to independently prioritize my learning goals.
8. I complete most of my college activities because I WANT to, not because I HAVE to.
9. I would rather take the initiative to learn new things in a course rather than wait for the instructor to foster new learning.
10. I often use materials I've found on my own to help me in a course.
11. For most of my classes, I really don't know why I complete the work I do.
12. I am very convinced I have the ability to take personal control of my learning.
13. I usually struggle in classes if the professor allows me to set my own timetable for work completion.
14. Most of the work I do in my courses is personally enjoyable or seems relevant to my reasons for attending college.
15. Even after a course is over, I continue to spend time learning about the topic.
16. The primary reason I complete course requirements is to obtain the grade that is expected of me.
17. I often collect additional information about interesting topics even after the course has ended.
18. The main reason I do the course activities is to avoid feeling guilty or getting a bad grade.
19. I am very successful at prioritizing my learning goals.
20. Most of the activities I complete for my college classes are NOT really personally useful or interesting.
21. I am really uncertain about my capacity to take primary responsibility for my learning.
22. I am unsure about my ability to independently find needed outside materials for my courses.
23. I always effectively organize my study time.
24. I don't have much confidence in my ability to independently carry out my study plans.
25. I always rely on the instructor to tell me what I need to do in the course to succeed.

Appendix C

Grit-S Scale (Duckworth & Quinn, 2009)

Each statement has the following choices:
___ Not like me at all
___ Not much like me
___ Somewhat like me
___ Mostly like me
___ Very much like me

1. New ideas and project sometimes distract me from previous ones.
2. Setbacks don't discourse me. I don't easily give up.
3. I often set a goal but later choose to pursue a different one.
4. I am a hard worker.
5. I have difficulty maintaining my focus on projects that take more than a few months to complete.
6. I finish whatever I begin.
7. I am diligent. I never give up.
8. I have been obsessed with a certain idea or project for a short time but later lost interest.

Appendix D

Stage in Doctoral Program

___ Doing coursework
___ Completed coursework, but have not begun comprehensive exams
___ Writing comprehensive exams
___ Defended comprehensive exams
___ Writing dissertation proposal
___ Defended dissertation proposal
___ Collecting data
___ Completed data collection and writing final dissertation chapters
___ Have written final chapters and dissertation defense date is/will be scheduled

Appendix E

Demographic Information Form

With what gender do you identify?
___ Female
___ Male
___ Non-binary/third gender

What is your age?

Please identify your enrollment status during your doctorate:
___ Part-time enrollment
___ Full-time enrollment

Do you work a full-time job?
___ Yes
___ No

Appendix F

Instrument Permissions

Permission to use PRO-SDLS

Ruttencutter, Gwen
Sat 11/18/2017 5:00 pm
To: sstockda@kennesaw.edu

Hello, Susan,

This is Gwen Ruttencutter, doc candidate in Adult Learning at UTK (and fellow student of Ralph's).

I am contacting you to ask your permission in using the PRO-SDLS for my dissertation study. With this study, I am examining SDL and grit among doc students in their progression toward degree. Given the context of the learners, the PRO-SDLS is the suitable instrument.

When you have a moment, I appreciate your letting me know if I may use your instrument for this study.

If you have any questions, please let me know.

Many thanks in advance, Susan, and Kind regards,
Gwen

Gwen Ruttencutter, Ph.D. Candidate, M.Ed.
Educational Psychology & Research (Adult Learning)
Graduate Research Assistant ~ Educational Psychology & Counseling Department
The University of Tennessee Knoxville

she/her/hers

From: Susan Stockdale <sstockda@kennesaw.edu>
Sent: Monday, January 1, 2018 9:45:29 PM
To: Ruttencutter, Gwen
Cc: Brockett, Ralph G
Subject: Re: Request to use PRO-SDLS for dissertation study

Hi,
We switched email systems from Zimba to Outlook last month and things are disappearing and reappearing or going to my draft file instead of sending. Anyway.....here you go. You also have my permission to more precisely define the learning experience you are

measuring.....e.g. college course might be better defined in this scale as college mathematics course.

Susan

Susan Stockdale, Ph.D.

Professor of Educational Psychology and Middle Grades Education

Program Director, Woodrow Wilson Teaching Fellowship

Former Associate Dean of Graduate Studies, Bagwell College of Education

Bagwell Education Building 451

Kennesaw State University

Kennesaw, GA 30144

Work: 470-578-2060 Cell: 678-491-1020

Permission to use Grit Scale

On Sat, Nov 18, 2017 at 5:11 PM, Gwen Ruttencutter <wordpress@angeladuckworth.com> wrote:
From: [your-name] <gruttenc@vols.utk.edu>

Subject: Other

Dr. Duckworth:

My name is Gwen Ruttencutter. As a PhD candidate at the University of Tennessee Knoxville, I am contacting you regarding my using the Grit-S scale for my dissertation research. I plan to examine grit and self-directed learning among doctoral students.

While I recognize your instrument is readily available, I prefer to have your consent before using your work for my study.

Sincerely,

Gwen Ruttencutter

gruttenc@vols.utk.edu

Re: AngelaDuckworth.Com: Other
Duckworth Team <info@angeladuckworth.com>
Mon 11/20/2017, 11:33 AMRuttencutter, Gwen
Dear Gwen,

Thanks for reaching out.

As detailed here, the Grit Scale is copyrighted and can only be used for education or research purposes. For example, PhD students and professors are welcome to use the Grit Scale in their projects. The Grit Scale cannot be used for any commercial purpose, nor can it be reproduced in any publication.

We also discourage using the Grit Scale to evaluate students or employees. As Angela discusses in this paper, this Q&A, and this op-ed, the scale is not appropriate for high-stakes assessment and, in addition, may not be the ideal instrument for evaluating programs (e.g., seeing whether a particular program increases grit).

Best,
Duckworth Team

Appendix G

IRB Approval Letter

February 12, 2018

Gwen Ruttencutter UTK - Coll of Education, Hlth, & Human - Educational Psychology & Counseling

Re: UTK IRB-18-04263-XM Study Title: Getting gritty with it: An examination of grit and self-directed learning among doctoral students

Dear Gwen Ruttencutter:

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.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.

Therefore, this letter constitutes full approval of your application (version 1.0)as submitted, including: Ruttencutter_Invitation to participate - Version 1.0 Ruttencutter_Stage in degree and Demographic items - Version 1.0

Grit instrument - Version 1.0

PROSDLS instrument - Version 1.0 The above listed documents have been dated and stamped IRB approved 2/12/2018.

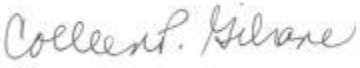
Informed consent may be altered in accord with 45CFR46.116(d), with a consent cover statement used in lieu of a consent interview. The requirement to secure a signed consent form is waived under 45CFR46.117(c)(2).

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.

Any alterations (revisions) in the protocol [including any of the above stamped approved documents] 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

Institutional Review Board | Office of Research & Engagement 1534 White Avenue Knoxville, TN 37996-1529 865-974-7697 865-974-7400 fax irb.utk.edu

Vita

Gwen Scott Ruttencutter was born in Peoria, Illinois, to William and Pamela Scott, and grew up primarily in Danville, Illinois. A poorly performing college student who could not make sense of college, Gwen flunked out of Illinois State University, remaining a college drop out for the next 20 years. In those intervening decades, she worked as a domestic violence counselor, as a project manager for international trade shows in the US and Europe, and as the director of public relations for Habitat for Humanity / Jimmy Carter Work Project 2003 in Valdosta, Georgia (where she met and fell in love with her husband, Will). As small business owners, Gwen and Will founded a social enterprise company that built affordable housing for low- to moderate-income homebuyers. They also founded a not-for-profit organization, where, on behalf of the State of Georgia and HUD, Gwen facilitated homebuyer education workshops and provided foreclosure intervention counseling to hundreds of adult learners. After the housing market crashed in 2008, Gwen put herself on unemployment and went back to school in May 2010.

At Valdosta State University, Gwen found the Adult & Career Education department and discovered that teaching adults is an *actual* field of study. After completing her undergraduate degree in Adult & Career Education in July 2011, she then completed a master's degree, also in Adult Education, in May 2013. With the encouragement of VSU faculty Drs. McClung and Mat Som, Gwen decided to pursue a doctorate in Adult Learning. During the School-a-Palooza II tour (AKA her search for a doctoral program), Gwen met Mary Ziegler, now associate professor emerita, in the Adult Learning program at the University of Tennessee Knoxville. Meeting Mary, Gwen felt she had found her place. Working with Ralph Brockett, Gwen knew she had chosen wisely.

In the past five years, in addition to her doctorate, Gwen has taught several psychology courses as adjunct faculty with Tusculum College, and has co-taught UTK graduate courses with Mary Ziegler.

Living *The Life of the Mind* the past five years has been an extreme privilege. She has found a scholarly world that finally makes sense, as well as friends and colleagues who are kind, interesting, clever, funny, and curious about the world. Marrying her husband was the best decision she ever made; doing here doctorate was the second best.