GROWING GRIT TO PRODUCE DOCTORAL PERSISTENCE

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ABSTRACT

Aim/Purpose	The purpose of this systematic grounded theory study was to generate a model explaining how grit and a growth mindset develop and influence persistence in doctoral completers. Since doctoral attrition has historically plagued institutions of higher learning, with conflicting explanations reported in the literature, program leaders will benefit by understanding factors associated with persistence.
Background	Although the initial literature regarding doctoral persistence relied on the more traditional student involvement and integration models of higher education, the changing landscape of doctoral education—a steep increase in the number of distance education programs, as well as students' time and energy constraints—calls for a closer look at individual student factors over engagement efforts.
Methodology	The systematic approach of grounded theory was adopted to fulfill the purpose of constructing a model explaining the process of grit and growth mindset development in doctoral students who persist to completion. Both quantitative data from a total population of 51 completers, in the form of the Short Grit Scale instrument and Dweck's Mindset Instrument, as well as qualitative data from interviews and reflective journals of a sample of 12 doctoral completers were analyzed to produce the Grit Growth Model suggested by the findings.
Contribution	The Grit Growth Model contributes empirical evidence of the antecedents of the characteristics of grit and growth mindset, which has been limited in the literature to date. A unique contribution of this study is the suggestion of a departure from the typical approach of leaders in post-graduate institutions from a

student-integration/engagement approach, to a more direct personal development strategy, with specific direction given by the Grit Growth Model, as well as the additional Student Development Model of Doctoral Persistence.

Findings	The findings produced the Grit Growth Model, which revealed sub-themes of expectations, engagement, service, and personal loss in the life experiences of the doctoral completers, as well as values surrounding religious faith and passion. Personal characteristics of flexibility and shame resilience were identified, and findings confirmed prior persistence literature that acknowledged the imminent value of personal and academic relationships. The central theme of personal and social responsibility (PSR) carries theoretical, empirical, and practical implications for doctoral or any other leaders who wish to develop grit in others, as well as individuals seeking to develop the trait within themselves.
Recommendations for Practitioners	Given the findings of this study, doctoral program leaders should make a concerted effort to add a direct student development focus to their portfolio of strategies to support student persistence, as visualized in the Student Development Model of Doctoral Persistence. Programmatic elements, such as direct provision of grit, growth mindset, and PSR resources through doctoral student communication platforms, could deliver persistence support by means of advancing student metacognition of these principles. Additionally, modules that introduce and inspire growth in these areas using the quantitative instruments for grit and a growth mindset, followed by reflective journaling, direct instruction videos, and post-tests, are suggested.
Recommendations for Researchers	Future researchers in any field can build upon this model by replacing doctoral persistence with their own long-term goals or achievements and representing their findings by adjusting the model accordingly. In this way, the significance of the Grit Growth Model lies in its adaptability to future inquiry, providing a meaningful template to illustrate confirmatory or alternative findings.
Impact on Society	For educators at any level or individuals who wish to develop grit and a growth mindset within themselves or others studying the array of categories of experiences and beliefs on the Grit Growth Model will illuminate multiple paths to follow on this quest. Accessing resources from Duckworth's Character Lab (https://characterlab.org/), Dweck's mindset works© website (https://www.mindsetworks.com/default), or the AAC&U's Personal and Social Responsibility site (https://www.aacu.org/core_commitments) are suggested concrete starting points.
Future Research	In subsequent research along these same lines, it would be desirable to solicit a follow-up interview to dig deeply into more nuanced life experiences that may not emerge in the initial interview. Additionally, due to the limitations of snowball sampling, future confirmatory research should focus on samples from a wider population who completed at a more diverse group of universities. Finally, although the interview sample size of 12 participants produced findings with theoretical saturation, a larger sample from a wider variety of disciplines and demographics, including unmarried doctoral completers, may paint a more complete picture of the common experiences and values of completers from a broader range of personal and professional backgrounds.
Keywords	grit, growth mindset, doctoral persistence, higher education, personal and social responsibility

INTRODUCTION

Character development in higher education has long been an integral facet of its mission:

> Liberal education should cultivate the practice of the moral alongside the intellectual virtues. College is about thinking, and the refinement and informing of the intellect is its first purpose. This requires in turn the education of the whole human being. Humans not only think, but they do. Their doing and thinking work together to form their characters. If their characters are not courageous, moderate, and just, then not only will they be craven in action, but their thinking will be impaired. (Arnn, 2019, p. 2)

Passion and persistence are noble qualities that fit into a larger landscape of character that guide one's actions. One leader of the past, a doctoral completer, Dr. Martin Luther King, Jr., inspired these qualities to invoke action to address such worthy and long-term societal causes as racial injustice: "We must keep moving. If you can't fly, run; if you can't run, walk; if you can't walk, crawl; but by all means keep moving" (King, 2005, p. 419). King (1992) also encouraged educators to directly influence the whole person through character training, promoting the importance of critical moral judgment: "Intelligence plus character—that is the goal of true education. ... If we are not careful, our colleges will produce a group of close-minded, unscientific, illogical propagandists, consumed with immoral acts" (p. 124).

With character development in mind, the question of how current leaders in higher education – specifically doctoral administrators – can produce the personal quality of persistence in their students emerges. Historically, student persistence in higher education has been attributed to assimilation into the academic and social structures of the institution (Tinto, 1975). However, doctoral students experience unique challenges compared to traditional undergraduate students, including navigating competing roles, as well as isolation and academic fatigue (Hwang et al., 2015; Pifer & Baker, 2016), resulting in attrition rates ranging from 40% to 70% (Ames et al., 2018). Although the initial literature regarding doctoral persistence relied on the more traditional student involvement and integration models of higher education (Astin, 1999; Tinto, 1993), which focused on increasing students' meaningful interactions with the institution, the changing landscape of doctoral education—a steep increase in the number of distance education (DE) programs, as well as students' time and energy constraints—calls for a closer look at individual student factors over engagement efforts. Over the last 20 years, researchers have scrutinized the complexity of factors affecting doctoral persistence, and many are now beginning to emphasize the essential role of individual characteristics of the student (Golde, 1994, 1998; Lovitts, 2005; Rigler et al., 2017; Spaulding & Rockinson-Szapkiw, 2012; Terrell et al., 2009).

More recently, a certain individual characteristic has received attention as it correlates to persistence (Datu et al., 2017; Hochanadel & Finamore, 2015). The trait of grit, defined by Duckworth (2016) as "the combination of passion and perseverance" (p. 8) to accomplish long-term goals, has emerged as a key factor in achievement of success across a wide variety of disciplines (Duckworth et al., 2007, 2011). Despite the extensive literature demonstrating a correlation between grit and achievement of long-term goals (Eskreis-Winkler et al., 2014), very little research has addressed *how* people develop the trait in the first place.

In the psychological arena, students of all ages have historically subscribed to one of two trains of thought: (a) I do (or do not) have what it takes to succeed, or (b) I can do anything I set my mind to (Dweck, 2016). One train reveals a fixed mindset, a self-theory ascribing to the belief that qualities are static. The other train reflects a growth mindset, which empowers the belief that qualities are malleable (Dweck, 2008). Abundant literature confirms the positive effects of a growth mindset on student success (Dweck, 2016; Haimovitz & Dweck, 2017; Zeng et al., 2016).

By introducing interventions that promote a growth mindset, researchers are discovering that students' mindsets can be changed (Rattan et al., 2015; Yeager et al., 2016). Emerging literature connecting the theories of grit and mindset has presented a convincing case for linking the two together to facilitate achievement of goals (Hochanadel & Finamore, 2015; McClendon et al., 2017; Wang et al., 2018; Yeager et al., 2016). If students possess both a growth mindset and a high level of grit, their chances of success are greatly improved (Duckworth et al., 2007; Fitzgerald & Laurian-Fitzgerald, 2016; Hogan, 2013).

Despite abundant inquiry surrounding persistence, meaningful practical solutions to doctoral attrition rates are limited in the literature (Brill et al., 2014; Mendoza et al., 2014; Sutton, 2014). If practitioners—armed with knowledge about how grit and a growth mindset develop—could design interventions that cultivate a growth mindset, as well as a higher level of grit in doctoral students, programs may begin to report higher doctoral completion rates. This study aimed to uncover the seeds that practitioners can sow to foster both grit and growth mindset development, and consequently, doctoral persistence.

CONCEPTUAL FRAMEWORK

Tinto's (1975) theory of social and academic integration recognized the critical need for college students to connect to the various social and academic components of an institution in order to persist to completion. Tinto's student integration model (SIM) served as a launching point for a plethora of research in academic persistence, emphasizing the value of interactions between individuals and their environment.

However, many researchers, such as Pifer and Baker (2016), described the unique nature of doctoral student experiences, noting typical challenges that are unrelated to social integration: "The task of balancing personal and familial roles and responsibilities during the doctoral journey presents challenges across the stages . . . [as] 43% of students who leave graduate programs do so for personal or family-related reasons" (p. 23). Factors that typically affect doctoral persistence—responsibilities and coping skills—relate to roles outside of *student* that add to the workload and how the student manages these competing demands. It is evident that many present-day doctoral students simply do not have the time to dedicate to involvement with the institution beyond the most basic academic requirements due to their other professional and personal commitments (Gardner & Gopaul, 2012; Morrison Straforini, 2015).

Indeed, fewer doctoral students of the modern era have time and space in their daily lives to devote to integration or engagement opportunities with the institution than students of the previous century, or even the previous decade (Putnam, 2000). Because of a variety of competing roles in doctoral students' experiences, reliance on traditional student persistence models is insufficient. Given the particularly unique nature of post-graduate education, the increasing role of distance or limited residential program formatting (Sutton, 2014), and heavy constraints on doctoral students' time and ability to integrate with the institution, the need to identify and examine specific individual student characteristics that affect completion rates and how institutions can proactively develop those traits is especially apparent.

A distinction of grit theory, particularly for the current study, is its implications for the accomplishment of long-term academic goals. However, no research has examined the relationship between grit and doctoral persistence. Pursuing any type of college degree requires continuous commitment over the course of several years. Since doctoral completion can take anywhere from three to over 10 years (National Science Foundation [NSF], 2009), it uniquely qualifies as a long-term goal worthy of inspection through the lens of grit theory.

As the value of the characteristic of grit in personal achievement has become more evident, the question of how it develops in individuals has also become more prevalent. By identifying "some insight into the antecedents of grit" (Raphiphatthana et al., 2018, p. 76), educational leaders at all levels can

promote the growth of grit in students through purposeful mechanisms. Additionally, a growing body of literature convincingly suggests a critical link between a growth mindset and grit (Fitzgerald & Laurian-Fitzgerald, 2016; McClendon et al., 2017; Pueschel & Tucker, 2018). By instituting interventions which cultivate both a growth mindset and grit, practitioners are finding that undergraduate students "persist in the face of academic challenges" (Hochanadel & Finamore, 2015, p. 49) more than those who do not receive interventions.

Dweck (2016) explored the notion that "your basic qualities are things you can cultivate through your efforts, your strategies, and help from others" (p. 7). A growth mindset, which interprets challenges and failures as paths to future success, can propel people toward achievement of endless pursuits. Educators who wish to develop a growth mindset in their students must facilitate a focus on valuing the process and on embracing challenges—students must be guided to not be defeated in the *now*, but to hope for the *yet*. The guiding principal in using the theory of mindset in education involves teaching students to "react to challenges with excitement, rather than fear" (Davis, 2017, p. 11). Dweck (2016) and colleagues have inspired practitioners at all educational levels to apply the theory not only to students, but also to teachers.

Because Dweck's (2016) research has not been limited to intelligence, but also applies to any quality or personal characteristic one desires to grow, her theory is important to the premise of this study, which surmises that growing the trait of grit is possible. Even if a person does not naturally display the passion and perseverance necessary to complete a long-term goal—such as doctoral study—the theory of mindset establishes the precept that a person's level of grit is not fixed. Grit can be cultivated purposefully. Building on this theory, educators are beginning to take practical steps to intervene in struggling undergraduate students' college experiences in order to promote success through the development of a growth mindset, as well as a higher level of grit (Fitzgerald & Laurian-Fitzgerald, 2016; Yeager et al., 2016). Applying mindset theory to doctoral students as they begin their program could have important theoretical implications to support the power of mindset, as well as meaningful and practical implications for doctoral persistence.

In the conceptual model guiding this study (Figure 1), Tinto's (1975) seminal student integration theory links the two components of institutional factors (Ames et al., 2018; Lovitts, 2001) and individual factors found to drive doctoral persistence (Rockinson-Szapkiw et al., 2014; Santicola, 2013). The two individual factors that correlate to achievement of educational goals (Duckworth, 2016; Dweck, 2016), grit and a growth mindset, are depicted by the inverted triangles. Not yet established empirically, the experiences or beliefs, which develop these individual characteristics, are represented by question marks. The present study begins the process of resolving some of those question marks. On the institutional side of the equation, efforts to support student persistence, such as engaging students more effectively with activities or groups at the institution (Rigg et al., 2013) and providing access to resources (Santicola, 2013), aim to satisfy Tinto's (1975) traditional model of integration. Institutions have also implemented direct support measures, such as mentoring programs and close supervision (Gardner, 2008).

Findings from this study provide implications for an atypical approach to increasing student persistence, such as by offering direct student development interventions that grow doctoral students' personal characteristics of grit and a growth mindset (Duckworth, 2016; Dweck, 2008), apart from program initiatives aimed at social and academic integration, or other direct support mechanisms. Currently, there is no model that illustrates the process of how grit and a growth mindset develop, nor how these characteristics relate to doctoral persistence. Reading Figure 1 from bottom to top one can visualize how direct student developmental interventions, which have not yet been defined, will yield grit and growth mindset in the doctoral students. The exact connection between grit and growth mindset is under study here, but these are the individual factors that together with institutional factors/supports and social/academic integration may actualize doctoral persistence – the star within doctoral students' grasp.
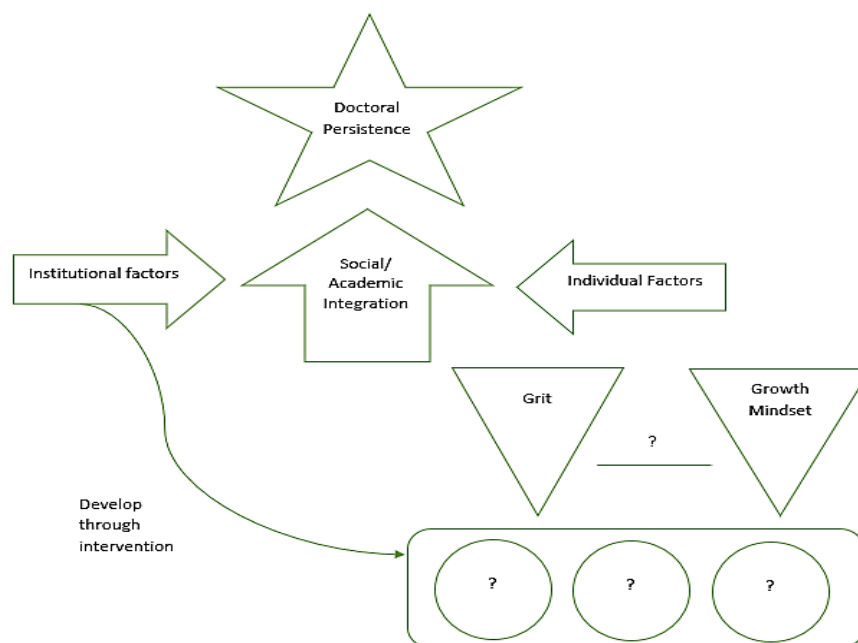
Figure 1. Conceptual Framework Visual Representation (Hudson, 2020)

LITERATURE REVIEW

Doctoral study, like other rigorous endeavors, requires a degree of personal sacrifice and commitment that many students are unable to maintain—leading to surprisingly low completion rates (Ames et al., 2018). Unlike any other academic pursuit, the quest for an advanced degree demands so high a level of persistence—an ability to push past *I don't want to* and *I can't* day after day, year after year—that about half of the students who begin programs of study cannot sustain them (Gardner & Gopaul, 2012). Successful graduate schools present themselves as "highly desirable places to be and maintain this elitism by offering selective admission and membership to 'the Best.' The selectivity allows the system . . . to make great demands on students . . . in terms of commitment, loyalty, time, and energy" (Lovitts, 2001, p. 259). Despite comprehensive vetting policies and strict admissions requirements, doctoral attrition rates outpace undergraduate early departure rates (Gardner, 2008; Golde, 2005). As doctoral program leaders seek to prevent early departure, new information that uncovers specific components of doctoral completers' formula for successful persistence enables administrators to address individual needs or deficits through program design.

Many of the current practices that aim to buoy doctoral persistence stem from previous research that called for increasing students' level of academic and social integration into the institution (Golde, 2005; Santicola, 2013) or appealed to institutions to increase efforts toward student support (Lovitts, 2001). Many practical efforts toward reducing doctoral attrition have centered on social and academic engagement strategies, such as building community through cohorts, designing online connection platforms, or establishing a doctoral student support center (Ames et al., 2018; Terrell et al., 2009; West et al., 2011). From Tinto's (1975) model of student integration, program leaders recognize that "involvement matters. The more academically and socially involved individuals are—that is, the more they interact with other students and faculty—the more likely they are to persist" (Tinto, 1998, p. 168). In order to promote increased connectedness and student satisfaction, Rockinson-Szapkiw (2011) recommended the "adoption of a collaborative workspace" (p. 1166) by means of an online portal for distance doctoral students during the dissertation process.

Following the advice of Lovitts (2001) and taking responsibility for the institutional side of the equation, doctoral administrators have also initiated a variety of measures to directly support student

completion. Breitenbach (2019) found that implementing the Ewing Model, in which "students complete their culminating project with a cohort of other students" (p. 222), was an "effective strategy for providing the social connectedness and structure that may help ensure that students complete their doctoral program" (p. 228). Other programs implemented a more supportive writing development program, led by a doctoral support team (Sutton, 2014). These efforts represent a sample of the attempts made by institutions to offer direct interventions toward completion.

Because a large percentage of present-day doctoral students are working professionals who attend school part-time, the time-to-degree completion can take up to ten years (Wao & Onwuegbuzie, 2011). The sheer length of time can act as a draining force on students' marriages, relationships, and resources (Morrison Straforini, 2015). Emotional exhaustion, leading to burnout, can set in after prolonged school commitments continue to be stacked on top of the other depleting demands of life (Rigg et al., 2013). Attending part-time can also cause schoolwork to be relegated to minor-priority status, leading to low performance and discouragement (Hwang et al., 2015). Working professionals who attend school part-time may also find the extra demands that distance-education programs place on students—even sincere attempts at student engagement or community-building—burdensome and unhelpful (Gardner & Gopaul, 2012). Although isolation is a common theme in persistence literature (West et al., 2011), program leaders may need to rethink their integration attempts and incorporate more direct support measures that do not add unnecessary obligations to the students.

Very few practitioners have ventured to directly develop personal characteristics, such as grit and a growth mindset, within their students after matriculation in order to equip them to persist successfully. These characteristics have been demonstrated to boost academic performance in students at all other levels of education (Dweck et al., 2014; Lucas et al., 2015; Rogalski, 2018), but they have been explored very little at the post-graduate stage. Since many doctoral students do not have the time and space in their lives to devote to engagement opportunities with their institutions, faculty and administrators must shift their efforts from simply attempting to satisfy the integration models of persistence (Astin, 1999; Tinto, 1993) toward a model that emphasizes the importance of student characteristics. The results of this present study produced the Grit Growth Model (Hudson, 2020) which highlights two notable individual characteristics found to correlate with academic achievement (Duckworth, 2016; Dweck, 2016). Leaders of post-graduate programs must recognize the need to support the development of grit, a growth mindset, and other individual characteristics which will enable students to persist despite the many challenges of the contemporary doctoral journey (Rockinson-Szapkiw & Spaulding, 2014).

As more researchers examine the ramifications of grit theory in a practical sense, more knowledge is needed to identify the common threads that weave grit into a person's personality. A growing body of research is emerging which connects grit with a growth mindset, confirming the premise that grit is not static and can be developed within students through outside interventions (Fitzgerald & Laurian-Fitzgerald, 2016; Yeager et al., 2016). Of special interest are intrinsic and extrinsic variables and what factors interact to produce grit.

Several potential mechanisms support grit growth from an internal standpoint. A person's natural interests and passions usually guide them toward goals that they are willing to work harder and longer toward achieving (Duckworth, 2016). Additionally, consistent, intentional practice toward reaching the goal functions as a catalyst for creating even more drive and motivation to persist, such as in the case of the National Spelling Bee finalists and musicians who exhibited high levels of grit (Duckworth et al., 2011; Miksza & Tan, 2015). Finally, an innate sense of a larger purpose or calling enhances a person's degree of effort significantly toward achieving a long-term goal, especially if the goal benefits others (Hill et al., 2016; Von Culin et al., 2014). Duckworth (2016) explained, "most gritty people see their ultimate aims as deeply connected to the world beyond themselves" (p. 148). Practitioners can help students identify their own natural interests, guide them to formulate a plan to develop goals from those interests, and inspire within students a vision for using the achievement of those goals to serve a higher purpose.

As practitioners seek pathways to produce a higher level of grit in students using external measures, Duckworth (2016) noted that her research uncovered themes of authoritative parenting (management) style, intentional stretching exercises, and an overall culture of grit, all contributing to building the trait from without. In looking at a smaller target population—doctoral completers—this study digs deeper to add to the fledgling body of knowledge of grit development that is associated with the accomplishment of long-term goals. As doctoral program leaders better understand these themes, they can use the knowledge to incorporate them into program design, structure, and overall culture. Since the theories of grit and mindset are already well established, the unique goal of this study was to produce a model illustrating how these two constructs interact to aid in doctoral persistence.

METHODS

The systematic approach of grounded theory (Corbin & Strauss, 2015) was adopted to fulfill the purpose of constructing a model explaining the process of grit and growth mindset development in doctoral students who persist to completion. Corbin and Strauss (2015) defined grounded theory as a "qualitative methodology that aims at constructing a theory from data" (p. 15). Since this study gathered data for the purpose of generating theory about the relationship between grit, a growth mindset, and doctoral persistence—as well as theory regarding what experiences and beliefs in a person's life produce grit—this design was the optimal choice. Constant comparison, "the act of taking one piece of datum and examining it against another piece of datum both within and between documents" (Corbin & Strauss, 2015, p. 93), was used throughout the analysis process as new interpretations led to careful comparisons in search of concepts that could be linked or differentiated. The systematic approach of grounded theory was followed to fulfill the purpose of constructing a model explaining the process of grit and growth mindset development in doctoral students who persist to completion.

PARTICIPANTS

Upon approval from the Institutional Review Board (IRB), purposeful, convenience, and snowball sampling methods were employed to locate a theoretical sample of participants who fit the selection criteria of the study (Creswell, 2014). For the purpose of this study doctoral persistence was operationalized as doctoral completion. We initially recruited doctoral completers (within the last five years) through the American Educational Research Association (AERA) sending out a recruitment letter to six special interest groups (SIGs) within the professional association. Participants were also recruited through convenience and snowball sampling of personal and professional contacts, as well as through social media. Survey respondents completed an online demographic questionnaire followed by Duckworth and Quinn's (2009) Short Grit Scale and Dweck's Mindset Instrument (De Castella & Byrne, 2015). Survey respondents were invited to submit their email address if willing to participate in the qualitative study. From the pool of survey respondents ($N = 51$) who provided consent to participate in the next stage of the study, we analyzed demographic information to identify a purposeful selection of individuals who represented maximum variation regarding age, ethnicity, gender, socioeconomic background, degree, and program type (Corbin & Strauss, 2015). Table 1 illustrates the demographic profile of the final sample ($N = 12$) for the study – 5 males and 7 females. Pseudonyms were assigned to communicate each participant's grit and mindset scores (see notes in Table 1).

Table 1. Participant Demographics (*N = 12*)

Participant Pseudonym	Age Range	Race	Sex	Marital Status	Religion	Type of Degree	Discipline	Type of Program
Holly G.	30s	AA	F	Married	Christian	EdD	Higher Ed.	Residential
Hannah G.	30s	W	F	Married	Judaism	PhD	Ed. Psych.	Residential
Helen F.	40s	W	F	Married	Christian	EdD	Nursing Ed.	D.E.
Hester G.	50s	AA	F	Married	Jehov. Wit.	PhD	Psychology	D.E.
Harrison G.	40s	W	M	Married	Christian	EdD	Ed. Leader	D.E.
Harry	30s	W	M	Married	Non-religious	PhD	Clinical Psyc.	Residential
Heidi G.	30s	W	F	Married	Non-religious	PhD	Literature	Residential
Henry G.	30s	W	M	Married	Christian	EdD	Higher Ed.	D.E.
Hayden G.	40s	W	M	Married	Christian	EdD	Curr. & Instr.	D.E.
Hazel F.	70+	W	F	Married	Christian	EdD	Curr. & Instr.	D.E.
Heather G.	50s	W	F	Married	Christian	DNP	Nursing	D.E.
Hezekiah G.	30s	W	M	Married	Christian	PhD	Higher Ed.	D.E.

Notes. AA = African-American, W = White, F = Female, M = Male, D.E. = Distance Education
Participant's first initial indicates "High" (H) or "Low" (L) grit score; Last initial indicates "Growth" (G.) mindset, "Fixed" (F.) mindset, or neither (no initial).

DATA SOURCES

Demographic data (see Table 1) and quantitative data using the Short Grit Scale (Duckworth & Quinn, 2009) and Dweck's Mindset Instrument (De Castella & Byrne, 2015) were collected via online survey (see Table 2). Following analysis of the quantitative data, individual interviews were conducted. Although this study was qualitative, the use of valid and reliable instruments to determine what level of grit and what type of mindset the participants demonstrated was integral to the analysis and triangulation of data sources from participants. Patton (2015) explained that sometimes "triangulation within a qualitative inquiry strategy can be attained . . . by combining qualitative and quantitative methods" (p. 317). This does not imply that this study engaged in a formal mixed-methods approach, but merely that the quantitative data informed the deeper, qualitative analysis. No correlations or empirical causality were drawn from the numerical data.

Short Grit Scale

The Short Grit Scale (Grit-S; Duckworth & Quinn, 2009) has demonstrated "predictive validity, consensual validity, and test-retest stability" (p. 172) as the most economical measure of the trait of grit. The scoring ranged from a possibility of 1 (*not at all gritty*) to a possibility of 5 (*extremely gritty*). Duckworth and Yeager (2015) acknowledged the limitations of self-reporting instruments in accurately measuring personal qualities, but given that doctoral completers have demonstrated their own grit with the achievement of such a goal and that "self-report questionnaires are arguably better suited than any other measure for assessing internal" (p. 240) qualities, the instrument was considered valid. The Short Grit Scale has two subscales: (a) long-term interest, and (b) perseverance. Together these subscales produce the overall composite grit score (see Table 2).

Table 2. Survey Instrument Scores

Participant Pseudonym	Long-term Interest	Perseverance	Grit Score	Intelligence	Personality	Mindset Score
Holly G.	3.25	4.25	3.75	3.25	4.00	3.63
Hannah G.	4.00	4.50	4.25	4.00	3.75	3.88
Helen F.	3.75	5.00	4.38	3.00	2.00	2.50
Hester G.	3.75	5.00	4.38	4.50	3.25	3.88
Harrison G.	4.00	5.00	4.50	3.50	3.00	3.25
Harry	4.00	4.25	4.13	2.00	4.00	3.00
Heidi G.	3.75	4.25	4.00	4.00	3.50	3.75
Henry G.	4.00	3.50	3.75	4.00	4.00	4.00
Hayden F.	3.75	3.75	3.75	5.00	5.00	5.00
Hazel F.	4.50	5.00	4.75	2.25	3.50	2.88
Heather G.	4.25	5.00	4.63	2.50	5.00	3.75
Hezekiah G.	3.50	5.00	4.25	5.00	2.00	3.50
Mean	3.88	4.54	4.21	3.58	3.58	3.58

Mindset instrument

Data were also collected using a revised form of Dweck's Mindset Instrument (De Castella & Byrne, 2015), which only changed Dweck's (1999) original instrument by making items reflect a first-person perspective (using *I* statements). Although the mindset instrument typically uses a 6-point Likert scale, there was precedent for using a standard 5-point scale (Orvidas et al., 2018; Spinath et al., 2003). In personal communication (May 3, 2019), Dweck explained that she normally uses the 6-point scale because it "requires participants to make a decision—a midpoint allows people to not decide which they believe." However, since our purposes were qualitative and the instrument served as a means to examine growth mindset level in relation to grit level, we chose a 5-point Likert to align with the Short Grit Scale instrument for easier cross comparison of scores. The Mindset Instrument produces a composite mindset score derived from two subscales: (a) intelligence and (b) personality (see Table 2).

Interview guide

Because the interviews covered the lifespan of the participants, a happy medium between an unstructured, conversational approach and a standardized, semi-structured approach was the best interview method for this study. Using an interview guide helped "ensure that the same basic lines of inquiry are pursued with each person" and that "the interviewer . . . carefully decided how best to use the limited time available" (Patton, 2015, p. 439). Audio recordings of interviews were transcribed by an online automated transcription service for analysis, reviewed for accuracy, and submitted for member checking to confirm complete and accurate data (Patton, 2015). The interview guide (see the Appendix) served as a means of probing into the background and beliefs of the participants, leaving room to deviate from the script as constant comparisons began to produce categories which warranted further examination (Corbin & Strauss, 2015). The interview guide was constructed based on a thematic review of the literature on grit, growth mindset, and doctoral persistence. Prior to implementation, the interview guide was peer reviewed by faculty with expertise in the subject area.

DATA ANALYSIS

Quantitative data (see Table 2) were used as a means of categorizing participants as either higher grit or lower grit (first initial) and growth, fixed, or neither mindset (last initial). All qualitative data was transcribed and analyzed according to Corbin and Strauss's (2015) model for systematic grounded

theory. We engaged in constant comparisons, alternating between data collection and data analysis, making changes to the interpretations as better understanding was reached. Both informal data analysis methods, such as memoing and classifying participants, and formal methods, such as open, axial, and selective coding, were implemented. We continued to conduct theoretical sampling, adding participants until we reached theoretical saturation of the data, realized when no new codes or concepts were identified with the inclusion of additional participants. As a final step, we integrated the findings into a central core category, visualizing the other concepts in relationship to that core category, and formulated a theory about the relationship between grit, a growth mindset, and doctoral persistence.

FINDINGS AND THEORETICAL MODEL

The central research question, *"How do grit and a growth mindset develop and influence doctoral persistence?"* was divided into underlying sub-questions, which explored the participants' life experiences, as well as their values and beliefs. The following sections detail the findings derived from analysis of the data produced by the participants within each sub-category during the interview, reflective journal, and follow-up question portions of the study. The participants were first asked to broadly share the highlights of their growing up and adult years—high and low points—as well as general questions about their experiences and values. Once initial themes emerged, follow-up questions focused on the finer details of those experiences and values. The participants shared a wide variety of life experiences that may explain the development of long-term passion and perseverance, revealing themes of *engagement*, *expectations*, *loss*, and *service*. They also shared their broad and specific values and beliefs, some dating back to childhood, disclosing themes of *passion* and religious *faith* as common threads within these beliefs and values. Additionally, two unexpected themes emerged, in the form of other personal characteristics that may interact with grit and a growth mindset to impact doctoral persistence – *shame resilience* and *flexibility*. The synergy of the participants' common life experiences and values produced an overwhelming sense of *personal and social responsibility,* which emerged as the central finding of this study.

These results produced a dynamic theoretical model, the Grit Growth Model (see Figure 2), which depicts how grit and growth mindset develop and influence doctoral persistence. Corbin and Strauss (2015) emphasize the importance of creating an understandable and relatable model: "The most carefully crafted theory is likely to lose its impact if it is not put into a form that makes it readily available to other professionals and perhaps lay persons" (p. 311). Member checking, peer review, and expert review provided confirmability that the Grit Growth Model meets both criteria, as it is both believable and can be aptly used to support grit growth in doctoral students by program leaders, as well as generalized to a wider audience.

Visual metaphors can "support remembrance, lead to a-ha effects, support reasoning, and communication. They are instant and rapid, highly instructive, and facilitate learning" (Burkhard, 2005, p. 237). Since images can effectively transfer knowledge while expressing emotion and representing reality, we chose to illustrate the Grit Growth Model (see Figure 2) with the image of a grapevine (our doctoral completers) whose foundation (trunk) represents our central theme of personal and social responsibility. The doctoral completers in this study are firmly rooted in their life experiences: expectations, engagement, service, and loss; they are also guided and nourished by their values and beliefs: faith and passion. The doctoral completers' personal character traits of grit, growth mindset, and flexibility provide the primary support needed to produce the fruit of doctoral persistence. The Grit Growth Model is artistic and complex, yet, our study clearly demonstrates how these components work together to illustrate a simple scene of a healthy grapevine, its surroundings, and its development. These elements and additional aspects of the Grit Growth Model are discussed in detail below.
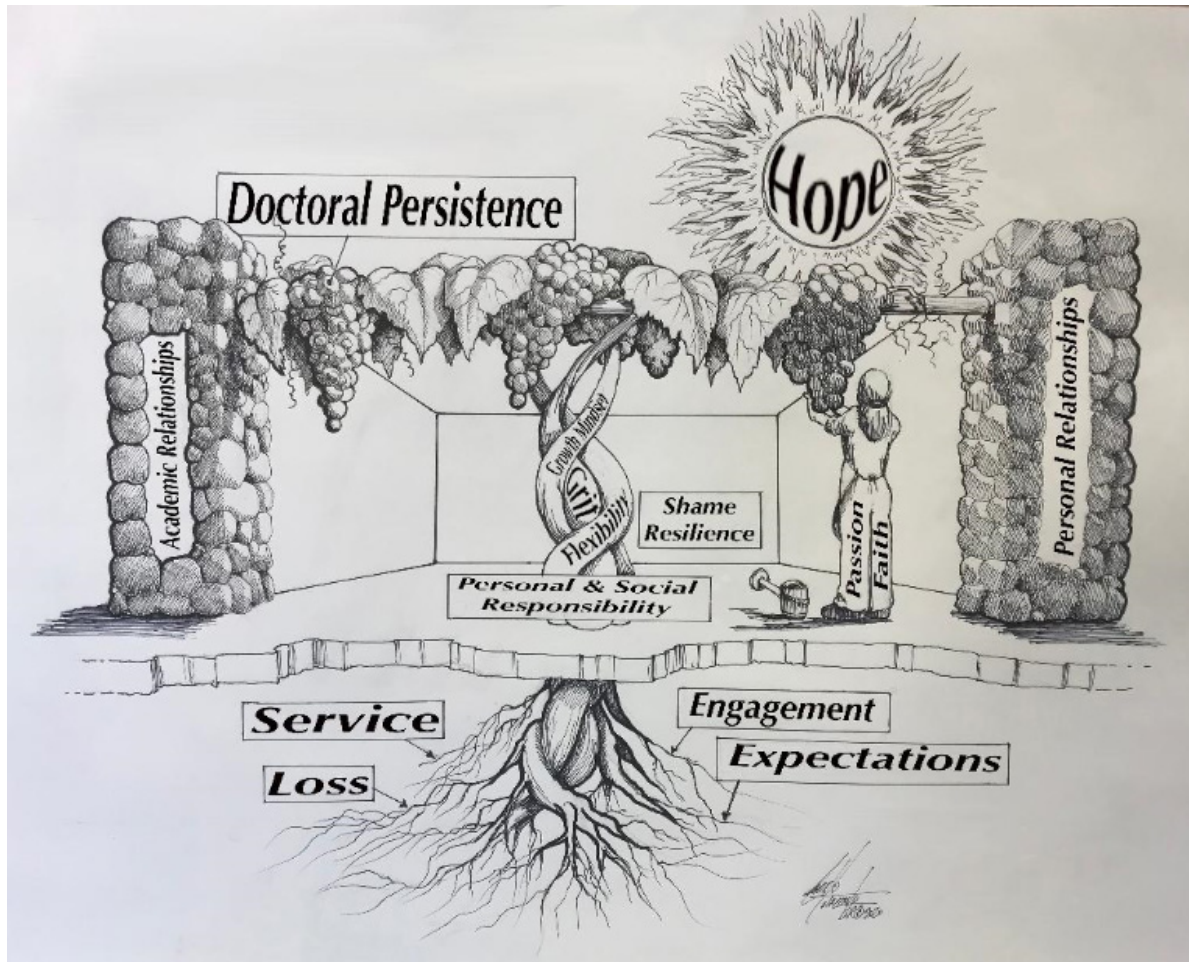
Figure 2. Grit Growth Model (Hudson, 2020)
Notes. Design by Melanie D. M. Hudson; Artwork by Arnulfo Jacinto.

GRAPEVINE – DOCTORAL COMPLETERS

The grapevine plant in the model represents the individual who completes a doctoral degree. The Grit Growth Model depicts a person as a grapevine comprised of separate components, or vines, which represent personal characteristics. The fruit borne by the individual shown in the model, ripe grapes, depicts persistence to doctoral completion. As part of a complex system, the grapevine flourishes as a result of dynamic interactions between a variety of factors. In order to produce healthy fruit, the grapevine must be established in a conducive environment, draw nourishment from a well-watered root system, and develop and grow hardy components (Winkler, 1974). Additionally, the grapevine must be trained and pruned in the right direction, lean on dependable support structures, and abide in a habitat protected from pests (Winkler, 1974). For doctoral completers, this study revealed those factors, which are represented by the components of the vine and vineyard discussed in the following sections. Grapevines are considered generally tenacious plants that tend to generate wide-spreading root systems and demonstrate persistent growth when conditions are favorable (Winkler, 1974), similar to a doctoral completer.

SUN – THE PRESENCE OF HOPE

For a grapevine to bear good fruit, growers must take care to ensure that the environment is favorable, especially regarding temperature and other climate-related conditions (Winkler, 1974). An otherwise hardy plant, in the wrong conditions, will not yield the desired fruit. Similarly, for a person to successfully complete a doctoral degree, an atmosphere of *hope* is key in providing the necessary stamina to supply the needed effort (Duckworth, 2016). Heidi G. subscribes to a hope that is rooted in her own efforts, that "*if you show that you are working in good faith and you're continuing to do things, that you will be rewarded eventually*," whereas Henry G.'s hope lies within his trust in a higher power: "*We may not be in control of all the details of our lives, but we trust that [God] works on our behalf*." Therefore, the sun was selected in the Grit Growth Model to represent the important presence of *hope* in the doctoral completer's journey.

VINES – PERSONAL CHARACTERISTICS

Grapevine plants produce individual vines (arms) that are designated in the Grit Growth Model as representing personal characteristics of the individual. In the model, the characteristics of *grit* and a *growth mindset* are illustrated as intertwining, since the quantitative and qualitative findings indicated that these characteristics are both present in the majority of the participants in the study, suggesting a probable inherent connection (Fitzgerald & Laurian-Fitzgerald, 2016). Many of the participants expressed views similar to Hayden G.'s:

> I believe grit is a toughness or a person with the will to succeed. It is a want-to attitude and doing something about it. I think it is something that has to do with your desire, and it can be developed if you are around like-minded people. I think athletes have growth mindsets. They are able to talk themselves into being successful even if they have failed. I think that with all those coming together a person can achieve success. A person has to want it and be able to go after it!

Furthermore, the qualitative results of this study revealed a potential correlation of a third personal characteristic, *flexibility*, depicted also as a separate vine. Harry articulated this best:

> I know lots of people who have a lot of grit. These people tend to be those who are most flexible with changing circumstances. These folks certainly have disappointments and setbacks but rarely seem to be overwhelmed or stalled in moving toward things they value and find meaningful.

ROOTS – LIFE EXPERIENCES THAT DEVELOP GRIT

The roots of the grapevine signify life experiences that develop grit in doctoral completers. The common categories of *expectations, engagement, service,* and *loss* that emerged as life experiences that develop grit are represented by the root system of the grapevine in the Grit Growth Model.

Most of the participants were subjected to certain *expectations* of others during their lives to either expend satisfactory effort academically or otherwise fulfill intentional obligations or character standards. Hester G., whose background as a child included living in a housing project, recalled the academic expectations she experienced:

> Learning was important in my community. ... It was just go out, graduate and try to live a very productive life . . . and I tell people my mom was not the parent who worried about us finishing school, whereas some parents struggled . . .[but my] mom said that was kind of just expected of us.

For Hannah G., the idea of contributing was communicated in terms of community service, as she knew she was expected to answer a call of duty to serve: "*The idea of giving back and . . .[not] for the personal attention, but you have a duty to serve your society. ... My parents both really believe that you need to be spending your time contributing.*"

Additionally, most participants experienced committed *engagement* in some sort of extracurricular activities and/or a wide variety of life experiences beyond daily living, such as travel or relocating. *Engagement* occurred during childhood, as in the case of Harry who grew up in a lifestyle of travel with the Department of Defense, which introduced opportunities to meet and integrate with many new people frequently, but also to then lose contact with them and start all over again:

> *Those experiences were really meaningful to me, and I really enjoyed them . . .yet they were also kind of challenging because . . .you make close friends and you meet people and you develop relationships . . .and then you move. … [W]e grew up on military bases . . .you would be moving every three, four or five years, but then everyone else would be moving . . .and it was never on the same cycle . . .that was kinda tough.*

Engagement was also evident in the participants' adult lives, as in the case of West Point Military Academy graduate Harrison G., whose commitment to taking a leadership role in high school and college sports, and then transitioning to embracing leadership opportunities in the military, professionally, and through service organizations as an adult, remained central to his character: "*I have served at [my church] for many years, serve currently now as a certified pastor and a deacon in the church . . .have served in college ministries . . .adult ministries . . . service is part of . . . my DNA.*"

All of the participants are also currently devoting their professional energies toward *service*-oriented disciplines, such as education or nursing, indicating a desire to contribute to the betterment of society above obtaining individual financial gain. Holly G. expressed:

> *I feel a responsibility to the education community. … Typically we are ranked between 48-50th in the nation in terms of health outcomes and education outcomes. I feel that the work I am doing is important in changing the outcomes of [my state's] citizens for the better.*

Furthermore, the participants hail from families that either served in the military or in ministry, or both. Helen F. recalled her early years when her father was a pastor:

> *I was probably in the lower socioeconomic life. I know there was a few years at a time when dad didn't receive a paycheck from the church at all because it was a small church. . .[but] I don't ever remember feeling poor.*

Finally, a large percentage of the participants gave an account of experiencing personal *loss*, either as a child or an adult. Hezekiah G.'s whole life has been marked by the sickness and passing of his younger brother, who died at age 12:

> *I would say [my life] was really difficult, especially earlier in life before the age of 13, because I had a brother who had severe cerebral palsy. He was about a year younger than me and lived to be 12 years old and he only ever weighed 40 pounds at his most, so it was severe. … my dad worked a second or third shift, so I'd get home from school and he would go to work every single night. It was a little difficult then.*

Represented as individual roots, these categories of life experiences seem to all coalesce to develop into the trunk of the grapevine, the central theme.

TRUNK — CORE CATEGORY OF PERSONAL AND SOCIAL RESPONSIBILITY

Very early in the memoing process, we began to recognize a central theme emanating from the data. In the beginning, we termed the theme, *Facing it*. The interview participants seemed to be characterized by a determination to confront difficulties head on, taking complete responsibility for doing so. We wrote:

> *FACING IT: Holly G. said that what she passes on to others is, "You're OK. And you have everything you need to be ok." We have reflected on this statement frequently throughout the last month. Holly G. believes that there is something internal that people can lay hold of which causes them . . .to persist through hardship. We recently heard the world's premier clinical psychologist and best-selling author, Dr. Jordan B. Peterson . . . [talk] about how people face life's challenges and he said, "You have an unavoidable mortal burden to bear in life. There's no escape from it, except to directly confront it and to take it on voluntarily and what's so fascinating about that—two things—one is psychotherapists of every stripe understand that*

> *this is one of the primary reasons that psychotherapy works. There is no dispute about that among all of the different psychotherapeutic schools—is that the confrontation of existential problems—voluntary confronta- tion—is curative . . .and the practical aspect of that is quite straightforward . . .it also indicates to you that there is far more to you than you think because it turns out that you have substantial problems—genuine, deep problems of malevolence and suffering, but that if you decide that you will take that on as your* **responsibility** *[emphasis added], that you can put yourself together psychologically . . .then you can actually solve the problems".* (Peterson, 2019)

As we examined the data and the literature, making constant comparisons between both the explicit and implicit messages of the participants and various self-regulatory concepts already being studied, we discovered a domain of learning which the American Association of Colleges and Universities (AAC&U) has labeled *Personal and Social Responsibility* (PSR) and identified as an essential learning out- come of a liberal arts education (2010). Since all of the participants expressed through both words and reported actions an overwhelming level of personal responsibility toward self, others, and society in general, this domain of learning became the central category.

The categories that emerged from the life experiences, as well as the values and beliefs of the partici- pants, all synthesize into this single core category of *personal and social responsibility* (PSR)(AAC&U, 2010)*,* represented by the trunk of the vine. Each participant demonstrated a resolute commitment to accomplishing the goal (the doctoral degree) by whatever means necessary. Hazel F. articulated the running theme that emerged of *no one can get this degree for me but me* when she shared, "*Everyone needs and accepts help when it is needed. However, you are totally responsible for achieving the doctoral degree. No one can do your thinking for you.*" Additionally, manifest in all participants' lives is strong evidence of a sense of duty to serving the larger good in society. Helen F. shared, "*what I do when I research should be beneficial to the community of professionals, uphold ethical integrity, and be representative of how I can positively impact others.*" This sense of *personal and social responsibility* stems from the expectations, experiences, and individual value systems of each person and leads to the development of personal characteristics needed to achieve the goal of doctoral completion.

VINEDRESSER – VALUES AND BELIEFS THAT DEVELOP GRIT

The vinedresser in the model does not symbolize a person, but rather represents those values and be- liefs that act as molding or guiding forces in the person's life. These forces interact directly with the vine, indicated by the tool in the vinedresser's hand, and also with the roots, illustrated by the nearby watering can. The common categories emerging from the findings suggest that religious *faith* and/or personal *passion* for learning or a specific field comprehensively influence the direction and experi- ences of the participants' lives. These internal forces not only shape the person directly, but they en- hance and nourish the experiences as well.

Many participants grew up in homes of faith, but some, like Heather G., found faith on her own as an adult: "*God's always been the center of it. [My husband and I have] been very strong believers working in the church.*" Other participants like Hannah G., found personal meaning and purpose through their pas- sions:

> *I just love learning. Pursuing a doctorate felt like the ultimate privilege. It wasn't like I went into it like, "Oh, here's my job." I was like, "Great! Five years in school. Awesome!" I truly love school and then I fin- ished my PhD and I'm thinking, "Should I go back and do another one?"*

The participants' passions and religious faith acted as catalysts in their lives to the pursuit of goals that have higher purpose and deeper meaning.

PILLARS – RELATIONSHIPS

The findings of this study pointed to the preeminent value of *personal* and *academic relationships* to persistence efforts (Tinto, 1975). Depicted as the framework for the support of the grapevine, these relationships interact with the person's ability to grow and the fruit to ripen. Although a vital element of the process of grit development and persistence, these relationships themselves do not function as experiences or values. Participants in this study *intentionally* identified the critical role that these relationships played in their lives and took *personal responsibility* for leaning into that support as needed. Harry aptly voiced this idea:

> There are certainly times to ask for help, but even that's ownership, right? To ask for help or to request help is still ownership of the task. ... I think that that's not inconsistent with personal responsibility. Even to seek help and to seek guidance is still a demonstration of, and a reflection of personal responsibility.

FENCE – SHAME RESILIENCE

The fence around the vineyard represents the presence of the characteristic of Brown's (2012) *shame resilience,* which, in an academic setting, manifests as an ability to move forward through failures – separating these shortcomings from one's own sense of personal identity and worth. Many of the participants expressed a propensity for allowing themselves the grace to make mistakes, while not being overcome with feelings or expressions of doubt, failure, or hopelessness. Doctoral students may experience shame in an academic setting for the very first time because of the vulnerability necessary at this level of scholarship. During the coursework, students must begin to interact with their peers in an advanced academic setting – revealing their abilities or lack of abilities on the course discussion boards or in other group assignment contexts. Once the dissertation phase commences, doctoral candidates must begin to face the very public nature of their finished work. Being evaluated by committee members, dissertation chairs, research specialists, and the wider research community requires a deep vulnerability regarding quality of writing, academic integrity, and the value of the research (and by extension, the researcher). Hannah G., for example, admitted that mistakes caused a certain level of distress:

> Internally, making an error or failure in doctoral experiences was extremely disheartening and threatening to me. I value being excellent at my doctoral studies and thus a mistake or error made me feel careless, under-prepared, and served as a threat to my sense of self. I would worry about it for a long time and the only real way to feel better was to engage in distractions (like exercise).

However, she did not view her errors as irredeemable and was not deterred by them: "*Externally I would try to admit to the error, and apologize, and see what could be done to fix it.*" This demonstration of *shame resilience* (Brown, 2012) served as a protective factor in the participants' ability to develop grit in the quest for a doctoral degree, thereby explaining the decision to represent this characteristic as a fence controlling for pests, rather than as a vine.

FRUIT – DOCTORAL COMPLETION

The fruit of the grapevine, ripe grapes, represents the peak of the doctoral candidate's journey—achievement of the degree. This symbol of *doctoral persistence* aptly epitomizes the culmination of the committed belief and continuous effort required to reach the important milestone of completion. However, the selection of grapes is an intentional decision in that, just as earning a terminal degree is not truly an ending but instead a beginning, harvested grapes are only the first step of a rich refining process which develops world renowned fine wines. Similarly, doctoral completion opens the gateway to limitless possibilities in both arts and sciences. Heather G. captured the relief of finishing and the continuing development that she is pursuing:

> Finishing my DNP was at first just a great relief, no more papers hanging over my head! Then I started to hear my new name. I was a Dr.! To hear my students refer to me as doctor made me feel like I was finally

legit, like I deserved to be a professor for the first time. My mother had been a PhD and I grew up hearing her students call her Dr. She died before I even started teaching, but I knew she would have been proud. It was, and still is, a bit surreal to think that I have attained a terminal degree, reached the end of the line in my education. Then again, I'm currently working on my Certified Nurse Educator certificate, so maybe we are never really done!

This Grit Growth Model—grapevine, support structure, vinedresser, and enclosure—illustrates the process of grit and growth mindset development in doctoral completers. Just as the parts of this intricate system all coalesce to successfully produce delicious fruit, the experiences, values, protective factors, and relationships of doctoral students all converge to bring their dream of degree completion to sweet fruition.

DISCUSSION

Doctoral completers in this study reported a resounding belief in their own human potential to improve and grow, particularly in the personal trait of grit. This finding confirms prior research indicating that grit and growth mindset interventions led graduate students and professionals to believe that they can "begin to take responsibility for their own personal and professional success and development" (Pueschel & Tucker, 2018, p. 7). Findings not only confirm prior knowledge about the connection between growth mindset and academic success (Dweck, 2016; Dweck et al., 2014), but also extend that association to include doctoral achievement in particular. The quantitative results of this study indicated that 75% ($n = 9$) of the interview participants subscribed to a growth mindset. However, the qualitative data suggested an even higher percentage, revealing the capability of the nuance of language and context to communicate a more accurate forecast of implicit theories.

Dweck (2016) asserted that a growth mindset might be passed on to others through the correct use of praise and proper response to failure. The results of this study introduce a wide range of other possibilities that may foster a growth mindset. As one example, doctoral completers endured significant loss in their lives. Tedeschi and Calhoun (2008) detailed a phenomenon called *posttraumatic growth*, which may be useful in understanding the mindset of future doctoral students who experience personal loss:

> The kinds of growth experiences described by persons who have faced the struggle with bereavement tend to fall into five general categories: the experience of the emergence of new possibilities, changes in relationships with others, an increased sense of personal strength, a greater appreciation for life, and changes in existential and spiritual orientations. (p. 32)

Posttraumatic growth aligns with other lines of research, namely the concept of *steeling effects* (Doherty, et al., 2018), which refers to the strengthening effect of overcoming adversity. Therefore, the findings from this study corroborate prior research that personal loss acts as a catalyst for personal growth—as well as built-in resistance to future adversity—and may be instrumental in removing implicit barriers to a growth mindset.

The findings of this study also align with the literature surrounding a positive relationship between grit and academic achievement (Climer, 2017; Duckworth et al., 2011), as 100% of the interview sample ($n = 12$) and 98% of the larger survey sample ($n = 51$) scored as having high grit. Duckworth (2016) posited several possible internal factors that may develop grit, including natural interests and passions, affirmed in the category of *passion,* expressed by several participants. Previous researchers also found an innate sense of a larger purpose or calling enhances a person's degree of effort significantly toward achieving a long-term goal, especially if the goal benefits others (Hill et al., 2016; Von Culin et al., 2014). Through the findings of religious and vocational *service*, participants confirmed their desire to make a difference for the sake of others. This finding aligns with Von Culin et al.'s (2014) assertion that motivation to pursue goals increases when the goal is related to others, and that "the desire for meaning and purpose in life seems to contribute to both facets of grit" (p. 311).

Duckworth (2016) also suggested several extrinsic factors that may develop grit. One such factor, an authoritative style of parenting, characterized by high level of demand in a supportive environment, has been correlated with higher levels of grit (Guerrero et al., 2016). Findings corroborated this link between authoritative figures and grit within the category of *expectations*. Multiple participants testified of the influence of parents, teachers, dissertation chairs, or other significant people in their backgrounds who required a certain standard of performance, effort, or behavioral output in a supportive environment. Additionally, Harry and others expressed that their parents focused more on effort than achievement, indicating that the authoritative figures also subscribed to a growth mindset, opening yet another avenue of inquiry for future research.

Duckworth's (2016) contention that grit grows from consistent and intentional practice was also supported by findings within the larger theme of *engagement*. Participants engaged in multiple and prolonged extracurricular activities, such as dancing or sports, which demanded such committed practice as Duckworth suggested. However, findings also extended this notion to include a broader range of life experiences—such as changing schools, relocating, and travel—revealing other types of challenging circumstances that can stretch people past the boundaries that are innately comfortable, building internal mechanisms of perseverance.

The results of this study confirm previous research revealing the value of both personal and academic relationships to student persistence efforts (Tinto 1975, 1993). Tinto (1993) theorized that "graduate persistence is also shaped by the personal and intellectual interactions that occur within and between students and faculty and the various communities that make up the academic and social systems of the institution" (p. 231), and findings of this study comprehensively confirm his work.

The central research question, examining how grit and a growth mindset develop and influence doctoral persistence, was divided into three sub-questions in order to examine both the external and internal aspects of grit development in the participants' lives, as well as the relationship between the two characteristics. The first sub-question (SQ1) focused on the external factors: *What life experiences influence the development of grit in doctoral completers?* Participants shared common experiences over the course of their lives which included occasions of significant *loss*, either in the form of loved ones passing, divorce in the family, moving, or professional disappointments. These experiences were shared in response to being asked about the hard parts of either their childhood or adulthood, so the impact of these losses was substantial. The result of personal loss in the participants' lives was a strengthened resolve to finish their course and a renewed perspective surrounding the brevity of life. As they experienced deep, personal loss, they also gained tenacity, and even a sense of urgency.

In addition to loss, participants shared life experiences that involved considerable *engagement* with the wider world beyond everyday living. This engagement included such experiences as travel, relocating, and extracurricular activities and resulted in repeated or long-term personal stretching of the participants beyond their comfort zone. These interactions with the world increased their capacity to exert effort for important goals and galvanized higher levels of tolerance for the unknown. The completers also reported that during their growing up years, as well as during their adult years, they were subjected to high *expectations* of significant others. Usually the expectations centered on academic effort (not achievement), involvement with activities, or a moral code of behavior. Many of the participants reported that the expectations were under supportive circumstances, offering evidence to reinforce Duckworth's (2016) premise that grit grows from the influence of authoritative figures. These expectations naturally instilled a sense of personal responsibility within the participants to take ownership of their own effort and behavior, while also normalizing a system of accountability to others. Finally, common experiences of the participants involved areas of *service*—either military, their chosen professions, or faith-based—present in either their family of origin or their own lives since childhood. These values and experiences surrounding service trained the participants to view the world less egocentrically, developing in them an appreciation for the internal rewards that a life of sacrifice offers.

The participants indicated that they lean heavily on the support of both personal and academic *relationships* to achieve their goals. Most shared that they would not have completed their doctoral degree if it were not for this personal support. This support offered them the encouragement, camaraderie, motivation, and persuasion needed in order to persist in the midst of challenges, as well as celebrate in moments of success or triumph. This relational support was not just unconsciously received—it was intentionally sought. From these relationships, the participants gleaned internal strength to accomplish personal goals, realizing that leaning on others for support is a vital aspect of their pursuit.

The second sub-question (SQ2) was aimed at identifying the common internal factors driving the development of grit: *What values and beliefs influence the development of grit in doctoral completers?* The interviewed participants shared two common categories of values and beliefs. First, most of them subscribed to a certain religious *faith*, all of which centered on Judeo-Christian values. Second, the participants were characterized by a *passion* for either their field of study, for their professional focus, or for learning in general. As pictured in the Grit Growth Model, the faith and passion of the doctoral completers drove the growth of personal characteristics directly (the vinedresser shaping the direction of the vines) and were also deeply connected to their life experiences (the vinedresser watering the roots). Religious faith and passion developed grit by providing a sense of personal purpose that bolstered the participants' degree of effort to complete their degree.

The third sub-question (SQ3) explored the relationship between the characteristics: *What is the relationship between grit and growth mindset in students who persist to doctoral completion?* Although not correlational research, the quantitative data of the study suggested a positive relationship between grit and a growth mindset is probable. However, the quantitative data revealed only a partial picture, which the qualitative data painted more fully. Three of the 12 interviewed participants scored as not having a growth mindset (two scored as fixed, and one scored as neither) on the instrument, while all three explicitly indicated in the reflective journal and the personal interview, that they *do* believe that the development of grit is possible. In light of the quantitative indicators and the supporting qualitative data, we concluded that grit and growth mindset are closely intertwined, thereby resulting in the vines (characteristics) growing closely together in the model.

Two additional characteristics noted in the doctoral completers' personalities were psychological *flexibility* (Williams et al., 2012) and *shame resilience* (Brown, 2012). The doctoral completers demonstrated flexibility by adjusting to unexpected events within their program—effectively navigating uncharted territory that presented frequent and unanticipated turns. Some students experienced roadblocks during the dissertation phase that caused them to lose traction and set them back significantly in terms of time and progress. Others encountered changing criteria or fluid advisor assignments. Through all of these challenges, the participants were able to push through the turbulence, continuing forward progress despite fishtailing circumstances. Additionally, the participants were able to overcome their own mistakes and even failures along the way, exhibiting shame resilience by persevering even when they experienced such setbacks as failing the comprehensive exam twice or having to completely restart their dissertation. Perhaps the earlier challenges in their lives, such as extra-curricular activities, relocating, and having high expectations imposed from authority figures, enabled the participants to face additional, even greater challenges encountered during their doctoral degree.

Finally, after careful analysis of the relationship between all of these findings and making constant comparisons across the gathered data, it was plainly evident that the life experiences and core values, shared by the participants, established a foundation of *Personal and Social Responsibility* (PSR), demonstrated by their actions of excellence and service to others (Ardaiolo et al., 2011); this fostered the development of grit and a growth mindset in their personality leading to their ability to complete an advanced degree. PSR is embodied by students who act with integrity and respond resolutely to an innate sense of ethical responsibility to themselves and the wider world. All of the participants' life experiences and values interfaced to produce both a sense of ownership of their life's path and a moral obligation to positively affect humanity through service. The overwhelmingly consistent message ex-

pressed throughout the data revealed this sense of personal and social responsibility; that is, the ownership that the participants embraced to do all that was necessary to complete the degree in an excellent and ethical manner, as well as a sense of societal obligation or others-centered mentality driving their own achievement. When we revisited highlighted statements from the book, *Grit* (Duckworth, 2016), we realized that the central theme was hidden in plain sight:

> One kind of hope is the expectation that tomorrow will be better than today. It's the kind of hope that has us yearning for sunnier weather, or a smoother path ahead. It comes without the burden of *responsibility* [emphasis added]. The onus is on the universe to make things better. Grit depends on another kind of hope. It rests on the expectation that our own efforts can improve our future. (p. 169)

That message is precisely the story told by the doctoral completers of this study.

THEORETICAL SIGNIFICANCE

This study revealed the important role of personal characteristics, specifically grit and a growth mindset, in doctoral persistence. The unique contribution of this study is the suggestion of a departure from the typical approach of leaders in post-graduate institutions from a student-integration/engagement approach, to a more direct personal development strategy as seen in the Student Development Model of Doctoral Persistence (Hudson, 2020) (see Figure 3). Whereas leaders in doctoral programs have typically pursued avenues such as cohort connections or writing support strategies to encourage completion (Brill et al., 2014; Golde, 2005; Santicola, 2013), the conceptual framework (see Figure 3) of this study suggests an additional approach. Since all of the participants exhibited high grit and most, if not all, demonstrated a growth mindset, these findings highlight personal characteristics that doctoral leaders can cultivate directly to address attrition.

Looking at the conceptual framework, leaders can see that this study does not aim to suggest that direct support efforts on the institution side, nor those relating to student integration, be abandoned entirely. On the contrary, this study confirmed the value of the role of academic relationships and that those efforts should continue. However, findings indicate that program elements designed to increase student grit and a growth mindset offer an *additional* strategy for leaders to add to their student support arsenal.

Not only do the findings indicate the value of grit and a growth mindset to doctoral persistence, but they also introduce a novel contribution of *how* to cultivate these characteristics through the development of *personal and social responsibility*, which is characterized by five dimensions: (a) striving for excellence, (b) cultivating personal and academic integrity, (c) contributing to a larger community, (d) taking seriously the perspective of others, and (e) developing competence in ethical and moral reasoning and action (AAC&U, 2010). This discovery has valuable implications for practice far beyond doctoral study. It is worth noting that if the results had culminated with the categories of *loss*, *expectations*, *engagement*, and *service*, it would be difficult to guide doctoral leaders at this juncture with explicit, actionable advice. Obviously, leaders would not be able to (or even want to) replicate these types of experiences through their graduate programs. However, the central category of *personal and social responsibility* opens up a clear path in the literature—a well-established one—for program leaders to engage with, tailor to, and provide a novel, practical approach to doctoral persistence support for students, , encouraging students to develop the five dimensions and thus increase their individual capacity for doctoral persistence. As can be seen in Figure 3, institutional factors through the leadership of program leaders could bolster grit and growth mindset by encouraging PSR (AAC&U, 2010) through exploring and tapping into individual experiences and resources, including *expectations, engagement, service, loss, passion, and faith,* in addition to the established institutional initiatives.
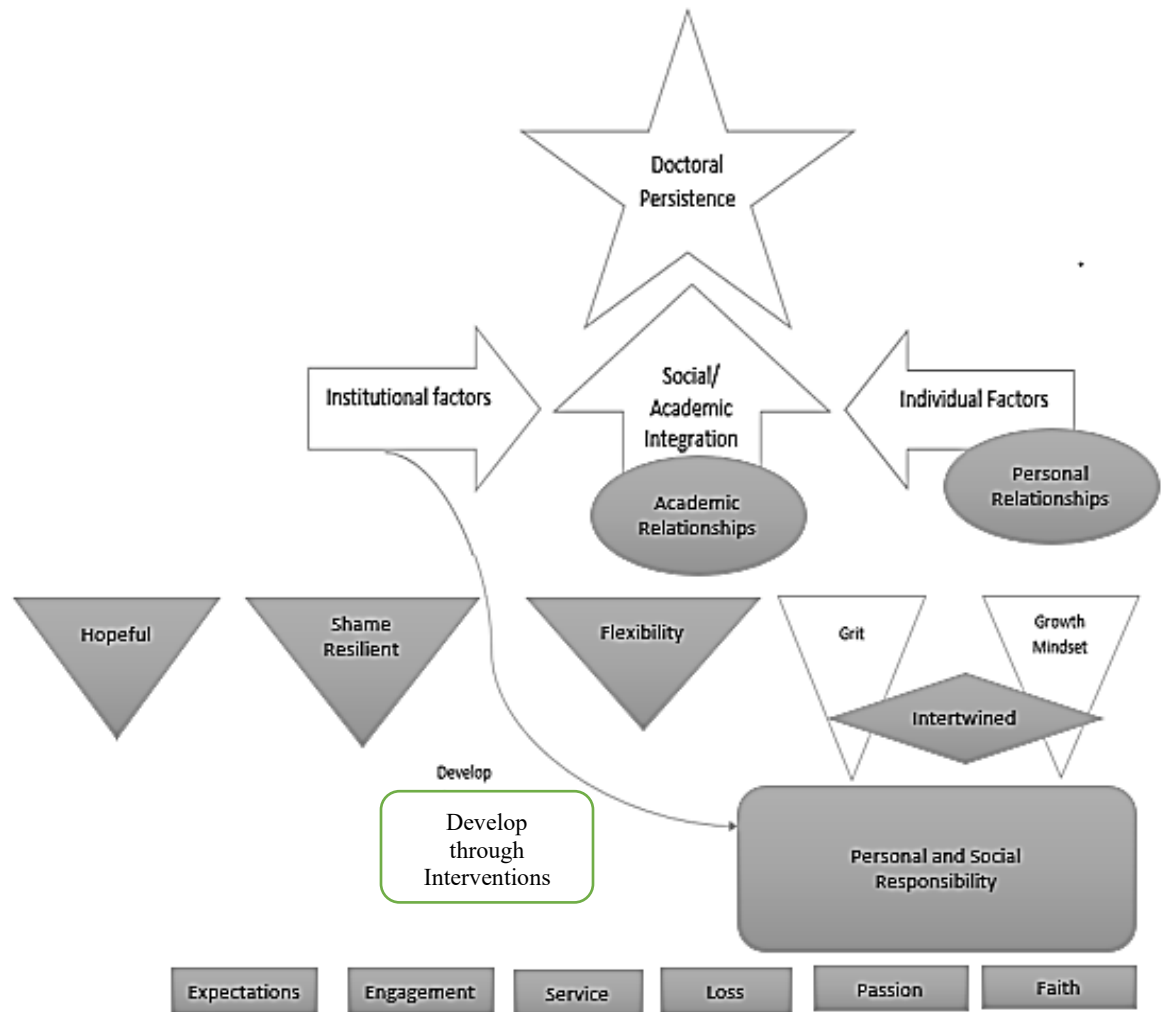
Figure 3. Student Development Model of Doctoral Persistence (Hudson, 2020)

IMPLICATIONS AND RECOMMENDATIONS

The Grit Growth Model offers a rich explanation of the process of grit and growth mindset development in doctoral completers, making it a valuable contribution to the literature surrounding these two constructs, with a variety of theoretical and empirical implications. Additionally, the established connection between these two characteristics and doctoral persistence, especially relating to the core category of personal and social responsibility, is useful for theorists, researchers, and practitioners. These connections can benefit a wide spectrum of stakeholders, including institutional leaders, faculty members, and individuals who desire to develop grit and a growth mindset.

Given the findings of this study, doctoral program leaders should make a concerted effort to add a direct student development focus to their portfolio of strategies to support student persistence, as visualized in the Student Development Model of Doctoral Persistence. Programmatic elements, such as direct provision of grit, growth mindset, and PSR resources through doctoral student communication platforms, could deliver persistence support by means of advancing student metacognition of these principles. Additionally, modules that introduce and inspire growth in these areas using the quantitative instruments for grit and a growth mindset, followed by reflective journaling, direct instruction videos, and post-tests, are suggested. Administrators are encouraged to explore PSR inter-

ventions in the literature to find the right fit for their own doctoral programs, to modify those interventions in innovative ways, and to cultivate PSR at the post-graduate level with appropriate rigor without overly burdening already overwhelmed doctoral students (AAC&U, 2010).

For individuals who wish to develop grit and a growth mindset within themselves or others, by studying the array of categories of experiences and beliefs on the Grit Growth Model, one can see multiple paths to follow on this quest. On the vinedresser, the categories of religious *faith* and *passion* point the way for individuals to pursue development of personal meaning. Participants found a sense of purpose and moral obligation to society from their faith that acted as a guiding force in their lives toward acts of service dedicated to the betterment of society. They discovered true passion in learning, reading, and studying disciplines of interest, resulting in a desire to know more and advance academically, but also to use their knowledge and skills for a greater good. We recommend that individuals consider pursuing religious faith and areas of passion to increase their own sense of personal purpose and life mission.

The life experiences of participants also shed light on multiple avenues individuals can follow to purposefully develop grit and a growth mindset. From the categories of *personal* and *academic relationships*, as well as *expectations*, individuals can learn to surround themselves with people who believe in them, who will push them in times of weakness, who will support them in times of failure, and who will not let them quit a worthy pursuit. Based on these findings, individuals should choose wisely the people they invite into their circle of influence, taking care to create an atmosphere of supportive relationships that encourage growth throughout their lives.

From the category of *service*, we advise individuals to follow the lead of these participants by giving themselves to whatever worthy cause draws them. Military service, public health or education professions, faith-based service, and pro bono opportunities are just a few of the ways the doctoral completers in this study gave sacrificially of their time and resources. Additionally, through reflecting on *loss*, participants revealed their renewed commitment to achieve their goals even when faced with heartache, such as the passing of loved ones, divorce, or professional loss. Likewise, individuals who face significant personal loss should intentionally seek out the comfort and healing they need, while also doubling down their efforts to continue fully living, making the most of short time. Through the category of *engagement*, the participants overwhelmingly communicated that they had spent their lives in pursuit, and at the mercy, of stretching experiences. Through competitive sports, challenging coursework, moving across country, travel, changing schools, music or dance lessons, church involvement, and volunteer work, these individuals live their lives right up to the hilt. Even when the stretching experiences were perceived as negative, the positive effects of the broadening of their horizons and expanding of their perceptions were undeniable. Therefore, individuals who wish to grow their own capabilities to pursue a worthy goal with passion and persistence, should take part in more than everyday life, take chances when they arise, conquer the fear of the new and different, and move beyond their comfort zone whenever possible. This is where real growth takes place and new strength is wrought.

Duckworth (2016) pointed out that very little empirical research has formally inquired into the common life experiences or internal forces that forge grit; the Grit Growth Model provides a pioneering venture toward that end. Future researchers in any field can build upon this model by replacing *doctoral persistence* with their own long-term goals or achievements and representing their findings by adjusting the model accordingly. In this way, the significance of the Grit Growth Model lies in its adaptability to future inquiry, providing a meaningful template to illustrate confirmatory or alternative findings.

LIMITATIONS, DELIMITATIONS, AND FUTURE RESEARCH

By examining commonalities in the participants' general life experiences from childhood through the present day, while also attempting to not overly burden them with a lengthy interview, questions focused on the highlights of their life experiences—both *good* and *hard.* In subsequent research along these same lines, it would be desirable to solicit a follow-up interview to dig deeply into more nuanced life experiences that may not emerge in the initial interview. Additionally, due to the limitations of snowball sampling, future confirmatory research should focus on samples from a wider population who completed at a more diverse group of universities and with more variation in marital status. Participants were purposefully selected based on a desire for maximum variation in terms of demographic characteristics (e.g., age, race, gender) as well as grit and mindset classifications. Incidentally, the final sample represented individuals who were all married, limiting the transferability of findings to individuals who are not married, widowed, or divorced. Finally, although the interview sample size of 12 participants produced findings with theoretical saturation, a larger sample from a wider variety of disciplines and demographics, including unmarried doctoral completers, may paint a more complete picture of the common experiences and values of completers from a broader range of personal and professional backgrounds.

CONCLUSION

Through purposeful and snowball sampling, we recruited 51 doctoral completers as survey participants. These surveys contained demographic questions, as well as the Short Grit Scale instrument (Duckworth & Quinn, 2009) and Dweck's Mindset Instrument (De Castella & Byrne, 2015). Twelve volunteers were purposefully selected as interview participants from this pool. Using coding, memoing, and constant comparison methods central to a grounded theory design (Corbin & Strauss, 2015), we identified prominent themes and categories, collecting additional data (reflective journal assignment and follow-up written/oral interviews) to finalize the core category and resulting theory. The findings of the study, which emerged through triangulation of all data collected (instruments, interviews, journals, follow-up questions) and data analysis methods (coding, researcher memoing, and constant comparison), generated the final product—the Grit Growth Model.

The value of a grounded theory study lies in its accomplishment of not only verifying prior research, but also extending previous concepts for a useful and meaningful purpose (Corbin & Strauss, 2015). The Grit Growth Model produced by this study contributes to the larger body of knowledge in several key areas: (a) Dweck's (1999) Mindset Theory, (b) the Theory of Grit (Duckworth, 2016), and (c) doctoral persistence literature (Lovitts, 2001; Tinto, 1993). The model strengthens previous theory that correlated grit with achievement of goals (Duckworth, 2016), as well as a growth mindset with scholastic success (Dweck, 2016). Additionally, the Grit Growth Model introduces new concepts surrounding the development of personal grit to accomplish long-term goals. In sum, the model illuminates a path for doctoral leaders to directly impact student persistence in terms of purposeful development of these two characteristics through interventions and for various other stakeholders to follow on their mission to ignite these personal characteristics within others, as well as themselves.

In this technological era, institutions must adjust with the times and recognize the evolving needs and limitations of doctoral students. Developing personal characteristics in already matriculated students through interventions has not been heavily pursued at the doctoral level and may supply a missing link in previous persistence models (Astin, 1999; Lovitts 2001; Tinto, 1993). Institutional leaders must begin to explore program initiatives that endeavor to address personal characteristic advancement—specifically those characteristics in this study which are tied to completion—grit and a growth mindset (see Student Development Model of Doctoral Persistence in Figure 3).

For administrators, faculty members, or individuals who wish to focus on growing grit or a growth mindset through interventions that have already been established surrounding the work of Duckworth (2016) and Dweck (2016), effective methods are widely discussed in the literature (Bashant,

2014; Bassett et al., 2013; Dweck et al., 2014; Olson, 2017; Pierrakos, 2017). Not only can existing interventions be explored based on prior research, but also Duckworth has established an organization, Character Lab (https://characterlab.org/), which offers insight and research-based resources to any practitioners seeking to encourage grit growth and serves as a hub for general character development. Dweck has also pioneered a platform for offering mindset development resources, Mindset Works (https://www.mindsetworks.com/default), supplying a number of programs that have established success.

For those who wish to implement their own strategies to develop personal and social responsibility, regardless of the institutional focus, resources are abundantly available as well. The material published by the AAC&U (2010), which "aims to reclaim and revitalize the academy's role in fostering students' development of personal and social responsibility" (p. 1), provides a wealth of information about the important work being done to address teaching for PSR. One of their major projects, a "Leadership Consortium", has comprehensively worked to "expand, deepen, and assess education for personal and social responsibility" at the higher education level. Leaders in higher education and other industries would be wise to study the work that has been done already by the AAC&U (2010) and the Leadership Consortium and adjust these works to fit their needs.

And so, one sees from this study that character development need not stop at the undergraduate level, thereby assuming the undergraduate students' arrival at some phantom level of perfection. This progression of personal growth continues throughout a lifetime—through both natural circumstances and purposeful action—leading to a society which looks to be excellent, not for selfish gain, but for the true benefit of others and a common purpose. For "an individual has not started living until he can rise above the narrow confines of his individualistic concerns to the broader concerns of all humanity" (King, 2000, p. 250). Like King, the participants of this study demonstrated personal and social responsibility that enabled them to achieve a doctoral degree, opening the door for them to accomplish greatness – not merely for their own ends, but for the betterment of others.

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APPENDIX

Interview guide

1. Life experiences (childhood):
   a. Please describe your life experiences as a child up to age 18, focusing on the highlights—what was good about your childhood and what was hard?
   b. Please describe the people who were most influential to you growing up.
   c. How would you characterize yourself as a student in K-12?
   d. If you received a low grade on a test or assignment as a child, how did you feel and respond?
   e. How would you describe yourself as a person at age 18?
   f. Please describe any events, circumstances, or other people that you feel molded you significantly during those growing up years.
   g. Tell me about a time in your childhood when you thought you wouldn't make it. How did you?
2. Beliefs (childhood):
   a. What was important in your home as a child?
   b. What character traits were rewarded?
   c. What character traits were discouraged?
   d. What values or beliefs emphasized in your home shaped the person you became?
3. Life experiences (adult):
   a. Please describe your life experiences as an adult, from 18 up until now, focusing on the highlights: what has been good about your life and what has been hard?
   b. Please describe the people who are most important to you now.
   c. How would you characterize yourself as a student in college?
   d. What was your experience like in graduate school?
   e. Identify a specific success that you are proud of, and why.
   f. Please describe a time that you experienced failure and what attributed to it.
   g. How would you describe yourself as a person now?
   h. What have you learned about life that you try to pass on to others?
4. Beliefs (adult):
   a. What is important in your home?
   b. What character traits are rewarded?
   c. What character traits are discouraged?
   d. What values or beliefs are emphasized in your home now?
   e. What are you most proud of?
   f. As an adult, was there a time when you thought you wouldn't make it? How did you?
5. Doctoral persistence:
   a. Describe your doctoral journey, with focus on the qualities within yourself that supported your own persistence until the end.
   b. Describe specific actions or program features from your institution that pushed you through setbacks.
   c. Tell me about a time when you thought you wouldn't make it. How did you?
   d. Why did you want to get a doctoral degree?
   e. In a single word or phrase, what most helped you finish?

A follow-up Reflective journal assignment was collected by e-mail and once a central theme emerged during analysis, a final set of Follow-up questions was distributed.

Reflective Journal Questions

1. Grit
    a. What do you know about grit? Do you think grit can be developed? If so, how?
    b. Do you know anyone who you think has a lot of grit? How so?
    c. What percentage would you venture that individual grit plays in finishing a doctoral degree?

2. Mindset
    a. What do you know about a growth mindset?
    b. Do you know anyone who has a growth mindset? How so?
    c. Do you think a growth mindset can be developed? If so, how?

3. Final thoughts
    a. Do you have any further thoughts about the potential relationship between grit, a growth mindset, and doctoral persistence?

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Follow-up Questions

1. Would you mind taking a few moments to comment on how each of the following dimensions are evident in *your own* personal and/or professional lives? Feel free to describe the evidence of these characteristics generally or to give specific examples that come to mind. Please do not be humble or shy! Remember your identity is shielded by a pseudonym in the study.
    a. Striving for excellence: developing a strong work ethic and consciously doing one's very best in all aspects of [work/life];
    b. Cultivating personal and academic integrity: recognizing and acting on a sense of honor, ranging from honesty in relationships to principled engagement with a formal academic honors code;
    c. Contributing to a larger community: recognizing and acting on one's responsibility to the educational community and the wider society, locally, nationally, and globally;
    d. Taking seriously the perspectives of others: recognizing and acting on the obligation to inform one's own judgment; engaging diverse and competing perspectives as a resource for learning, citizenship, and work;
    e. Developing competence in ethical and moral reasoning and action: developing ethical and moral reasoning in ways that incorporate the other four responsibilities; using such reasoning in learning and in life.

2. In your personal life, when you make mistakes that hurt others, what actions do you take?

3. When other people in your personal or professional contexts make mistakes that hurt you, what is your thought process and reaction?

4. In an academic setting during your doctoral or previous experiences, when you have made an error or failed, how did you respond internally and externally?

5. Finally, a resounding message we got from the interviews surrounded the concept of personal responsibility, in the sense that, *nobody can get this doctoral degree for me but me*. Can you briefly elaborate on this message as it relates to your own experience or mindset?

BIOGRAPHIES

Dr. Melanie Hudson is an instructor at Liberty University currently teaching courses for the Graduate School of Education and the College of Applied Studies and Academic Success. Her Ph.D. in Higher Education Administration from Liberty University culminated with her dissertation, entitled "Growing Grit to Produce Doctoral Persistence: A Grounded Theory Study", the inspiration for this current work. She previously taught Math Foundations courses at South Louisiana Community College in Lafayette, LA, and homeschooled her own four children for fifteen years. She began her career as a public elementary school teacher, where she enjoyed experiences co-writing and serving as faculty sponsor for a National Learn and Serve America grant, which funded the creation and implementation of a schoolwide conflict resolution program using peer mediation. Her research interests are grit, student persistence, and academic success in higher education.

Dr. Lucinda Spaulding is the chair of special education and a full professor at Liberty University. Born and raised in Ottawa, Canada, she began her career in education as an elementary teacher at an urban charter school in Rochester, NY. She has since served as an English teacher in Japan, a special education teacher in Chesapeake, Virginia, and a research fellow during her doctoral studies. Dr. Spaulding enjoys teaching special education and research courses, serving as a thesis chair, dissertation chair, and research methodologist, as well as faculty sponsor to two student organizations, Autism Speaks and the Council for Exceptional Children. Dr. Spaulding peer reviews, publishes and presents nationally and internationally on topics relating to special education and factors associated with resilience and persistence in higher education.

Dr. Angela Ford began working in education in 2007 and performed a variety of roles in K12, including teacher, guidance director, assistant principal, and principal, until she moved to higher education in 2013. She has worked on a number of research projects and on an international university partnership while working for the George Washington University. She was a Fulbright Scholar to Ethiopia for the 2019-2020 academic year and she is currently an adjunct and subject matter expert for Liberty University as well as an instructor of research at the Governor's School of Science and Technology in Hampton Roads Virginia. Her research interests include comparative studies; unequal learning environments; closing the opportunity gap in a variety of settings worldwide; motivation, aspirations, well-being, and persistence.

Dr. Laura E. Jones is an adjunct professor in the Graduate School of Education at Liberty University, Lynchburg, Virginia. Dr. Jones has taught at all levels of education from preschool through post-graduate. She currently works with doctoral candidates in courses on writing literature reviews and she guides doctoral candidates through dissertation defense. Dr. Jones understands the challenges of doctoral persistence on a personal level and in mentoring doctoral candidates. She has designed courses in growth mindset and grit, given workshops on their incorporation to current educators, and demonstrated grit in her own life as she battled cancer while continuing her career. Dr. Jones' research endeavors include connecting growth mindset and transformative learning for successful integration and retention of Roma students in Romanian schools.