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Grit, goal importance, and construals

Robert Pulvermacher

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ABSTRACT

GRIT, GOAL IMPORTANCE, AND CONSTRUALS

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It has not been conclusively found that grit is a unique construct, with different antecedents and consequences in comparison to traits such as conscientiousness and self-control. These studies measured a possible relationship between grit, goal importance, and level of construal in the face of obstacles and tested if this relationship replicates when using conscientiousness or self-control in place of grit. In Study 1, 170 participants (97 women) were asked to list the first ten goals that came to mind, to separate them into goal domains (e.g., “Academic/Career”), and to rank these domains in importance. I hypothesized that grit would be related to greater disparity between number of goals listed within their most important goal domain (e.g., having a high GPA as a goal within the Academic/Career success domain) and other goal domains, goals within their primary domain would be rated as more important, and goals that required more time to complete would be listed. Only grit predicting the average importance of goals within the most important goal domain was supported. Study 2 tested a mediational relationship between grit and effort through an indirect effect of level of construal. One hundred and fifty-seven participants (84 women)

attempted to complete a task with an unsolvable obstacle. I hypothesized that grit would predict abstract construals in the face of this obstacle when a task is related to an important goal, leading to increased effort. These hypotheses were not supported, and in fact self-control emerged as the only predictor of effort on the goal-related task.

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GRIT, GOAL IMPORTANCE, AND CONSTRUALS

BY

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DEDICATION

To the people I hung out with in the years from about 2009-ish until right now who became
my family

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CHAPTER 1

INTRODUCTION

Background

The goal of this study is to measure the impact of grit and goal importance on construals and to test if this effect is specific to grit or if it replicates with other motivational constructs. This study will help clarify whether gritty people think differently about their primary goals and whether this has an impact on how hard they are willing to work at tasks related to the goal. Specifically, it tests if gritty people might enact abstract construals in the face of obstacles to their primary goals and if the high-level construals encourage sustained effort. This research also measures if this increased effort effect can be replicated when using conscientiousness or self-control in place of grit. If grit, and not conscientiousness or self-control, leads to abstract construals, leading to effort, then evidence will be established for grit as an independent construct with specific processes that lead to specific outcomes.

Grit is a dispositional tendency to persevere in pursuing a goal (Duckworth, Peterson, Matthews, & Kelly, 2007). It is tenacity in pursuit of a challenging long-term goal, as well as an ability to overcome obstacles that impede progress towards the goal. Achievement is approached as a marathon, in which the individual sacrifices herself in persistent pursuit of a long-term goal. Grit has been theoretically divided into two dimensions: persistence of effort and consistency of interest (Duckworth et al., 2007). Persistence of effort is related to affinity for hard work and willingness to expend effort on a goal over time (Duckworth et al., 2007).

Individuals high in this dimension finish what they begin and are less discouraged by setbacks on the way to goal completion. Individuals high in consistency of interest retain enthusiasm in a topic and maintain focus on projects over long periods of time. Historically, grit has been measured as a unidimensional construct, although recent evidence suggests this may not be appropriate, and the perseverance subdimension may be the superior predictor of performance (Credé, Tynan, & Harms, 2016).

Grit and Life Outcomes

Grit correlates positively with long-term goal pursuit, which manifests itself in a variety of life outcomes. Individuals who are grittier are less likely to change jobs (Duckworth & Quinn, 2009). They tend to receive higher level degrees, have higher passage rates at West Point (even when controlling for high school rank), and score at a higher level on the SAT (Duckworth et al., 2007). Grittier individuals are also able to spell more words correctly in National Spelling Bees (Duckworth et al., 2007). Grittier Ivy League undergraduates earn higher grades (Duckworth & Quinn, 2009). To summarize, grit has been shown to positively predict long-term, task-based outcomes.

Grit and Demographic Traits

Older people have more grit than younger people (Credé et al., 2016; Duckworth & Quinn, 2009; Swanson, 1999). Grit is weakly related to gender and ethnicity (Credé et al., 2016). Graduates of two-year college programs tend to have higher grit than graduates of universities. This might be related to the nature of each institution: In community colleges,

where the drop-out rate is generally between 50 and 75%, the environment requires a grittier individual to persevere in interest and effort all the way to degree completion; note that the difference is between graduates, not attendees. In university settings, it seemed possible that the environment would be more likely to encourage motivation over time, and therefore dispositional tendencies to remain motivated will not be as strong of a predictor of graduation rates. Therefore, students who graduate from community colleges would necessarily require higher levels of grit than would graduates of universities, on average. Individuals who have completed only “some college” reported lower grit than any other cohort (Duckworth & Quinn, 2009). This seems to conform to theory, as it represents a population who at some point had a goal (graduating) that they discontinued pursuing.

Grit and General Intelligence

Howe (1999) reviewed the biographical details of such intellectual luminaries as Einstein, Darwin, and the Bronte sisters and concluded that “perseverance is at least as crucial as intelligence....The most crucial inherent differences may be ones of temperament rather than of intellect as such” (p. 15). Duckworth and colleagues (2007) empirically tested this argument, finding that grit is at least as important as intelligence in predicting success in the long-term goals they studied. They argued that grit accounted for more variance in predicting achievement outcomes than did pure intellectual talent; however, a recent meta-analysis conducted by Credé and colleagues (2016) indicated that this was not the case.

Grit, Conscientiousness, and Self-Control

It is important to recognize that grit shares features with other established motivational constructs, including conscientiousness and self-control. Creators of the grit construct argue that it differs from other motivational constructs in its emphasis on long-term stamina as well as the specificity in which goals the gritty individual chooses to pursue (Duckworth & Quinn, 2009). In other words, authors of the grit construct contend that gritty people are more influenced by fewer goals that are more important to them, which this study tests as a predictor of different cognitive processes. Additional research evidence describing possible similarities and differences between grit and conscientiousness and self-control is discussed in Chapter Two.

CHAPTER 2

REVIEW OF LITERATURE

Conscientiousness is the degree of an individual's organization, persistence, control, and motivation in goal-directed behavior (Costa, McCrae, & Dye, 1991). It has subfactors of competence (a belief in one's self-efficacy), order (personal organization), dutifulness (emphasis placed on importance of fulfilling moral obligation), achievement striving (need for personal achievement and sense of direction), self-discipline (capacity to begin tasks and follow through to completion despite boredom or distractions), and deliberation (tendency to think things through before acting or speaking). Like grit, conscientiousness predicts effort, career success, and salary (Judge, Higgins, Thoresen, & Barrick, 1999; Sackett & Walmsley, 2014). In addition, at a trait level, the correlation between the two traits has been measured as .77 (Duckworth et al., 2007), and a recent meta-analysis indicated that correlations between the constructs have been found to be over .9 in several studies (Engel, 2013; Meriac, Slifka, & LaBat, 2015; Reed, Pritschet, & Cutton, 2013), with the meta-analysis itself finding a corrected correlation of .84 between the constructs (Credé et al., 2016).

However, the authors of the grit construct argue that there are theoretical differences between the constructs. Conscientiousness and aspects of conscientiousness are generally measured in the short term, whereas grit is measured with respect to efforts lasting months and beyond (Duckworth & Quinn, 2009). Duckworth and colleagues (2007) argue that grit entails abiding commitment and accounts for incremental validity in predicting success in

long-term goals beyond conscientiousness. That is, conscientiousness (as well as hardiness) is argued to be a superior predictor of effort over the short term, whereas grit is a superior predictor of effort over longer periods of time. Nevertheless, the constructs are clearly related, and in fact, the items of the scales measuring these constructs are quite similar (Credé et al., 2016). Therefore, there still exists a need to establish discriminant validity, which this study attempts to provide.

Grit and Self-Control

Self-control is the ability to have agency over one's thoughts and behaviors in order to conform to internal and external standards (Baumeister, Vohs, & Tice, 2007). Self-control research is often centered on how having self-control can prevent negative life consequences, such as narcotics abuse and violent behaviors (Baumeister, Heatherton, & Tice, 1994; Gottfredson & Hirschi, 1990) and underachieving in school and in work (Baumeister et al., 2007). High levels of self-control are characterized by an ability to hold one's emotions in check, to fulfill one's promises, and to maintain effort (Tangney, Baumeister, & Boone, 2004).

Gritty people do tend to be highly self-disciplined (Duckworth et al., 2007). However, creators of the grit construct argue that self-control is necessary but not sufficient for grit (Duckworth et al., 2007). In other words, grit subsumes self-control and includes additional proactive elements such as a drive for engagement and meaning in one's life (Culin, Tsukayama, & Duckworth, 2014). The constructs also differ in their level of interest. Grit refers to tenacity of goals and interests at a macro level. The individual who is able to exert

self-control in pursuit of healthy eating, who eats the apple instead of the candy bar, might still switch jobs twice a year. Self-control exists at a micro, situational level. For instance, self-control was found to be a superior predictor of performance in West Point in the short term, but grit was a superior predictor of retention over a full year of training, including the exceedingly difficult “Beast Barracks,” which is designed specifically to root out those who are not fully committed to the career (Duckworth et al., 2007).

Grit, Conscientiousness, and Self-Control

All motivation variables are concerned with a need or desire that energizes behavior or directs it towards a goal (McClelland, 1965; McCrae & Costa, 1987). They are all constructs that predict effort towards a goal, including time spent and number of strategies utilized (Costa & McCrae, 1987; Duckworth et al., 2007; Tangney et al., 2004). As discussed above, grit, conscientiousness, and self-control are also all positively related with success in task-based environments. Moreover, some of the items that measure grit are very similar to items on scales used to measure these other constructs (Credé et al., 2016), and the perseverance dimension of conscientiousness is particularly similar to consistency of effort dimension of grit – both are concerned with maintaining drive towards accomplishing a task. These variables are therefore likely to be both theoretically and statistically related.

That said, grit was theorized to be different from these other constructs largely in the specificity of its effects (Duckworth et al., 2007). Whereas conscientiousness is a general tendency to give thought and attention to any task, grit is the tendency to persevere over time in tasks exclusively related to primary goal(s). Grit implies abiding commitment to a

particular goal, to a “single mission” (Tough, 2011). Because there are only so many hours in the day and only so much effort one can put forth, it therefore seemed reasonable to posit that gritty people think differently (and in more depth) about their primary (in comparison to other) goals than does the rest of the population. In other words, grit should be a stronger predictor of performance across longer periods of time in pursuit of a smaller number of goals than should other motivational constructs, if it is, in fact, a unique construct.

To review, there is evidence suggesting that grit should be a stronger predictor for overcoming obstacles to primary goals, over time, beyond conscientiousness and self-control. One possible explanation for these findings may be explored by considering how a gritty person might think about his or her goals. Grit has been characterized as the ability to commit “laser focus” on a finite number of goals, to the exclusion of distractors and other goals. As Duckworth states, “By definition, you cannot be gritty at everything” (as cited in Pappano, 2013, p. 2). For instance, gritty individuals with a goal of winning a spelling bee may become highly-skilled spellers, but simply being limited by time might lead them to be able to commit fewer resources to other goals. When one spends considerable time each day reciting words over the course of months or years, one has little time for other goals. It is therefore possible that one characteristic that distinguishes the gritty individual is that she or he has fewer goals that are of greater importance. This represented a potential indicator of discriminant validity between the grit and conscientiousness constructs; whereas conscientiousness predicts behaviors facilitating goal pursuit across a wide spectrum of goals, grit might predict these behaviors on fewer primary goals. One principal area of interest for this study was whether grit is a stronger predictor of effort for tasks related to these primary goals.

Grit and Construals

One method of determining discriminant validity is by establishing that constructs differ in antecedents and outcomes. One potential consequence that may be specific to grit may be explained by construal theory (Trope & Liberman, 2003). Construal level theory posits that the ways people perceive their goals has implications for behavior and self-regulation (Trope & Liberman, 2003). Specifically, when individuals think about primary, long-term goals, they tend to use big-picture “abstract” construals. When they think about other short-term goals, they tend to use specific “concrete” construals. Using abstract construals has been shown to enhance one’s ability to overcome obstacles, including an enhanced ability to engage in self-control and maintain effort (Trope & Liberman, 2003). As Duckworth states, grit is “about the big picture” (as cited in Lehrer, 2009), and it may be that an ability to focus on this big picture provides a cognitive framework for success.

An example of this relationship can be formulated by considering what happens when a person fails to overcome an obstacle to achieve a goal. There could be two possible reasons for this outcome. The first is that the person is not gritty and is therefore more chronically inclined to disengage before overcoming obstacles (Marguc, Förster, & Van Kleef, 2011). The second is that the individual is gritty, but the goal is not one of the few goals with which the person is deeply concerned. When the goal is not primary, it is possible that gritty individuals are less inclined to adopt an abstract processing style, which would make them less able to integrate the obstacle, find alternative solutions, and commit effort. It is only when the individual is gritty and the goal is a primary one that optimal conditions for enacting

an abstract construal are met. Before elaborating further on this model, this paper describes a general overview of construal theory research to date.

Construal Theory

Construal theory posits that an individual can take either an abstract or concrete perspective towards a target (Liberman & Trope, 1998; Sagristano, Trope, & Liberman, 2002; Trope, & Liberman, 2000, 2003). Abstract construals are broader, whereas concrete construals are more specific. For example, when the topic is brushing your teeth, one can describe the action as promoting dental health (abstract) or moving a brush up and down (concrete) (Vallacher & Wegner, 1987). Abstract construals are related to thinking longer term, whereas concrete construals are related to more short-term thinking (Liberman & Trope, 1998).

Antecedents

Abstract construals tend to occur in a variety of situations. Thinking about events far into the future elicits abstract construals, whereas thinking of events closer in time elicits concrete construals (Eyal, Liberman, Trope, & Walther, 2004). Thinking of other people directs an individual to think in a more abstract manner, whereas thinking of oneself directs more concrete perception (Eyal, Liberman, & Trope, 2008). Events that are less likely to occur tend to be conceptualized abstractly, whereas events that are more likely to occur are conceptualized concretely (Henderson, Trope, & Carnevale, 2006). Taken together, abstract

construals are related to the superordinate, contextualized aspects of a target while concrete construals focus on other and less critical aspects of the target (Trope & Liberman, 2003).

Individuals can be induced to elicit abstract or concrete construals. Individuals who were asked to consider why an event occurred tended to think more abstractly, whereas those who were asked to consider how it occurred tended to think more concretely (Fujita, Trope, Liberman, & Levin-Sagi, 2006). Manipulating individuals to think of events that are far off in terms of the future or distance also encourages abstract thought. Participants asked to describe themselves reading a book the day after the experiment had more concrete descriptions of the task than did participants asked to describe reading a book a year from the experiment (Liberman & Trope, 1998).

Events involving intense emotions tend to impose more immediate processing and therefore encourage concrete construals. Individuals in a study told to emotionally re-experience an event were more inclined to think concretely, whereas those who were directed to objectively recall events fostered a more abstract perspective (Van Boven, Kane, McGraw, & Dale, 2010). Finally, individuals who were directed to focus on aspects of an object (e.g., “leg”) tended to think more concretely, whereas individuals who were directed to focus on exemplars (e.g., “rocking chair”) tended to think more abstractly (Fujita & Han, 2009).

Consequences

One hallmark of research related to construal levels is that high-level (abstract) construals tend to promote pursuit of long-term goals more effectively than do low-level (concrete) construals (Eyal et al., 2004; Henderson et al., 2006). Individuals expressed greater

behavioral intentions related to long-term goals (as opposed to short-term goals) when they were primed with abstract (as opposed to concrete) construals (Eyal et al., 2009). They reported increased willingness to commit effort in pursuit of long-term objectives that were related to values they considered important to themselves. Similarly, when primed with abstract construals, individuals were more able to describe and consider the relationship between their actions and long-term goals (Henderson et al., 2006). This would seemingly predict increased effort towards these goals: seeing the big-picture of how current efforts are able to lead to long-term rewards positively predicts effort (Liberman & Trope, 1998).

Research suggests that abstract construals focus individuals on overarching attitudes and core values, which in turn tends to lead to goal engagement (Trope & Liberman, 2003). Focusing on more concrete, peripheral qualities allows for more influence of the environment. When the decision to continue or cease goal pursuit becomes more situationally determined, the individual is more prone to goal disengagement (Marguc et al., 2011). Therefore, over time, utilizing abstract construals tends to lead to greater congruence between primary goals and behavior.

Abstract construals promote self-control, which has important implications for goal pursuit. Self-control enhances inhibition of behaviors that might distract from goal achievement and facilitate behaviors that lead to goal achievement. Individuals who are primed with abstract construals are more prone to choose behaviors that offer greater, future rewards as opposed to lesser, immediate rewards (Fujita & Han, 2009). They are also more likely to resist temptations. In fact, individuals who are primed with an abstract construal implicitly evaluated immediate rewards, or “temptations,” more negatively than those primed

with a concrete construal. This evaluative change promotes behavioral self-control, which limits the potential of being distracted from goal-congruent tasks.

Construals and Grit

Construals may be especially important for predicting effort when overcoming obstacles related to long-term goal pursuit (Förster & Higgins, 2005). Obstacles can come in a variety of forms, including physical, mental, social, or situational. Using the example of preparation for a spelling bee, potential obstacles include exhaustion, boredom, or a family member's loud talking while the aspiring contestant attempts to learn new words. When faced with obstacles, Lewin (1935) argued that an individual can either cease goal pursuit or take a broader picture of the obstacle. The latter option could reasonably be argued as analogous to abstract construals and implies that individuals who choose to continue goal pursuit in the face of obstacles are likely to utilize abstract construals to overcome them. For instance, the classic study measuring the relative desirability of the candy bar and long-term health provides an example of abstract construals assisting in one's ability to overcome obstacles (Fujita & Han, 2009). When primed with abstract construals, participants were more able to maintain pursuit of their long-term goal of bodily health and ignore the mental obstacle of the candy bar. Taking the bigger, broader picture allowed for an enhanced ability to stay "on course" in the face of a possible action that could derail progress towards a goal.

Obstacles tend to elicit abstract construals, but this relationship depends on a two-step process. First, the obstacle must be perceived as solvable. If it is clear that there is no way to solve the problem, the individual will simply disengage. Second, there must be no obvious

solution. If there is an obvious solution to the obstacle, then the level of construal will be low and focused on enacting the solution. However, when the solution is not obvious, individuals tend to think more broadly about the situation at a higher level of construal (Alter & Oppenheimer, 2008; Förster, Liberman, & Friedman, 2007; Vallacher & Wegner, 1987). To summarize, in order for an obstacle to promote abstract levels of construal, the problem must be believed to be solvable, but there cannot be an immediate and obvious solution present. If these conditions are met, individuals may start to broaden their horizon to encompass possible alternative solutions.

Evidence for the relationship between a dispositional tendency to maintain goal pursuit, obstacles to goal pursuit, and construals was provided by Marguc et al. (2011). Over the course of six studies, the researchers investigated a possible relationship between obstacles to goal pursuit and how the obstacles facilitate abstract construals. They found that taking a broader construal of an obstacle allowed for a wider range of brainstorming methods of overcoming obstacles. Of particular interest to this study is that the authors also found a dispositional tendency to switch or cease pursuing goals, and this disposition impacted construal level. Volatility is the general tendency to be swayed or to disengage from one's pursuits. This construct is conceptually negatively related to grit. The lower the volatility, the more likely an individual is to persevere in staying on task.

Therefore, consequences of volatility were comparable to the hypothesized effect of grit: participants low in trait volatility were more likely to broaden their scope when presented with an obstacle in a maze task, whereas participants high in trait volatility were less likely to broaden their scope when presented with the obstacle. Because of this, low-volatility

participants, those who were less likely to disengage, were more able to overcome obstacles to their goals than were high-volatility participants. This was tested in both trait and state form. Participants could be manipulated into being less willing or able to persevere in goal pursuit, and, when this occurred, they were less likely to enact abstract construals and less likely to keep working. This effect was independent of the mood of the participant as well as the relative difficulty of the specific task. Marguc and colleagues (2011) speculated that enacting abstract construals (or not) is a byproduct of engagement – the individual who is more likely to persevere will spend more time thinking about the obstacle, which will make abstract construals more likely to occur (Marguc et al., 2011). Conversely, the individual who tends to disengage will not persist long enough to see the big picture related to the obstacle. It therefore seems possible that a chronic tendency to work hard and persevere produces a tendency to elicit abstract (as opposed to concrete) construals in the face of goal-relevant obstacles. For gritty individuals, the time they have spent thinking about and working towards a specific goal might therefore increase the likelihood of their enacting abstract construals when they are faced with obstacles to the goal.

This research was designed to test if grit was a stronger predictor of this effect than conscientiousness and self-control. Because the definition of grit implies they will have spent more time working towards and thinking about a primary goal in comparison to other goals, I hypothesized that grit would be a stronger predictor of abstract construals in the face of goal-relevant obstacles. Given that there is evidence that grit predicts effort, construals predict effort, and the above research suggests that grit may elicit abstract construals, a central idea of

this research is that gritty people are chronically predisposed to enact abstract construals, and there may be an indirect impact of grit on effort through abstract construals.

Grit, Construals, and Goals

Based on the research conducted by Marguc and colleagues (2011), there is evidence of a particular relationship between grit, abstract construals, and effort. Because this research posits a particular relationship between grit and goal importance, it extends the proposed mediation such that the interaction between grit and goal importance and effort is mediated by abstract construals as a predictor of effort. For example, a person who is very focused on doing well in her or his career might be more inclined to take a big-picture view of one's progress, and this might assist one in continuing to push when the workload becomes difficult. Conversely, if the person is considerably less focused on maintaining a romantic relationship, he or she might be more inclined to think about how much effort it takes to get ready for a date and thus be less inclined to make the effort. In both cases the relative importance of the goal to the person interacted with her or his grit to elicit abstract construals, or not.

Overview of Research Design and Purpose

This research tested a proposed relationship between grit, goal importance, construals, and effort. The first study aimed to test whether gritty individuals think about goals differently and if this type of thinking is similar to how individuals with abstract construals regard their goals. The second study used an experimental manipulation to test whether an interaction

between grit and goal importance positively predicts abstract construals in the face of an obstacle to a goal and whether level of construal is associated with continued goal pursuit. If these studies indicated that grit was related to construals, it may be the case that gritty people are chronically predisposed to enacting abstract construals when they face obstacles to their most important goals, and this may be a process by which they maintain effort. Both studies included a measure of conscientiousness as well as self-control to test whether the hypothesized effects were specific to grit.

CHAPTER 3

METHODOLOGY – STUDY 1

Evidence that grit differs from conscientiousness and self-control can be identified through an examination of how individuals think about their goals. I hypothesized that gritty people focus on fewer goal domains (e.g., career success, romantic relationships), but they see goals within these key domains (e.g., finding a significant other as a goal within the romantic domain) as more important. As noted, grit is based on fewer goals that the individual focuses on over time (Duckworth & Quinn, 2009). I further hypothesized that gritty people see their goals in broader terms and expect a longer period of time before goal completion. In comparison, the type of goal in consideration should be less relevant to conscientiousness and self-control, as these constructs represent general tendencies to work hard and stave off immediate gratification for long-term success, respectively, and should be less impacted by the perceived value of the goal.

People tend to have similar long-term goals (Cantor, Norem, Niedenthal, Langston, & Brower, 1987). These include success at work, in relationships, and in their hobbies (Little, 1983). However, the perceived value of each of these goals (hereafter referred to as “goal domains” to indicate the difference between higher level and more specific types of goals) varies across people and groups (Little, 1983). It may, therefore, be the case that gritty and less gritty individuals would report the same goal domains when asked to list their primary life pursuits, but they would differ in terms of how they value each domain. However, if gritty

people are in fact more focused on their primary goal domains in comparison to all other domains, they might report more individual goals that they see as related to their primary domain. For instance, the gritty individual who is focused on doing well in his or her career domain likely spends more time thinking about how to progress towards achieving the goal, and when asked is therefore more likely to describe specific goals related to the career advancement domain (e.g., getting a promotion). That is, gritty individuals spend so much time thinking about their goal domains that goals and tasks related to the primary goal domain are more salient, at the expense of goals related to other domains.

Hypotheses

Hypothesis 1a: Gritty people will report a larger difference between number of individual goals listed in their primary and other goal domains (e.g., academic/career success, health, romantic relationships, other relationships, other) than less gritty people.

Hypothesis 1b: In addition to measuring variance of goals within domains, the study will test if only grit (but not conscientiousness or self-control) positively predicts the number of goals related to primary goal domains. This differs from Hypothesis 1a in that it is using the count of goals in the primary domain, as opposed to the difference score between goals related to primary and other domains. Difference scores can lead to issues with reliability and interpretability (see Edwards, 2001), and so this additional test using only goals listed within the primary domain is included as support for Hypothesis 1a.

Hypothesis 2: Grit (but not conscientiousness or self-control) will positively predict the degree of variance in importance of individual goals across goal domains. Gritty people

will consider goals within their primary domain more important and goals within other domains less important than less gritty individuals.

In addition to measuring variance in importance of individual goals, the study will test if gritty people perceive goals within their primary domain as more important. Similar to Hypothesis 1, this additional analysis is included to account for potential issues with the use of difference scores and to provide a more direct measure of how participants view goals within their primary domain.

Hypothesis 3: Grit will positively predict amount of time associated with achieving goals listed. Gritty people, prone to abstract, high-level representations, will list goals that require longer term goal pursuit and will report longer periods of time that they expect to have to continue working to achieve the goals they list. Conscientiousness and self-control will not predict amount of time associated with achieving goals listed. I hypothesize that individuals high in these variables do not have a tendency to think about long-term goals.

Participants

Participants were 83 psychology students from a large midwestern university and 87 Mechanical Turk (Mturk) respondents (total of 170 participants, 97 women, average age of 27.9 years). Psychology students were awarded a credit point for a half hour of participation, while Mturk respondents were paid \$1.50 for survey completion. Mechanical Turk is a crowdsourcing internet platform that allows for easy access to thousands of participants. Research indicates that Mturk respondents are equivalent in terms of both demographics and response patterns to the general population (Berinsky, Huber, & Lenz, 2011), and indeed, the

students and Mturk respondents did not differ in terms of grit, $t(170) = -0.12, ns$; self-control, $t(170) = -.03, ns$; conscientiousness, $t(170) = -1.16, ns$; importance of primary goals, $t(170) = 0.03, ns$; number of goals listed in the primary goal domain, $t(170) = 0.93, ns$; or perceptions of importance within primary goals, $t(170) = 0.55, ns$.

Design

Study 1 used a survey measuring grit, conscientiousness, and self-control as predictors of the manner in which individuals think about their goals.

Procedure

All research was conducted using online survey software. After completing a consent form (Appendix A), participants were given measures of grit (Appendix B), conscientiousness (Appendix C), and self-control (Appendix D). The surveys were presented to all participants in a random order. Following these measures, participants completed a filler task in listing as many of the states within the United States of America as they could for three minutes. The filler task was included in the survey because answering questions about one's predisposition towards goal completion could have feasibly impacted how participants subsequently answered questions related to their individual goals.

Next, participants were taken through a set of procedures adapted from Freitas, Clark, Kim, and Levy's (2009) study that measured coherence and relative importance of goals (Appendix E). Participants were asked to list ten ongoing personal "goals," "strivings," or "purposes," with examples given to make the goal-generating process clear. Examples

provided included both short- and long-term examples of goals and an example from each domain in random order. Of the 170 respondents, 127 reported ten goals, 133 reported nine goals, 148 reported eight goals, 152 reported seven goals, 158 reported six goals, 164 reported five goals, 165 reported four goals, 168 reported three goals, and all participants reported at least two goals. Participants were asked to rate each goal in importance in a series of 5-point Likert scales and asked how long they expected to accomplish the goal. Next, they were given a list of goal domains – work/school, health, romantic relationships, family and friend relationships, and other goals – and asked to sort the ten goals they listed into each domain. After completing the surveys participants were given a demographics form (Appendix F), debriefed (Appendix G), thanked for their time, and assured they would be credited (with cash for Mturk participants and class credit for students) within 48 hours. They were also given contact information if they had any questions or issues with the study.

Measures

Grit. The 12-item grit scale is a self-report measure of grit (Duckworth et al., 2007). The scale measures two dimensions of grit, consistency of interest ($\alpha = .85$) and consistency of effort ($\alpha = 0.78$), on a 5-point Likert scale ranging from 1 (*Not at all like me*) to 5 (*Very much like me*). Sample items for interest include, “I often set goals but later choose to pursue a different one” (reversed), and for effort include, “I have achieved a goal that took years of work.” Grit has generally been measured as a unidimensional construct ($\alpha = .85$ for current study), but a recent meta-analysis by Credé and colleagues (2016) indicated that the

dimensions are distinct and that perseverance tends to be a stronger predictor of performance outcomes.

Conscientiousness. The conscientiousness subfactor of the IPIP measuring constructs similar to the NEO-PI-R Inventory is a 24-item self-report measure on a 5-point Likert scale ($a = .87$), ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) (Johnson, 2014). Sample items begin with the stem, “I see myself as someone who,” and possible derivations include “Completes tasks successfully” and “Works hard.”

Self-Control. The self-control scale (Tangney et al., 2004) contains 10 items, rated on a 5-point Likert scale ranging from 1 = (*Not at all like me*) to 5 = (*Very much like me*). Sample items include, “I have a hard time breaking bad habits” and “I do certain things that are bad for me, if they are fun.” This self-control scale was found to have an internal reliability of $a = 0.81$ (Tangney et al., 2004; $a = .84$ for current study) and was found to allow for more specific measurement of the self-control behavioral domain than other commonly used self-control scales (see de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012).

Research conducted by Maloney, Grawitch, and Barber (2012) found that a two-factor construction of self-control, including restraint and impulsivity, might be more appropriate. Thus, in addition to the traditional one-factor measure of this construct, additional exploratory analyses measured each dimension as aspects of the hypothesized relationships. Grit has been positioned as subsuming self-control but also involving a measure of proactive behavior in addition to the ability to forgo instant pleasures to focus on long-term goals, and so the addition of the impulsive factor might have important ramifications for the analysis. Each

factor had acceptable reliability within the current study (Impulsivity: $a = .72$, Restraint: $a = .70$). However, the individual factors did not differ from each other or from the single dimension of self-control in terms of its relationships with other variables in Study 1.

Individual Goals. The manner in which participants think about their goals was measured via a series of questionnaires adapted from Freitas et al. (2009). Individual goal importance was measured on a 5-point Likert scale ranging from 0 = (*Not at all*) to 4 = (*Extremely*). Mirroring Rim, Hansen, and Trope's (2013) study, participants were asked, "How far in the future do you think it will take for the goal will be accomplished," to assess perceived temporal distance from their goal domains. Participants were allowed to enter their own responses (as opposed to a multiple-choice item that could influence their responses).

They were also told:

It is possible that you will feel that you do not have enough information to adequately respond to this question. If this occurs, do not worry. There are no right or wrong responses to the questions; we are just interested in your intuitive judgments.

Responses were coded in terms of months (e.g., one month = 1). Nonnumeric responses were coded as closely as possible into numeric data. For instance, "a couple of months" was transformed into 2 units.

Goal Domains. Goal domains were developed through a combination of exploratory and theoretical means. Previous research has found that theoretical, economic, aesthetic, social, political, religious, physical well-being, relationship, hedonistic, and personal growth dimensions emerged when participants were asked to consider types of goals that were relevant to them (Roberts & Robins, 2000). However, given that the participants in this study would have to contemplate each of these domains when considering which goal to list them

in, it was decided that the number of domains would have to be reduced. This was done through a combination of steps. First, the original study identified relationship (romantic, e.g., “Having a satisfying marriage/relationship”), hedonist (e.g., “Having fun”), economic (e.g., “Having a high-status career”), and social (e.g., “Helping others in need”) as the most important domains that were internally consistent enough to be considered unidimensional. Second, initial pretesting revealed that a disproportionate percentage of participants were listing relationship goals as the most important domain, and so the domain was split into romantic and friend relationships (the previous scale had not included any questions related to relationships with friends). Finally, pretesting identified so few participants who originally listed goals related to the original social or hedonist domains (note that the original conception of social was related to philanthropy and social justice and was not specifically relevant to socializing with other people) that these domains were excluded from follow-up analyses.

Examples of career goals that were listed by participants in this study included “Getting a good job” and “Making a lot of money at my job.” Examples of health goals included “Running a marathon” and “Losing weight.” Examples of personal goals included “Get better at making friends” and “Tell my mom I love her more.” Examples of romantic goals included “Get married” and “Get a boyfriend.” Examples of other goals included “Learn how to cook” and “Beat Doom video game.” On average, participants listed 7.35 goals ($SD = 1.6$).

CHAPTER 3

RESULTS – STUDY 1

Preliminary Analyses

Missing Data

Three participants failed to complete the surveys, and their data were omitted from the analysis.

Outliers

Data could be considered “extreme” in two ways – in terms of response patterns and time spent. Extreme data was included in the analyses – I was interested in respondents who have fairly extreme views of their primary goals. In terms of time spent, three participants finished more than two standard deviations below the average in terms of time spent on the goals questions, and their responses were omitted from the analysis. For instance, in terms of grit, 11 participants indicated “strongly agree” on all items, and two indicated “strongly disagree on all items. These participants represented outliers, as for the raw score of 5.00 (the highest possible grit score), $z = 1.83$, and for the raw score of 1.00 (the lowest), $z = -2.94$. However, in these cases there was no sign of participants simply rushing through responses, and their scores on conscientiousness and self-control were strongly correlated with their extreme grit scores, so the data was included for analysis.

It was also desirable to first examine whether sample (student vs. MTurk) might be associated with different relationships between the motivational variables and the outcomes. When an interaction term between each motivational trait and condition (using effects coding) was entered into an equation with grit and condition, the interactions between condition and motivational variables were predicted by the study's outcomes.

Trait Descriptive Data

Means, standard deviations, and coefficient alphas of traits are reported in Table 1, goal importance frequency in Table 2, and the average motivational trait across each primary goal in Table 3. Participants who ranked career domains as most important were highest in grit. Correlations between motivational traits and goal domains are reported in Table 4, and correlations between motivational variables were similar as reported in previous studies (see Duckworth & Gross, 2014).

Table 1

Descriptive Statistics for Motivational Traits, Study 1

Trait	Mean	SD	Coefficient alpha
Conscientiousness	3.89	.53	.87
Grit	3.59	.84	.85
Self-Control	3.41	.82	.84

Table 2

Goal Importance Frequency, Study 1

Domain	Most	Second	Third	Fourth	Least
Career	54	29	19	21	47
Health	15	46	38	38	33
Personal	37	28	40	45	20
Romantic	39	42	35	29	25
Other	25	25	38	37	45

Table 3

Study 1 Goals by Motivational Traits

Domain	Grit	Conscientiousness	Self-Control
Career	3.74	3.97	3.61
Health	2.96	3.51	3.00
Personal	3.72	3.82	3.18
Romantic	3.60	4.00	3.49
Other	3.46	3.88	3.41

Analysis of Hypotheses

Study 1 included a series of self-report measures measuring the motivational variables of interest as predictors of variables reflecting how individuals think about their goals. Thus, Study 1 used regressions as a means of statistical analysis, entering grit into a formula with conscientiousness and self-control, in order to examine whether only grit predicted number of goals listed in primary vs. other domains, importance of goals within those domains, and

Table 4

Study 1 Trait Correlations

Trait	1	2	3	4	5	6	7	8	9	10	11
1.Grit	1										
2. Conscien.	.76**	1									
3. Self-Control	.71**	.70**	1								
4. Goals Listed	-.05	.03	.01	1							
5.Goals Listed Difference	-.07	-.06	.01	.20*	1						
6. Primary Domain Importance	.17*	.02	.12	-.20*	.13	1					
7. Primary Domain Importance Difference	.09	-.07	-.01	-.35**	-.62**	.85**	1				
8. Time	-.01	-.08	.04	.02	.17*	.03	.00	1			
9. Age	.15*	.26**	.08	-.12	-.21*	-.13	.05	-.14*	1		
10. Ed Attainment	.05	.05	.05	-.07	-.02	-.09	.06	-.02	.21**	1	
11. Gender	.01	.00	.05	.08	-.09	.20*	.12	-.08	.13	-.24**	1

Note. *= $p < .05$, **= $p < .01$. $N = 170$ for all analysis.

times associated with those goals (see Table 3 for motivational variable by primary goal descriptive data).

Hypothesis 1

Self-reported goals were sorted by participants into one of each group domain (i.e., academic/career success, health, romantic relationships, other relationships, other.) The goal domain that was ranked most important by each participant was identified. Then, the total number of goals within that (primary) category had the total number of goals that were listed (in the initial task) in other domains subtracted from it. This served as the difference score between primary and other goals, and higher numbers indicated a comparatively larger number of goals in the primary goal domain. Grit, conscientiousness, and self-control were then entered into a regression formula as predictors of this difference score.

Hypothesis 1a was not supported, as grit was not a significant predictor of the difference between the number of reported goals within the primary domain and the number of goals reported in other domains when entered into an equation with other motivational variables – grit: $b = -.009$, $t(170) = -0.7$, *ns*; conscientiousness: $b = -0.03$, $t(170) = -0.2$, *ns*; self-control: $b = 0.72$, $t(170) = 0.47$, *ns*. The motivational traits also did not correlate at the zero-order level with the total number of goals reported for the primary goal – grit: $r(170) = -.01$, *ns*; conscientiousness: $r(170) = .08$, *ns*; self-control: $r(170) = .04$, *ns*.

Hypothesis 1b was also not supported, as grit was not a significant predictor of the number of reported goals within the primary domain when entered into an equation with other motivational variables – grit: $b = -0.06$, $t(170) = -0.5$, *ns*; conscientiousness: $b = .01$, $t(170) = 0.1$, *ns*; self-control: $b = 0.91$, $t(170) = 0.56$, *ns*.

There is evidence that a two-factor structure for self-control, composed of impulse and restraint dimensions, might be more theoretically and psychometrically valid (Maloney et al., 2012). Therefore, the hypothesized relationships were also measured while splitting self-control. However, this conception of the construct requires further study to be better understood in terms of its consequences, and so the analyses were exploratory. When self-control was split into impulse and restraint dimensions, restraint did emerge as a significant predictor of number of goals listed within the primary domain – grit: $b = -.011$, $t(170) = -1.00$, *ns*; conscientiousness: $b = -0.08$, $t(170) = -0.73$, *ns*; impulsivity: $b = -0.12$, $t(170) = -1.25$, *ns*; restraint: $b = 0.33$, $t(170) = 3.85$, $p < .01$. Thus, the only variable that predicted goals listed was the impulse subdomain of self-control. The restraint domain also correlated with goals listed at a zero-order level, $r(170) = .16$, $p = .009$, while the impulse domain did not, $r(170) = -.04$, *ns*.

Hypothesis 2

Importance scores for goals within other goal domains were subtracted from importance totals for goals within the primary domain. Higher numbers reflected a greater disparity between the importance of the goals in the primary versus other domains. Grit, conscientiousness, and self-control were entered into a regression formula as predictors of this difference score. Hypothesis 2 was partially supported. The difference score between primary and other goals conformed to the hypothesized pattern – grit: $b = 0.33$, $t(170) = 2.66$, $p < .01$; conscientiousness: $b = -0.29$, $t(170) = -2.46$, $p < .01$; self-control: $b = -0.06$, $t(170) = 0.58$, *ns*. However, because the motivational variables are highly correlated, individual relationships

should also be measured, and here the correlations between motivational variables and the difference score of importance for primary and other goals break down – grit: $r(170) = 0.09$, *ns*; conscientiousness: $r(170) = -0.07$, *ns*; self-control: $r(170) = -0.01$, *ns*. Thus, there does not appear to be a direct relationship between any of the motivational variables and the difference between perceptions of primary and other goals.

The above analysis measured the relationship between these motivational variables and the perceived differences in importance of primary and other goals. However, it may be the case that one's relative level of grit is relevant only for their primary goal domains, without factoring in difference scores related to other domains. That is, because grit is connected to only individuals' most important goals, there is no relationship (positive or negative) between this construct and other goals, and therefore the difference between primary and other goals is not the appropriate outcome of interest. Exploratory analysis indicated that only grit predicted the disparity between primary and other domains – grit: $b = 0.34$, $t(170) = 2.70$, $p < .01$; conscientiousness: $b = -0.26$, $t(170) = -2.05$, $p < .01$; self-control: $b = -0.37$, $t(170) = 0.71$, *ns*. Note that conscientiousness emerged as a negative predictor when entered into the equation. Thus, it seems that the positive correlation between conscientiousness and importance of goals within primary goal domains is, in fact, the result of the shared variance between grit and conscientiousness. Follow-up exploratory analysis revealed that none of the motivational variables were related to the perceived importance of the second most important goal domain's individual goals' importance – grit: $r(170) = .08$, *ns*; conscientiousness: $r(170) = -.09$, *ns*; self-control: $r(170) = .10$, *ns*. In addition, at the zero-order level, grit was the only motivational variable that correlated with the average goal

importance within the primary goal domain – grit: $r(170) = .17, p = .03$; conscientiousness: $r(170) = 0.02, ns$; self-control: $r(170) = 0.12, ns$.

As noted above, there is evidence that when splitting self-control into impulse and restraint conditions, only grit remained a predictor of importance of individual goals: grit: $b = 0.30, t(170) = 1.97, p = .05$; conscientiousness: $b = -0.21, t(170) = -1.51, ns$; impulsivity: $b = 0.12, t(170) = 0.90, ns$; restraint: $b = -0.21, t(170) = -1.68, ns$, and thus the relationships between predictors and outcomes were not changed.

Hypothesis 3

Grit, conscientiousness, and self-control were entered into a regression formula as predictors of time associated with achieving the primary goal domain. Hypothesis 3 was not supported, and furthermore, results indicated that there was no relationship between grit and time associated, whereas a relationship did emerge between time associated with goals and both conscientiousness and self-control – grit: $b = 0.03, t(170) = 0.19, ns$; conscientiousness: $b = -0.3, t(170) = -2.2, p < .01$; self-control: $b = 0.28, t(170) = 2.16, p < .01$. Similar to Hypothesis 2, however, it appears that the relationships between self-control and conscientiousness with perceptions of time were the result of multicollinearity, as none of the motivational variables had zero-order correlations with perceptions of time – grit: $r(170) = -0.01, ns$; conscientiousness: $r(170) = -0.08, ns$; self-control: $r(170) = 0.04, ns$. A principal components analysis also indicated that the items largely loaded on a single factor explaining 31.1% of item variance. Taken together, there does not appear to be strong support for any of

the variables being related to time associated with their goals. In terms of the themes of this research, this brings into question whether grit truly is related to more long-term goals.

When self-control was split into impulse and restraint dimensions, only grit remained a predictor of importance of individual goals – grit: $b = 0.08$, $t(170) = 0.60$, *ns*; conscientiousness: $b = -0.21$, $t(170) = -1.70$, *ns*; impulsivity: $b = -0.08$, $t(170) = -0.63$, *ns*; restraint: $b = 0.30$, $t(170) = 2.87$, $p = .01$. However, the zero-order correlations revealed that restraint approached but did not achieve significance with time expected on goals: $r(170) = 0.14$, $p = .07$. Restraint, then, had an impact on variance within time associated with primary goals only when aspects accounted for by the other motivational variables were accounted for.

Discussion

Limited support was found for Study 1's hypotheses. Grit was not a predictor of the number of goals listed within the primary goal domain, nor did it predict the difference between goals listed in the primary domain and other domains. However, while grit also did not predict the difference in terms of importance of goals within the primary domain in comparison to other domains, it did positively predict the average importance of goals within the primary domain and also maintained a zero-order correlation with importance of individual goals. This suggests that gritty individuals place a higher degree of importance on goals related to their primary domains. This fits with previous studies that indicate gritty individuals are more able to focus on finite goals or goal domains and value these goals to a higher degree (Duckworth et al., 2007; Duckworth & Quinn, 2009). Thus, it may be the case that the importance of goals within the primary domain is the appropriate outcome variable.

However, it is important to note that this research question was somewhat exploratory, and thus further testing is required to support a relationship between grit and individual goal importance.

None of the motivational variables had a significant zero-order relationship with time associated with goals listed, for either the student or Mturk populations. This was expected for conscientiousness and self-control, as these variables are related to chronic tendency to exert effort, regardless of the timeline related to a goal. However, grit has been positioned as especially related to broad, life-long goals, and thus the fact that no relationship was found between grit and time associated with goals challenges the basic conception of the construct. If grit, as it appears, does not have a relationship with the amount of time one associates with accomplishing one's goals, one theoretical differentiator between grit and constructs such as conscientiousness and self-control is shown to not be supported. These results support Credé and colleagues' (2016) meta-analytic findings, in which the discriminant validity of the grit construct was called into question, and there was a great deal of theoretical and statistical overlap found between grit and conscientiousness. However, a suppression effect occurred for conscientiousness wherein, when entered into an equation with grit and self-control, the beta weight between conscientiousness and goal outcomes was uniformly negative. This suggests that the aspects of conscientiousness that are not accounted for by the other motivational variables are in fact negatively related to the salience of most important goals. In other words, controlling for the other variables may allow the unique effects of conscientiousness on goals to emerge. This could be explained by the nature of the conscientiousness construct – it is a

chronic, dispositional tendency to not factor the relative importance of a task before exerting effort towards it, but rather a tendency to work hard to accomplish all tasks.

The restraint dimension of self-control did predict number of goals that were listed within each participant's primary goal domain. It also approached significance in predicting time associated with the goals that were listed. This indicates that, contrary to the argument that grit (argued to contain both restraint and an additional proactive element; see Duckworth & Gross, 2014) has a particular relationship with goal importance, the combination of both dimensions (if, in fact, grit does contain both proactive and reactive elements) is less associated with goal importance than simple restraint. Thus, it seems to be the case that the primary aspect of motivation associated with goal importance is the tendency to disallow oneself from pursuing less useful activities.

CHAPTER 5

METHODOLOGY – STUDY 2

Study 2 was intended to build upon the findings of Study 1. Study 1 measured if gritty people viewed goals in a particular way and with more attention and energy directed at fewer goals. While there was relatively little support found for this line of thinking, it was found that grit predicts the perceived importance of goals within primary goal domains. Study 2 measured if the relationship between grit and goal importance facilitates increased effort and examined the relationship between grit, goal importance, and abstract construals when individuals face an obstacle. As noted, there exists a need to define grit as a construct separate from self-control and (especially) conscientiousness, and one method of accomplishing this is defining processes that are unique to each. I hypothesized an interaction between how important the goal is to the participants and grit in predicting effort when participants are faced with an obstacle. In addition, I predicted that high-grit participants were more likely to enact abstract construals when faced with obstacles. Abstract construals could then predict perseverance of effort (see Figures 1-3).

Hypotheses

Hypothesis 1a. When the goal was of high importance and there is an obstacle, grittier participants will spend more time on the task compared with less gritty participants. There will be no difference between gritty and less gritty participants in the face of an obstacle when

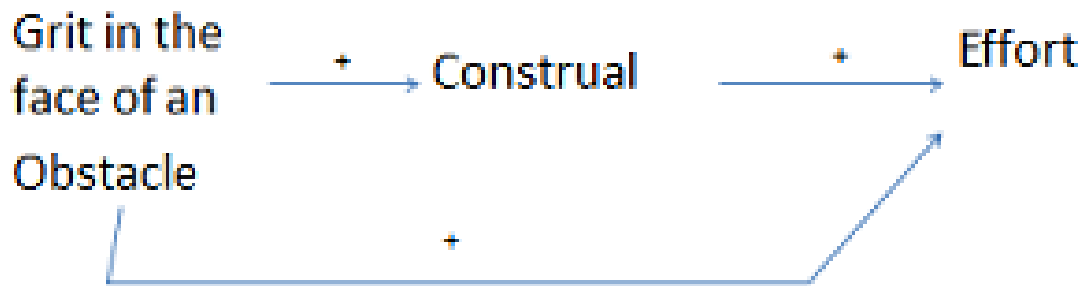


Figure 1. Goal importance is high.

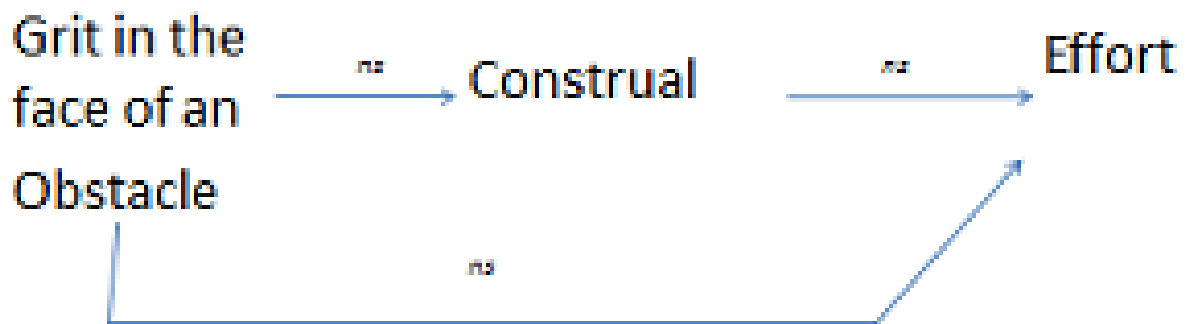


Figure 2. Goal importance is low.

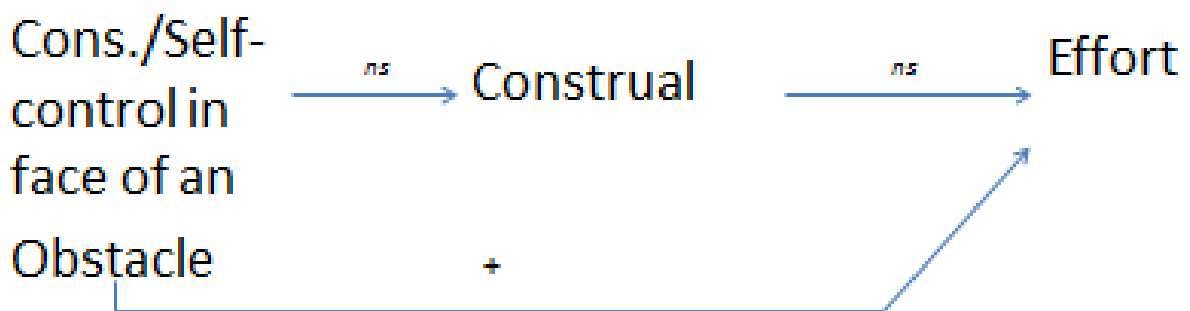


Figure 3. Other variables in place of grit.

the goal is of low importance. There will be non-significant interactions between conscientiousness and goal importance and between self-control and goal importance in predicting time spent in goal pursuit. Importance of goal will be less critical to the conscientious and highly controlled individual, and so there will be no interaction in predicting effort they were willing to put forth.

Hypothesis 2a. There will only be an interaction between grit and goal importance in enactment of abstract construals. When the goal is of high importance and there is an obstacle, grittier participants will be more likely to enact high-level construals on a task than less gritty participants.

In addition, the study continued Study 1's efforts to test discriminant validity between grit and conscientiousness and self-control. As noted, grit may only predict persistence through obstacles to primary goals, whereas conscientiousness is a trait that theoretically predicts effort across a wide variety of goals. Therefore, no interaction was predicted between conscientiousness or self-control with goal importance in predicting abstract construals. There would be a non-significant interaction between conscientiousness and self-control with goal importance in predicting enactment of abstract construals. Importance of goal would be less critical to the conscientious individual, and so there would be no interaction in predicting construals.

Hypothesis 3. Abstract construals will mediate the relationship between the interaction of only grit and goal importance and time spent in goal pursuit. Importance of goal will be less critical to the individual with a high degree of conscientiousness or self-control,

and so there will be no interaction between these variables and goal importance in predicting effort.

Two additional exploratory outcomes were also included in the analysis. The first was time spent on the obstacle versus time spent on the rest of the anagrams. Previous research by Aspinwall and Richter (1999) suggested that some individuals are better at deciding when to cease pursuit of unachievable obstacles in order to pursue other goal-relevant tasks. It may be the case that gritty individuals are more able to decide which obstacles they are able to overcome and in which tasks they should maintain pursuit. As discussed, more work is needed to identify how grit predicts effort over time, and this analysis could help parse apart the effects. If, for instance, grit elicits continued effort towards completing a goal that an individual has no realistic chance of completing, it may be the case that this construct can have detrimental effects in the pursuit of success. However, if the gritty individual is more able to “take the big picture,” the enhanced ability to see means of overcoming obstacles could still represent a positive in achieving one’s goals.

Participants

The participants were comprised of 157 students in an introductory psychology course (42; 28 women, M age = 19.5 years old) and accessed through Mechanical Turk (115; 56 women, M age = 35.25). Each student participant was given 2 credit points for one hour of participation, and each Mturk participant was paid two dollars. In total, 84 women and 73 men participated, with an average age of 31.19 ($SD = 9.85$). This sample was based on the

effect size for the interaction effect obtained from the study conducted by Marguc and colleagues (2011). Students and Mturk respondents did not differ in terms of grit, $t(157) = -0.09$, *ns*; self-control, $t(157) = -.06$, *ns*; conscientiousness, $t(157) = -0.91$, *ns*; time spent on the obstacle, $t(157) = 1.02$, *ns*; or construal, $t(157) = 0.75$, *ns*. When an interaction term between each motivational trait and condition (using effects coding) was entered into an equation with grit and condition, the interactions between condition and motivational variables was associated with any of the study's outcomes.

Design

Grit, conscientiousness, and self-control were measured as continuous variables and tested as factors to predict effort towards a task. Note that goal importance was not manipulated, but rather the importance of career goals for the participant was measured and tested as a continuous factor. In addition, construal level was tested as a continuous mediating variable. The dependent variable was time spent on the task; with number of word jumbles correctly answered was included as an exploratory dependent variable.

Procedure

All research was conducted using online survey software. Participants were asked to read and sign a consent form (see Appendix H). They were then asked to respond to trait measures of grit, conscientiousness, and self-control that were a part of Study 1. Participants received the same questions related to goal importance that were administered in Study 1 (Appendix E). The relevant domain for this study were career success, and the extent to which

participants identified career success as a primary goal domain was measured. Participants were then taken through a filler task of listing different states. Participants were told, “Now I would like you to try to solve a series of puzzles related to one of your life-long goals.”

Participants were then given an anagram task related to career goals. For the task, participants were explicitly told that the anagrams were related to career success and successful completion of the anagrams predicted successful careers (Aspinwall & Richter, 1999). Mirroring Aspinwall and Richter’s (1999) study, participants were told there would be a link between their verbal ability and their performance in an anagram task. Participants were told, “Verbal abilities are highly predictive of success at work. They are generally measured via standardized tests, but because people are highly familiar with standardized tests, today you’ll be working through a less familiar task,” which were the anagrams. Participants were also told, “Success in tasks such as the ones you are about to engage in have been shown to be highly predictive of success in the actual goal.” This was done to encourage buy-in and to remind participants about the goal domain of interest. Participants were then told that they would be presented with a series of sets of anagrams, and their task was to finish as many of them as possible. Participants were instructed that they should try to complete all of the anagrams but could move forward at any time (for an example of the task, see Appendix I). The relationship between success on the task and success in the career was reinforced at multiple times during the study, including questions asking participants, “True or False: Success in this task will predict success at work.”

Participants were then given detailed instructions about how to proceed through the survey containing the anagrams, including switching between three sets and pausing one set

to begin another. Anagrams contained between three and eight letters. This was done to ensure there were enough career-related words and because using a small number of words exclusively might have made it too obvious that the obstacle did not contain the letters of an actual word. Participants solved each anagram by inputting the correct order of letters to make a word. This methodology was used in prior research to measure how participants' personality traits can impact reactions to unsolvable obstacles (Aspinwall & Richter, 1999). Gritty individuals may have different patterns of accomplishing goals, such as first quickly moving on to more solvable-anagrams and then returning to the unsolvable ones or persevering with the unsolvable anagrams. Because of this, each anagram was presented on a different page, and time spent on each anagram was monitored.

The first set of anagrams contained two unsolvable anagrams. This represented the obstacle participants had to overcome. When participants encountered the unsolvable puzzles, it was predicted that the grittier participants would start to think and behave differently than the non-gritty participants, and gritty participants would spend more time attempting to solve the task after the obstacle. After the obstacle, participants received three additional sets of solvable anagrams. Participants were able to move between sets, including coming back to the original unsolvable set at any time. The total amount of time spent was recorded, along with time spent on the obstacle questions. Participants were given as much time as they desired to solve the puzzle. On average, of the ten solvable anagrams, participants solved 8.23 ($SD = 1.42$). Participants were generally correct in their responses ($M = 7.79$, $SD = .86$), although slightly less than a third ($N = 49$) wrote incorrect responses for the unsolvable anagrams. However, participants who did so may simply have felt compelled to put some attempted

response in the blank. After participants decided to end the task, level of construal was measured using the Behavioral Identification Form (Appendix J). Participants were then given a demographics form (Appendix F), fully debriefed (Appendix K), and thanked for their time. They were also given contact information if they had any questions or concerns about the study.

Measures

Grit, conscientiousness, and self-control were all measured with the same scales as were used in Study 1. Alphas for the scales were .85, .85, and .80, respectively (see Table 4 for additional descriptive information.)

Construal Level. The Behavioral Identification Form (Vallecher & Wagner, 1987) contains 25 dichotomous items wherein participants choose between a concrete vs. abstract description of an action. For instance, presented with “Traveling by car,” participants could choose “Following a map” (concrete) or “Seeing countryside” (abstract). The scale had an internal reliability of $\alpha = .90$.

Goals. Goal importance and goal domains were identified and measured in the same manner and with the same procedures as Study 1.

CHAPTER 6

RESULTS – STUDY 2

Preliminary Analyses

Missing Data

One hundred sixty participants started the study. Because all questions were mandatory to response, the only case of missing data were two Mturk participants who stopped and exited out of the study. One participant was eliminated from analysis for taking less than two standard deviations below the average in terms of time spent on the study and who answered with the same response to all questions. These participants were not included in the analysis.

Participants ranked career, personal, health, romantic, and other goal domains in importance in order to identify primary and other goals. Career domains were most likely to be considered the most important domain by participants, and participants who ranked goal domains as the most important were the highest in grit.

Manipulation Check

Participants were asked, “Success on this task is related to success in my career,” on a 5-point Likert scale ranging from “*Strongly Disagree*” to “*Strongly Agree*.” The average response was $M = 4.52$, indicating that the manipulation was effective.

Outliers

Extreme data was included in the analyses – I was interested in respondents who have fairly extreme views of their primary goals. However, in terms of both motivational variables as well as importance of goals, univariate outliers were assessed using the Explore function in SPSS as well as a plot of externally studentized residuals. A single participant was excluded due to taking over two standard deviations of time less than the average. Winsorizing participants who had extreme amounts of time spent post-obstacle ($N = 8$) did not impact the relationships between predictor and outcome variables.

Normality

Univariate normality was assessed using a histogram, with the grit and goal as the horizontal axis and construal as the vertical axis, along with construal and effort. Skew and kurtosis were assessed using the aforementioned Explore function in SPSS. For multivariate normality (as well as linearity), the bivariate scatterplots of each pair of dependent variables was inspected, and normality of the dataset was supported.

Trait Descriptive Data

Means, standard deviations, and coefficient alphas of traits are reported in Table 5, goal importance frequency in Table 6, and the average motivational trait across each primary goal in Table 7. Correlations between motivational traits and goal domains are reported in Table 8; correlations between motivational variables were similar as reported in previous studies (see Duckworth & Gross, 2014). Note that the relative frequency of goal domain

importance varied to a large degree across studies while the average levels of grit, conscientiousness, and self-control remained relatively constant.

Table 5
Descriptive Statistics for Motivational Traits, Study 2

Trait	Mean	SD	Coefficient alpha
Conscientiousness	3.96	.63	.85
Grit	3.57	.84	.85
Self-Control	3.55	.89	.80

Table 6
Goal Importance Frequency, Study 2

Domain	Most	Second	Third	Fourth	Least
Career	43	47	32	12	19
Health	23	25	42	23	40
Personal	31	37	32	33	20
Romantic	32	29	21	34	37
Other	24	15	26	51	37

Table 7
Goals by Motivational Traits, Study 2

Goals	Grit	Conscientiousness	Self-Control
Career	3.89	4.14	3.72
Health	3.64	4.05	3.84
Personal	3.55	4.01	3.57
Romantic	3.66	4.14	3.67
Other	2.83	3.26	2.81

Table 8
 Trait Correlations, Study 2

Trait	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Grit	1														
Conscientiousness	.82**	1													
Self-Control	.75**	.74**	1												
Construals	.02	.03	.03	1											
Total Time Spent	.04	.06	.18*	.09	1										
Time After Obstacle	.01	.13	.22**	.22*	.15	1									
Correct Responses	.13	.14	.24**	-.01	.27**	.23**	1								
Importance of Career Goals	.09	-.07	.03	.04	.10	-.05	-.07	1							
Importance of Health Goals	-.03	.06	.12	.06	-.00	.08	.05	-.15	1						
Importance of Personal Goals	-.04	.05	-.03	.05	-.11	-.09	-.03	-.48**	-.25**	1					
Importance of Romantic Goals	.06	.08	-.03	.08	.00	.09	.03	-.34**	-.41**	-.11	1				
Importance of Other Goals	-.12	-.17*	-.12	-.02	-.01	-.06	.02	-.04	-.29**	-.12	-.27**	1			
Age	.02	.09	.03	.16*	.01	.16*	.08	-.06	-.04	.03	.08	-.01	1		
Educational Attainment	-.06	-.02	-.08	-.07	-.15	.03	.03	.12	-.08	-.11	.02	.07	.18*	1	
Gender	.05	.11	.09	-.04	-.09	.06	-.02	-.07	-.04	.12	.03	-.04	.18*	-.04	1

Note. *= $p < .05$, **= $p < .01$. $N = 157$ for all analysis.

Analysis of Hypotheses

Multiple regressions were the primary method for analyzing the data. The independent variables included the measures of the motivational variables, ranked importance of goals (most important [1] or not [0]), and the interactions between these variables (motivational trait x goal importance; see Table 7 for motivational variable descriptive data). Dummy coding was used for each goal in the analysis because the comparison of interest was between the primary goal domain and all other goal domains. This model was used to predict overall amount of time spent on the task, which was the study's measure of effort and its dependent variable.

The purpose of the study was to compare the variance explained in the amount of time participants spent on the unsolvable task with the variance explained by the interaction between grit and goal importance with conscientiousness with goal importance and self-control with goal importance. Similar to Study 1, if grit has a particular relationship with goal importance, it may be the case that the interaction of (only) these variables will be related to the amount of effort one is willing to expend, while there is no interaction effect between goal importance and other motivational traits.

Hypothesis 1

Multiple regressions were conducted testing the interaction between grit and goal importance in predicting time spent in goal pursuit. Goal importance, grit, conscientiousness, self-control, the interaction between grit and goal importance, the interaction between conscientiousness and goal importance, and the interaction between self-control and goal

importance were entered into an equation. Only the interaction between grit and goal importance was hypothesized to have a significant effect on effort. Grittier participants were hypothesized to spend more time on the task related to success in their careers when that is important to them, and they are confronted with an obstacle to that task than less gritty participants. There was hypothesized to be no difference between gritty and less gritty participants when the goal was of low importance or when there was no obstacle. In addition, the interaction terms between conscientiousness and goal importance, as well as self-control and goal importance, were individually entered into follow-up regressions for a stricter test of their effects on effort and to rule out the possibility that the absence of their effects were due to shared variance with the other individual difference variables.

Hypothesis 1 was not supported, as none of the motivational variables or their interactions with career importance predicted time spent after the obstacle – grit: $b = 0.45$, $t(157) = 1.15$, *ns*; conscientiousness: $b = -0.01$, $t(157) = -0.03$, *ns*; self-control: $b = -0.09$, $t(157) = -0.09$, *ns*; importance of career goals: $b = 0.25$, $t(157) = 0.5$, *ns*; the interaction of grit and career importance: $b = -1.4$, $t(157) = -1.68$, *ns*; the interaction of conscientiousness and career importance: $b = 0.15$, $t(157) = 0.16$, *ns*; the interaction of career importance and self-control: $b = 0.87$, $t(157) = 1.3$, *ns* (see Table 8 for zero-order correlations). Self-control did correlate with time spent after the obstacle: $r(157) = 0.18$, $p = .02$, whereas grit: $r(157) = 0.04$, *ns*, and conscientiousness: $r(157) = 0.06$, *ns*, did not. Self-control was also the only motivational variable that correlated with total time spent on the task: $r(157) = 0.23$, $p < .01$; grit: $r(157) = 0.07$, *ns*; conscientiousness: $r(157) = 0.09$, *ns*.

Self-control was tested as two separate dimensions, as in Study 1. When split into restraint and impulse subdimensions, only impulsivity had a zero-order relationship with time spent – impulsivity: $r(157) = 0.20, p = .01$; restraint: $r(157) = 0.15, ns$. Thus, it seems to be the case that only the impulse subdimension of self-control has a relationship with effort on the task. However, when entered into a regression with the other motivational variables, neither self-control subdimension emerged as a significant predictor (*ns*).

When time spent before the obstacle was controlled for, none of the variables were predictors of time spent after the obstacle – time spent before obstacle: $b = .11, t(157) = 1.28, ns$; grit: $b = .47, t(157) = 1.22, ns$; conscientiousness: $b = 0.02, t(157) = .06, ns$; self-control: $b = -0.15, t(157) = -0.48, ns$; importance of career goals: $b = 0.30, t(157) = 0.61, ns$; the interaction of grit and career importance: $b = -1.4, t(157) = -1.68, ns$; the interaction of conscientiousness and career importance: $b = 0.03, t(157) = 0.03, ns$; the interaction of career importance and self-control: $b = 0.92, t(157) = 1.38, ns$. This implies that self-control may have similar effects in terms of effort both when there is an obstacle and when there is not. Therefore, self-control may be the strongest variable in determining effort across all levels of difficulty in goal achievement.

Using the same variables as predictors of overall performance, again, only self-control had a significant correlation with total number of correct answers – $r(157) = 0.24, p < .01$, while grit: $r(157) = 0.04, ns$, and conscientiousness: $r(157) = 0.14, ns$, did not. When entered into a regression with goal importance and interaction terms, none of the variables predicted performance: grit: $b = -0.07, t(157) = -0.18, ns$; conscientiousness: $b = -0.3, t(157) = -0.79, ns$; self-control: $b = 0.37, t(157) = 1.26, ns$; importance of career goals: $b = -0.57, t(157) =$

-1.16, *ns*; the interaction of grit and career importance: $b = -0.03$, $t(157) = -0.04$, *ns*; the interaction of conscientiousness and career importance: $b = 0.69$, $t(157) = 0.73$, *ns*; the interaction of career importance and self-control: $b = -0.13$, $t(157) = -0.19$, *ns*. Therefore, only self-control appears to have a relationship with performance related to career goals, and this relationship is not distinct from those of performance with other motivational variables. When split into restraint and impulse subdimensions, only impulsivity had a zero-order relationship with time spent – impulsivity: $r(157) = 0.27$, $p < .01$; restraint: $r(157) = 0.12$, *ns*. Thus, it seems to be the case that only the impulse subdimension of self-control has a relationship with effort on the task. However, when entered into a regression with the other motivational variables, neither emerged as a significant predictor (*ns*).

Hypothesis 2

A regression was run testing goal importance, grit, conscientiousness, self-control, the interaction between grit and goal importance, the interaction between conscientiousness and goal importance, and the interaction between self-control and goal importance in predicting abstract construals. Only grit and goal importance were hypothesized to interact to predict abstract construals.

Hypothesis 2 was not supported. When included in a regression model, none of the independent variables emerged as significant predictors of construal – grit: $b = 0.17$, $t(157) = 0.44$, *ns*; conscientiousness: $b = -0.22$, $t(157) = -.57$, *ns*; self-control: $b = 0.27$, $t(157) = 0.9$, *ns*; importance of career goals: $b = -0.12$, $t(157) = -0.25$, *ns*; the interaction of grit and career importance: $b = 0.32$, $t(157) = -0.39$, *ns*; the interaction of conscientiousness and career

importance: $b = 0.82$, $t(157) = .88$, *ns*; the interaction of career importance and self-control: $b = -0.31$, $t(157) = -0.47$, *ns*. The impulsivity and restraint dimensions of self-control and their interaction terms were also not significant predictors of construal, *ns*. Grit and the interaction between grit and goal importance also did not predict construal when entered by themselves into a regression equation as predictors of construal – grit: $b = 0.08$, $t(157) = 0.8$, *ns*; interaction between grit and goal importance – grit: $b = -0.15$, $t(157) = 1.52$, *ns*.

Hypothesis 3

Construal did correlate with time spent after the obstacle, $r(157) = 0.22$, $p < .01$, supporting previous findings that abstract construals are related to greater effort and higher degree of state self-control. However, it did not correlate with total correct answers, $r(157) = -0.09$, *ns*.

Hayes's (2012) methodology for testing for mediations via bootstrapping was utilized. This method of measuring mediations is preferred because it does not assume normality. Goal importance, grit, conscientiousness, self-control, the interaction between grit and goal importance, the interaction between conscientiousness and goal importance, and the interaction between self-control and goal importance were entered into a regression formula with abstract construals as a mediator and time spent in goal pursuit as the outcome variable. Tests of significance between 1) the interactions and the dependent variables and 2) level of construal and the dependent variables had already been tested in Hypotheses 1 and 2, but in step 3, the level of construal was included in the model as a mediating variable between the interactions and the dependent variables. Degree of mediation was measured by the predictive

power of the interaction by itself in comparison to when level of construal was entered into the equation, with the prediction that they would be rendered non-significant in the latter case. Abstract construals were hypothesized to mediate the relationship between grit and goal importance in predicting time spent in goal pursuit.

None of the motivational variables or their interactions with goal importance predicted construals; see Hypothesis 2. In addition, the unstandardized indirect effects were computed using construal as a mediator of grit, conscientiousness, self-control, and the interactions between each variable and career importance with time spent on the task after the obstacle at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized effect was -0.17, and the 95% confidence interval ranged from -6.54 to 15.45, indicating that the indirect effect was not statistically significant. In addition, the indirect effect of construal as a mediator between the interaction of grit and career importance and time spent was -0.16, and the 95% confidence interval ranged from -0.6 to 0.04, indicating that the indirect effect was not statistically significant. With grit (as opposed to the interaction between grit and career importance) as the predictor, the bootstrapped unstandardized effect was -0.28, and the 95% confidence interval ranged from -1.29 to 2.42, indicating that the indirect effect was not statistically significant.

In addition, the indirect effect of construal mediated grit, conscientiousness, self-control, and the interactions between each motivational variable and career importance with correct responses at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized effect was 0.00, and the 95% confidence interval ranged from -0.04 to 0.05, indicating that the indirect effect was not statistically significant. In addition, the indirect effect of construal as a mediator between the interaction of grit and career importance and correct responses was

0.00, and the 95% confidence interval ranged from -0.00 to 0.01, indicating that the indirect effect was statistically significant. With grit as the predictor, the bootstrapped unstandardized effect was 0.00, and the 95% confidence interval ranged from -0.04 to 0.02, indicating that the indirect effect was not statistically significant.

Discussion

Despite research evidence that abstract construals are related to a dispositional tendency similar to grit, no relationship was found between grit, abstract construals, and effort in the face of an obstacle. The mediation model for Study 2 was not supported, and an indirect effect was not found between grit and effort through abstract construals. Further, there is evidence that self-control is more relevant than grit in terms of overcoming obstacles, as the constructs were correlated, and both were related to effort (see Table 8). Further, construal only correlated with time spent after the obstacle and not total time spent on the task, while self-control correlated to a greater degree with time spent after the obstacle than with total time spent as well (see Table 8). It may be the case that the ability to see the big picture that facilitates continued effort in the face of obstacles that was tested as a consequence of grit may instead be related to self-control. Overall, Study 2 provided evidence for the unique nature of the self-control construct while failing to provide argument for a difference between the grit and conscientiousness constructs.

It is interesting to note that self-control seems to have a relationship with both willingness to continue after encountering an obstacle and overall performance on the obstacle task, while both grit and conscientiousness do not. As noted by Duckworth and

colleagues (2007), grit is intended to be more proactive than self-control – it entails actively working towards completing a goal in addition to the willingness to put off short-term rewards for the greater good. It seems that this ability to delay reward may be the only aspect of one’s motivational tendencies that is relevant to the desire and ability to overcome obstacles. This might have important ramifications for how I think of one’s ability to overcome obstacles, as it may be the case that simple persistence and grinding towards overcoming an obstacle is less relevant than one’s tendency to hold off on distractions and immediate rewards. Indeed, when self-control was split into impulsivity and restraint sub-dimensions, only the restraint dimension retained the relationships described in the study. In this context, the ability to not pursue goals that are separate from the task may be more important to self-regulation in this context than the effort in pursuing goals that are part of the task.

CHAPTER 5

DISCUSSION, LIMITATIONS, AND FUTURE DIRECTIONS

Discussion

Taken together, these results indicate that the basic premise of the study, that grit has a particular relationship with primary, long-term goals, has limited support. Grit did not predict the difference between the number of primary and other goals listed, and it was not related to time associated with listed goals. Grit was the only predictor of importance of individual goals within the primary domain but did not have a significant relationship with the difference score between primary and other goals within domains. Further, in Study 2, grit did not interact with goal importance to predict construals or effort. In fact, self-control emerged as a stronger predictor of time spent after obstacles, and none of the motivational variables interacted with importance of career goals to predict effort or performance in a task related to progressing in their careers.

The lack of support for the study's hypotheses has potential implications for the grit construct. Grit has been positioned as more relevant to longer term goals that are of greater importance to the individual. The current findings are inconsistent with that claim and indicate that the relationship between grit and goals is relatively equivalent to those of conscientiousness and self-control – none of them had a relationship with the time frame associated with goals or with the number of goals participants listed within their most

important goal domain. It must be reconsidered, then, if grit is an independent construct from other motivational variables, with its own dimensions, antecedents, and consequences, or if it is in fact the repackaging of more established constructs, particularly conscientiousness and self-control. While this work is not enough to unequivocally state that the constructs are not distinct, it does fail to support the claim that grit is more relevant for important, long-term goals. Credé and colleagues' (2016) meta-analysis found similar results in terms of a relative lack of evidence across the body of research that grit is distinguishable from conscientiousness.

The finding that grit did positively relate to perceptions of importance of individual goals, but not number of goals listed within primary domains, has some relevant implications. It may be the case that gritty people are more able to specifically define their goals to the extent that they do not think in domains but rather in terms of the particular goal – they may be focused on getting an A in an introductory psychology course to the extent that the domain of academic and career success becomes less salient to them. In other words, grit may be related to individual goals, but not goal domains.

Construal Level Theory

Individuals who are enacting an abstract construal display heightened levels of effort and motivation, as do those who are chronically higher in grit (Duckworth et al., 2014; Trope & Liberman, 2003). Previous research had indicated that individuals who are volatile are less likely to enact abstract construals and therefore exert less effort towards task completion. This research replicated previous findings that both self-control and abstract construals elicited

greater effort in the face of obstacles (Marguc et al., 2011) and extended the research to test a relationship between grit and construals. However, while the relationship between self-control and abstract construals replicated, gritty participants were not more likely to enact abstract construals. Participants who were experiencing more abstract construals did have similar outcomes as those high in self-control, as both constructs were more related to effort before the obstacle as opposed to total effort. It may be the case, then, that priming abstract construals prepares individuals to experience the benefits of self-control.

Limitations

A number of limitations present themselves. Study 1 was cross-sectional and self-report in nature and thus causation cannot be inferred. Additionally, because the surveys were all completed at the same time (although their order was randomized), the study was prone to common method bias. Study 2 was experimental in nature, but it could be argued that the obstacles presented in the study may not authentically represent an obstacle to one's long-term goals, as it is possible that gritty people might pursue other means of achieving their long-term goals when obstacles are presented. If gritty people are in fact more prone to continue expending effort on a particular obstacle, it may also be the case that grit could become a liability, wherein the gritty individual is "stuck" attempting to solve an obstacle when that is not an ideal use of one's time. Further, there are multiple types of obstacles, including those that exist within a given task and others that may emerge from other domains that serve as distractors. Given the need to control for other elements of the study, this

research presented only the first type of obstacle, and future research could measure the effect of grit on obstacles that arise from tasks besides the one participants are presented with.

In addition to the possible issues with the operationalization of obstacles, it may be the case that the lack of support for the hypothesized model was the result of the operationalization of the constructs. Participants may not have mentally connected how important they believed success in their careers to be to performance on the task, despite a series of prompts within the study, including allowing participants to list the goals that are most relevant to them. Ideally, having participants think about the topics and goals for their careers that are most relevant to them would reflexively encourage buy-in, as they would connect the task to those goals. In addition, as indicated above, participants did report understanding that the task and their careers were connected.

It may be the case that having participants list the first ten goals that came to mind may not have been the optimal means of identifying critical individual goals. However, the purpose of the task was to identify goals that were most immediately salient to the individual, and a central hypothesis of the study was that the goals that were more salient to gritty people would be grouped within a limited number of domains. This did not prove to be the case, as there was no relationship found between grit and goals listed, and thus the proposed relationship between grit and salience of goal domains was not supported.

The basic premise of the study lends itself to problems with multicollinearity, as all three variables are highly related to one another. This issue was inherent to the research questions for the study. Grit, conscientiousness, and self-control are highly related to one another and were all included as predictors of the outcomes. Indeed, some of the motivational

constructs that have positive zero-order relationships with goal outcomes and effort became negative when entered into an equation with the other motivational variables, suggesting a great deal of relational overlap. This suggests that these constructs are similar in terms of how they predict performance outcomes. That said, the unique effects that did emerge might suggest that they capture something different from the other measures that were isolated when controlling for similar measures. That said, given instability of effects that can emerge with suppression, the unique effects that emerged for grit as well as self-control should be replicated.

Finally, it could be argued that grit should only be measured over a period of time. For instance, researchers have found that self-control predicts performance at West Point at specific tasks, whereas grit predicts performance at West Point across the entire training period (Duckworth et al., 2007). However, if it is the case that grit's effects become apparent over time, it must also be the case that different processes are enacted at a situational level, and how an individual regards her or his goals has been posited as a particular consequence of grit (Tough, 2011). In terms of the general importance and time frame of goals, this study did not find differences in how the individual high in grit, conscientiousness, or self-control stays motivated in goal-relevant tasks. Future research could check in with participants at different intervals to measure the stability and consequences of grit over time.

Future Directions

The study lends itself to a number of potential paths for future research. One potential area of exploration is whether grit is really a unique construct possessing a particular

relationship with (only) primary goals. This research indicates limited support for a relationship between grit and goal importance, but a different operationalization of the goals might still be of value to the field, as the grit construct is theoretically centered on being relevant to a finite number of very important goals. Future research could weigh the importance of different goal domains as opposed to comparing a single primary goal against all other goals. Also, future research could incorporate an outcome variable that would be the product of effort over time. For instance, if career were the goal of interest, job performance or engagement could be measured longitudinally. If grit is an independent construct, it may be the case that grit would be a stronger predictor of these outcomes over time than other motivational variables.

A recent meta-analysis by Credé et al. (2016) suggested that while the majority of research related to grit had been done at the dimensional level, there may be increased utility in measuring grit at the dimensional levels of interest and effort. Duckworth et al.'s (2007) original analysis of the purported construct indicated few differences in terms of criterion validity with task outcomes, but the subsequent meta-analysis found that the consistency of effort dimension may be a stronger predictor of task outcomes than the consistency of interest dimension (Credé et al., 2016). Future studies could measure if these facets of grit have differential relationships with construals and effort and, in particular, if there are theoretical and practical differences between the consistency of effort dimension and the perseverance dimension of conscientiousness.

Splitting self-control into impulse and restraint dimensions, as first conducted by Maloney and colleagues (2012), strengthened self-control's relationships with both goal

salience (with restraint) and effort towards goals (with impulsivity). Thus, future research could identify different antecedents and outcomes related to each dimension. Based on the results of the current study, it may be the case that restraint is more relevant to planning one's goals, whereas impulse is more relevant to working towards one's goals. In particular, a study measuring goal conception through progress through achievement might be useful to determine the relative efficacy of each dimension across the lifespan of a goal.

Self-control generally emerged as more relevant to outcomes related to goal importance than did grit. One possible explanation for this unexpected finding may be related to the aforementioned restraint aspect of self-control. It may be the case that self-control is more associated with planning towards goal completion, and this may result in efforts towards goals that are more productive. For instance, one hypothetical scenario might be where the gritty person, determined to do well in his or her career, continues committing oneself to a job at which he or she is not talented and/or does not like. However, the self-controlled individual, who has restrained oneself during the planning phase, may spend more time deciding which goals he or she should commit effort towards. Such people may also be more able to switch activities related to goal pursuit; for instance, if focusing on one project at work is proving to be too difficult, they may be more able to recognize this and focus their efforts on a task at which they are more likely to be successful. Again, future research measuring the evolution of goals and how they lead to effort across time would be highly beneficial to the field and could be used to further evaluate discriminant validity between motivational constructs.

Despite first gaining prominence some ten years ago, the state of research related to the grit construct is still in its nascent stages. To better understand the construct validity of this motivational trait, research such as that described in this manuscript is needed. While the basic premises of the study were not supported, the lack of significant findings should also be of interest to the scientific community, as it raises questions as to grit's specificity as a construct and whether it is practically different from established motivational constructs. It may be the case that the construct of grit is unique from conscientiousness, but the measure of grit that is currently in existence fails to operationalize these differences. As noted by Credé and colleagues (2016), many of the items on the grit scale (Duckworth et al., 2007) are virtually identical with items on conscientiousness scales (e.g., Johnson, 2014). Differences between the constructs may be related to different ways of thinking about goals which may also impact the effort an individual is willing to exert to progress towards goal achievement. Thus, one potential area of future research is the development of a new measure of the grit construct with an emphasis on long-term, important goal pursuit.

REFERENCES

- Alter, A. L., & Oppenheimer, D. M. (2008). Effects of fluency on psychological distance and mental construal (or why New York is a large city, but New York is a civilized jungle). *Psychological Science, 19*(2), 161–167. Retrieved from <http://doi.org/10.1111/j.1467-9280.2008.02062.x>
- Aspinwall, L. G., & Richter, L. (1999). Optimism and self-mastery predict more rapid disengagement from unsolvable tasks in the presence of alternatives. *Motivation and Emotion, 23*(3), 221-245.
- Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1994). *Losing control: How and why people fail at self-regulation* (Vol. xi). San Diego, CA: Academic Press.
- Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science, 16*(6), 351–355. Retrieved from <http://doi.org/10.1111/j.1467-8721.2007.00534.x>
- Berinsky, A. J., Huber, G. A., & Lenz, G. S. (2011). Using Mechanical Turk as a subject recruitment tool for experimental research. *Submitted for review*.
- Cantor, N., Norem, J. K., Niedenthal, P. M., Langston, C. A., & Brower, A. M. (1987). Life tasks, self-concept ideals, and cognitive strategies in a life transition. *Journal of Personality and Social Psychology, 53*(6), 1178–1191. Retrieved from <http://doi.org/10.1037/0022-3514.53.6.1178>
- Costa, P. T., & McCrae, R. R. (1987). Neuroticism, somatic complaints, and disease: Is the bark worse than the bite? *Journal of Personality, 55*(2), 299–316. Retrieved from <http://doi.org/10.1111/j.1467-6494.1987.tb00438.x>
- Costa, P. T., McCrae, R. R., & Dye, D. A. (1991). Facet scales for agreeableness and conscientiousness: A revision of the NEO Personality Inventory. *Personality and Individual Differences, 12*(9), 887–898. Retrieved from [http://doi.org/10.1016/0191-8869\(91\)90177-D](http://doi.org/10.1016/0191-8869(91)90177-D)
- Credé, M., Tynan, M. C., & Harms, P. D. (2016). Much ado about grit: A meta-analytic synthesis of the grit literature. *Journal of Personality and Social Psychology*. Retrieved from <http://dx.doi.org/10.1037/pspp0000102>

- Culin, K. R. V., Tsukayama, E., & Duckworth, A. L. (2014). Unpacking grit: Motivational correlates of perseverance and passion for long-term goals. *Journal of Positive Psychology, 9*(4), 306–312. Retrieved from <http://doi.org/10.1080/17439760.2014.898320>
- de Ridder, D. T., Lensvelt-Mulders, G., Finkenauer, C., Stok, F. M., & Baumeister, R. F. (2012). Taking stock of self-control: A meta-analysis of how trait self-control relates to a wide range of behaviors. *Personality and Social Psychology Review, 16*(1), 76–99.
- Duckworth, A., & Gross, J. J. (2014). Self-control and grit: Related but separable determinants of success. *Current Directions in Psychological Science, 23*(5), 319–325.
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 92*(6), 1087–1101. Retrieved from <http://doi.org/10.1037/0022-3514.92.6.1087>
- Duckworth, A. L., & Quinn, P. D. (2009). Development and validation of the Short Grit Scale (GRIT–S). *Journal of Personality Assessment, 91*(2), 166–174. Retrieved from <http://doi.org/10.1080/00223890802634290>
- Edwards, J. R. (2001). Ten difference score myths. *Organizational Research Methods, 4*(3), 265–287.
- Engle, L. I. (2013). *What predicts first semester college performance? Cognitive ability, SAT, conscientiousness, and grit.* (Unpublished doctoral dissertation). Hofstra University, Hempstead, NY.
- Eyal, T., Liberman, N., & Trope, Y. (2008). Judging near and distant virtue and vice. *Journal of Experimental Social Psychology, 44*(4), 1204–1209. Retrieved from <http://doi.org/10.1016/j.jesp.2008.03.012>
- Eyal, T., Liberman, N., Trope, Y., & Walther, E. (2004). The pros and cons of temporally near and distant action. *Journal of Personality and Social Psychology, 86*(6), 781–795. Retrieved from <http://doi.org/10.1037/0022-3514.86.6.781>
- Eyal, T., Sagristano, M. D., Trope, Y., Liberman, N., & Chaiken, S. (2009). When values matter: Expressing values in behavioral intentions for the near vs. distant future. *Journal of Experimental Social Psychology, 45*(1), 35–43.
- Förster, J., & Higgins, E. T. (2005). How global versus local perception fits regulatory focus. *Psychological Science, 16*(8), 631–636. Retrieved from <http://doi.org/10.1111/j.1467-9280.2005.01586.x>

- Förster, J., Liberman, N., & Friedman, R. S. (2007). Seven principles of goal activation: A systematic approach to distinguishing goal priming from priming of non-goal constructs. *Personality and Social Psychology Review*, *11*(3), 211–233. Retrieved from <http://doi.org/10.1177/1088868307303029>
- Freitas, A. L., Clark, S. L., Kim, J. Y., & Levy, S. R. (2009). Action-construal levels and perceived conflict among ongoing goals: Implications for positive affect. *Journal of Research in Personality*, *43*(5), 938–941. Retrieved from <http://doi.org/10.1016/j.jrp.2009.05.006>
- Fujita, K., & Han, H. A. (2009). Moving beyond deliberative control of impulses: The effect of construal levels on evaluative associations in self-control conflicts. *Psychological Science*, *20*(7), 799–804. Retrieved from <http://doi.org/10.1111/j.1467-9280.2009.02372.x>
- Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self-control. *Journal of Personality and Social Psychology*, *90*(3), 351–367. Retrieved from <http://doi.org/10.1037/0022-3514.90.3.351>
- Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime* (Vol. xvi). Stanford, CA: Stanford University Press.
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling. [White paper]. 2012. Retrieved from <http://imaging.mrc-cbu.cam.ac.uk/statswiki/FAQ/SobelTest>
- Henderson, M. D., Trope, Y., & Carnevale, P. J. (2006). Negotiation from a near and distant time perspective. *Journal of Personality and Social Psychology*, *91*(4), 712–729. Retrieved from <http://doi.org/10.1037/0022-3514.91.4.712>
- Howe, M. J. A. (1999). *Genius explained*. New York, NY: Cambridge University Press.
- Johnson, J. A. (2014). Measuring thirty facets of the five-factor model with a 120-item public domain inventory: Development of the IPIP-NEO-120. *Journal of Research in Personality*, *51*, 78-89.
- Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999). The big five personality traits, general mental ability, and career success across the life span. *Personnel Psychology*, *52*(3), 621-652.
- Lehrer, J. (2009, August 2), The truth about grit. *The Boston Globe*. Retrieved from <https://www.bostonglobe.com>
- Lewin, K. (1935). *A dynamic theory of personality* (Vol. ix). New York, NY: McGraw-Hill.

- Liberman, N., & Trope, &. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology*, 75(1), 5.
- Little, B. R. (1983). Personal projects: A rationale and method for investigation. *Environment and Behavior*, 15(3), 273–309. Retrieved from <http://doi.org/10.1177/0013916583153002>
- Maloney, P. W., Grawitch, M. J., & Barber, L. K. (2012). The multi-factor structure of the Brief Self-Control Scale: Discriminant validity of restraint and impulsivity. *Journal of Research in Personality*, 46(1), 111-115.
- Marguc, J., Förster, J., & Van Kleef, G. A. (2011). Stepping back to see the big picture: When obstacles elicit global processing. *Journal of Personality and Social Psychology*, 101(5), 883.
- McClelland, D. C. (1965). Toward a theory of motive acquisition. *American Psychologist*, 20(5), 321–333. Retrieved from <http://doi.org/10.1037/h0022225>
- McCrae, R. R., & Costa, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, 52(1), 81–90. Retrieved from <http://doi.org/10.1037/0022-3514.52.1.81>
- Meriac, J. P., Slifka, J. S., & LaBat, L. R. (2015). Work ethic and grit: An examination of empirical redundancy. *Personality and Individual Differences*, 86, 401-405.
- Pappano, L. (2013). “Grit” and the new character education. *Harvard Education Letter*, 29(1), 1–5.
- Reed, J., Pritschet, B. L., & Cutton, D. M. (2013). Grit, conscientiousness, and the transtheoretical model of change for exercise behavior. *Journal of Health Psychology*, 18(5), 612–619. Retrieved from <http://doi.org/10.1177/1359105312451866>
- Rim, S., Hansen, J., & Trope, Y. (2013). What happens why? Psychological distance and focusing on causes versus consequences of events. *Journal of Personality and Social Psychology*, 104(3), 457.
- Roberts, B. W., & Robins, R. W. (2000). Broad dispositions, broad aspirations: The intersection of personality traits and major life goals. *Personality and Social Psychology Bulletin*, 26(10), 1284-1296.
- Sackett, P. R., & Walmsley, P. T. (2014). Which personality attributes re Most Important in the Workplace? *Perspectives on Psychological Science*, 9(5), 538–551. Retrieved from <http://doi.org/10.1177/1745691614543972>

- Sagristano, M. D., Trope, Y., & Liberman, N. (2002). Time-dependent gambling: Odds now, money later. *Journal of Experimental Psychology: General*, *131*(3), 364–376. Retrieved from <http://doi.org/10.1037/0096-3445.131.3.364>
- Swanson, J. L. (1999). Stability and change in vocational interests. In M. L. Savickas & A. R. Spokane (Eds.), *Vocational interests* (pp. 135-158). Palo Alto, CA: Davis-Black Publishing.
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, *72*(2), 271–324. Retrieved from <http://doi.org/10.1111/j.0022-3506.2004.00263.x>
- Tough, P. (2011, September 14). What if the secret to success is failure? *The New York Times*. Retrieved from <http://www.nytimes.com/2011/09/18/magazine/what-if-the-secret-to-success-is-failure.html>
- Trope, Y., & Liberman, N. (2000). Temporal construal and time-dependent changes in preference. *Journal of Personality and Social Psychology*, *79*(6), 876–889. Retrieved from <http://doi.org/10.1037/0022-3514.79.6.876>
- Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review*, *110*(3), 403–421. Retrieved from <http://doi.org/10.1037/0033-295X.110.3.403>
- Vallacher, R. R., & Wegner, D. M. (1987). What do people think they're doing? Action identification and human behavior. *Psychological Review*, *94*(1), 3–15. Retrieved from <http://doi.org/10.1037/0033-295X.94.1.3>
- Van Boven, L., Kane, J., McGraw, A. P., & Dale, J. (2010). Feeling close: Emotional intensity reduces perceived psychological distance. *Journal of Personality and Social Psychology*, *98*(6), 872–885. Retrieved from <http://doi.org/10.1037/a0019262>

APENDIX A
CONSENT FORM, STUDY 1

I agree to participate in the research project titled “Goals and Strivings” conducted by Robert Pulvermacher, a graduate student at Northern Illinois University and Dr. Amanda Durik, a faculty member at Northern Illinois University. I have been informed that the purpose of the study is to better understand how individuals engage in a letter task. I understand that if I agree to participate in the study, I will be asked to do the following: answer a series of questionnaires, and answer questions about my life goals. I further understand that any information I provide as part of this research will be kept confidential. I am aware my participation is voluntary and may be withdrawn at any time without penalty or prejudice, and that if I have any additional questions regarding this study, I may contact Robert Pulvermacher (pulvermacher111@yahoo.com). I understand that if I wish further information regarding my rights as a research subject, I may contact the Office of Research Compliance at Northern Illinois University at (815) 756-8588.

I understand the primary benefit to me in taking part in this study is in making a contribution to scientific knowledge. I will be paid \$.50 for participating. The survey will take about 15 minutes to complete. I understand that my consent to participate in this study does not constitute a waiver of any legal rights or redress I might have as a result of my participation, and I acknowledge that I have received a copy of this consent form.

I understand that my consent to participate in this study does not constitute a waiver of any legal rights or redress I might have as a result of my participation, and I acknowledge that I have read this consent form.

I have read and understand the above information. I am at least 18 years of age and agree to participate in this (please click below).

APPENDIX B

GRIT SCALE

Grit Scale

	Not at all like me	A little like me	Somewhat like me	Mostly Like me	Very much like me
New ideas and projects sometimes distract me from previous ones.					
Setbacks don't discourage me.					
I have been obsessed with a certain idea or project for a short time but later lost interest.					
I am a hard worker.					
I often set a goal but later choose to pursue a different one.					
I have difficulty maintaining my focus on projects that take more than a few months to complete.					
I finish whatever I begin.					
I am diligent.					
I become interested in new pursuits every few months.					

My interests change from year to year					
I have been obsessed with a certain idea or project for a short time but later lost interest					
I have achieved a goal that took years of work.					

APPENDIX C
CONSCIENTIOUSNESS

Conscientiousness

	Not at all like me	A little like me	Somewhat like me	Mostly Like Me	Very much like me
Complete tasks successfully.					
Excel in what I do.					
Handle tasks smoothly.					
Know how to get things done.					
Like to tidy up.					
Often forget to put things back in their proper place.					
Leave a mess in my room.					
Leave my belongings around.					
Keep my promises.					
Tell the truth.					
Break rules.					
Break my promises.					

Do more than what's expected of me.					
Work hard.					
Put little time and effort into my work.					
Do just enough work to get by.					
Am always prepared.					
Carry out my plans.					
Waste my time.					
Have difficulty starting tasks.					
Jump into things without thinking.					
Make rash decisions.					
Rush into things.					
Act without thinking.					

APPENDIX D
SELF-CONTROL

Self-control

	Not at all like me	A little like me	Somewhat like me	Mostly Like Me	Very much like me
I have a hard time breaking bad habits.					
I get distracted easily.					
I say inappropriate things.					
I refuse things that are bad for me, even if they are fun.					
I'm good at resisting temptation.					
People would say that I have very strong self-discipline.					
Pleasure and fun sometimes keep me from getting work done.					
I do things that feel good in the moment but regret later on.					
Sometimes I can't stop myself from doing something, even if I know it is wrong.					
I often act without thinking through all the alternatives.					

APPENDIX E

GOAL IMPORTANCE QUESTIONNAIRE

Please rank how important you believe each of the following long-term goals domains are TO YOU. Simply click and drag on each goal domain to reposition it. Please have your most important goal at the top, and your least important goal at the bottom.

Personal Relationships Goals: achieving close relationships with family and friends

Romantic Relationship Goals: achieving close relationship with romantic partner

Career Goals: performing well at work, receiving raises and promotions

Health Goals: maintaining and improving mental and physical wellness and fitness

Other goals: service to community, advancing in hobbies, or gaining experience in skill in something besides goals listed above

APPENDIX F
DEMOGRAPHIC FORM

Demographic Form

Please describe which of the following categories best describes you:

(Circle one)

1. Gender: Male Female

2. Ethnicity: African-American

Asian-American

Caucasian

Latino/Hispanic

Middle-Eastern

Other (please describe): _____

Age: _____

Highest Level of Education Completed Less than Diploma

Diploma

Some College

Associates

Bachelors

Advanced Degree (e.g. Masters, J.D. M.D., Ph.D)

APPENDIX G

DEBRIEFING FORM, STUDY 1

Debriefing, Study 1

The experiment is over. Your submission will be reviewed within 48 hours.

This study measured your scores on grit, information about which can be found here:

http://www.ted.com/talks/angela_lee_duckworth_the_key_to_success_grit?language=en

APPENDIX H
CONSENT FORM, STUDY 2

Consent Form, Study 2

I agree to participate in the research project titled “Predicting Career Success,” conducted by Robert Pulvermacher, a graduate student at Northern Illinois University and Dr. Amanda Durik, a faculty member at Northern Illinois University. I have been informed that the purpose of the study is to better understand how individuals who are more and less likely to succeed in their careers are likely to communicate with one another.

I understand that if I agree to participate in the study, I will be asked to do the following: answer a series of questionnaires, and then work on a task related to my goals. I further understand that any information I provide as part of this research will be kept confidential. I am aware my participation is voluntary and may be withdrawn at any time without penalty or prejudice, and that if I have any additional questions regarding this study, I may contact Robert Pulvermacher (pulvermacher111@yahoo.com). I understand that if I wish further information regarding my rights as a research subject, I may contact the Office of Research Compliance at Northern Illinois University at (815) 756-8588. I understand the primary benefit to me in taking part in this study is in making a contribution to scientific knowledge. I will be paid \$2.00 for participating.

The study will take 30-45 minutes. I understand that my consent to participate in this study does not constitute a waiver of any legal rights or redress I might have as a result of my participation, and I acknowledge that I have read this consent form. I have read and understand the above information.

I am at least 18 years of age and agree to participate in this (please click below)

APPENDIX I

SAMPLE TASK, 3-LETTER ANAGRAM EXAMPLE

Sample Task, 3-Letter Anagram Example

The letters are:

I G G

What work-related word can these letters be used to create?

APPENDIX J

BEHAVIORAL IDENTIFICATION FORM

Behavioral Identification Form

Any behavior can be described in many ways. For example, one person might describe a behavior as "writing a paper," while another person might describe the same behavior as "pushing keys on the keyboard." Yet another person might describe it as "expressing thoughts." This form focuses on your personal preferences for how a number of different behaviors should be described. Below you will find several behaviors listed. After each behavior will be two different ways in which the behavior might be identified. For example:

1. Attending class
 - a. sitting in a chair
 - b. looking at a teacher

Your task is to choose the identification, *a* or *b*, that best describes the behavior for you. Simply place a checkmark next to the option you prefer. Be sure to respond to every item. Please mark only one alternative for each pair. Remember, mark the description that *you personally believe* is more appropriate for each pair.

1. Making a list
a. Getting organized
b. Writing things down
2. Reading
a. Following lines of print
b. Gaining knowledge
3. Joining the Army
a. Helping the Nation's defense
b. Signing up
4. Washing clothes
a. Removing odors from clothes
b. Putting clothes into the machine
5. Picking an apple
a. Getting something to eat
b. Pulling an apple off a branch

6. Chopping down a tree
a. Wielding an axe
b. Getting firewood
7. Measuring a room for carpeting
a. Getting ready to remodel
b. Using a yard stick
8. Cleaning the house
a. Showing one's cleanliness
b. Vacuuming the floor
9. Painting a room
a. Applying brush strokes
b. Making the room look fresh
10. Paying the rent
a. Maintaining a place to live
b. Writing a check
11. Caring for houseplants
a. Watering plants
b. Making the room look nice
12. Locking a door
a. Putting a key in the lock
b. Securing the house
13. Voting
a. Influencing the election
b. Marking a ballot
14. Climbing a tree
a. Getting a good view
b. Holding on to branches

15. Filling out a personality test
a. Answering questions
b. Revealing what you're like
16. Toothbrushing
a. Preventing tooth decay
b. Moving a brush around in one's mouth
17. Taking a test
a. Answering questions
b. Showing one's knowledge
18. Greeting someone
a. Saying hello
b. Showing friendliness
19. Resisting temptation
a. Saying "no"
b. Showing moral courage
20. Eating
a. Getting nutrition
b. Chewing and swallowing
21. Growing a garden
a. Planting seeds
b. Getting fresh vegetables
22. Traveling by car
a. Following a map
b. Seeing countryside
23. Having a cavity filled
a. Protecting your teeth
b. Going to the dentist

24. Talking to a child
a. Teaching a child something
b. Using simple words
25. Pushing a doorbell
a. Moving a finger
b. Seeing if someone's home

APPENDIX K
DEBRIEFING FORM, STUDY 2

Debriefing Form, Study 2

I am interested in how people stay motivated to complete tasks, and how taking a big-picture look at tasks, as opposed to a more concrete look at tasks, can change how you work on a task. Your submission will be reviewed within 48 hours.

IMPORTANT: your performance on the anagram task is not actually related to your ability to accomplish your career goals. You were told this so that you would take the task seriously, but there is no actual connection. **ALSO**, there may have been anagrams that were not solvable within the sets. These were included so I could measure how your level of grit measured your willingness to keep working on them and other anagrams.

This study measured how your scores on grit predicted your performance on the anagram task. Research shows that gritty people may be more able to deal with obstacles to important goals, and this study is attempting to measure that effect. If you have any questions, please contact Robert Pulvermacher at pulvermacher111@gmail.com.