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Developing and Validating the Agentic Willpower Scale: Its Role in Well-being, Distress, and Academic Success

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Abstract. Willpower has long been studied in Psychology but the focus has predominantly been on self-control. We propose that there is an important aspect of willpower that incorporates human agency, which has largely been overlooked. Our conceptualization sees "agentic willpower" as being derived from an internal locus of control, self-efficacy, grit, and resilience. In Study 1 (n=210), an exploratory and confirmatory factor analysis showed that these variables loaded on a common factor and the model fit the data well. Factor scores were related to older age, higher income, lower anxiety symptoms, lower depressive symptoms, less stress, higher life satisfaction, and greater happiness. Study 2 (n=179) was mostly centered on developing a new measure for the construct, the Agentic Willpower Scale (AWS). The scale demonstrated relatively high internal consistency and was strongly correlated with the factor that had been obtained in study 1. Scores on the AWS were significantly correlated with higher extraversion, conscientiousness, emotional stability, and lower boredom proneness. In study 3 (n=109), agentic willpower scores predicted Grade Point Average in a sample of undergraduate students at the conclusion of the semester. Taken together, the studies suggest that the construct may play an important role in mood, psychological well-being, and performance.

Keywords: Willpower, Locus of Control, Self-efficacy, Grit, Resilience

Introduction

Philosophers from the medieval era to the Victorian era grappled with the concept of the will and whether our actions were truly free or predetermined. The debate was deeply intertwined with moral considerations; after all, we would not be able to credibly find someone responsible for their sins if their actions had been predetermined or were outside of their control. Despite these varying views, there has been a common belief among philosophers that the will is a faculty of mind that works with the intellect to select various courses of action, even if the nature of that faculty and the freedom to make choices has spawned disagreements. Further, the will has motivational properties as it drives us towards certain goals or objectives.

The term "willpower" arose in the 19th century, and though it was derived from the "will" and "power," it has since become synonymous with self-control. Therefore, in contrast to earlier notions of the will, which involved actively pursuing certain courses of action, "willpower," in the modern sense, has more to do with *not* acting on our desires. Indeed, as far back as 1899, William James made the argument that a central aspect of the will was the ability to inhibit certain actions (i.e. self-control). However, James also argued that there was another type of will, the impulsive will, which precipitated action. Although this agentic aspect has largely been overlooked in modern psychological research into willpower, we feel that it is an integral aspect of the concept, and, furthermore, meshes to a greater extent with lay conceptions of "strong willed" individuals (i.e. "go-getters," "fighters," etc.). It could be argued that there has been a research gap when examining willpower and it stands to reason that this agentic component could be meaningfully related to a number of educational and mental health outcomes, which we sought to test in a series of studies.

In the following paragraphs, we outline the self-control aspect of willpower before turning to the concept of agency. We will also cover some of the key variables that we believe to be components of a construct which we have dubbed "agentic willpower," namely internal locus of control, self-efficacy, grit, and resilience. One goal of the present paper was to operationalize the construct and develop a measure for future research. Another goal was to examine agentic willpower in relation to psychological distress, well-being, personality, and other important outcomes (i.e. income, education level, and GPA).

Self-Control and Resource Theories of Willpower

Perhaps the most well-known studies on self-control were conducted by Walter Mischel, starting in the 1970s, and have come to be known as the "Stanford marshmallow experiment." Mischel et al. (1972) presented children with the option of two treats (marshmallow or pretzel) and asked the children to choose their favorite. Next, the experimenter told them that he had to leave but if they could wait 15 minutes he would be back to give them their preferred choice; otherwise, they could ring him at

any time and eat the non-preferred treat. The experiment was therefore a test of delay of gratification and self-control. Remarkably, a series of follow up studies showed that the children who had chosen to delay gratification (i.e. exhibited greater self-control) had higher SAT scores (Mischel et al., 1989), academic competence (Shoda et al., 1990) and even higher levels of pre-frontal cortex activity 40 years after the original study (Casey et al., 2011).

Resource theories of willpower focus on a process, self-control, which is viewed as a limited resource. When depleted, this resource needs to be restored. The ego-depletion model has resonated with many probably because of: 1) its parsimony; 2) its connection to our everyday experience, i.e., cars running out of gas/filling up the tank; and 3) it provides us with a quick solution for our waning self-control (replenish the depleted resource).

Agency

Wiggins (1991) has traced the concepts of agency and communion through the works of various philosophers and social scientists, and views them as being pivotal to understanding human interpersonal behavior. Wiggins (1991), defined agency as "being a differentiated individual, and it is manifest in strivings for mastery and power which enhance and protect that differentiation." Agency plays a prominent role in the interpersonal circumplex model, developed by Leary (1957) and Wiggins (1979), which holds that all interpersonal behavior falls somewhere in a circular space drawn around two dimensions or axes: warm-cold (i.e. communion) and dominance-submission (i.e. agency).

In offering a social cognitive view of agency, Bandura (2006) suggests that people are more than by-standers to their own existence. Instead, a person uses their agency to influence their circumstance and experiences. In regards to agentic willpower, Bandura's viewpoint lends support to the idea that individuals who, "develop their competencies, self-regulatory skills and enabling beliefs in their efficacy can generate a wider array of options that expand their freedom of action, and are more successful in realizing desired futures, than those with less developed agentic resources" (Bandura, 2006). Below, we describe various aspects of the new construct as well as our rationale for including each component.

Locus of Control

In 1966, Rotter outlined a construct that has since been examined in thousands of studies. Rotter argued that some individuals expect to have control over reinforcement, whereas others believe that reinforcement depends on luck or fate. Those with the former style have come to be known as having an internal locus of control, believing that they are in control of their destiny and that their efforts will pay off. Those with the latter style are known as having an external locus of control and feel like they have little influence over the course of their life.

We would argue that those with an internal locus of control will demonstrate higher levels of agency, as they believe that their efforts towards their goals will bear fruit. Indeed, there are many lines of evidence to support this notion as greater internality is associated with: academic performance (Shepherd et al., 2006); job performance, organizational level, salary, and commitment (Wang et al., 2010); and health behaviors (Norman et al., 1998) among other important life outcomes. In terms of agentic willpower, internality would represent an evaluative-cognitive component, which, in turn, leads to action through operation of the will.

Self-Efficacy

Another evaluative-cognitive component of agentic willpower would be self-efficacy, a construct developed by Bandura (1977), which pertains to beliefs about one's ability to bring about desired outcomes. Self-efficacy has often been viewed as a general feeling of competence. There are many studies that link self-efficacy to higher levels of agency. For example, people who are high in self-efficacy are more likely to try and complete tasks and tend to persist longer on tasks (Schunk, 1990). Thus, persistence is more likely to meet with success, which, in turn, feeds back into higher self-efficacy (Bandura, 1977). This process represents an adaptive cycle of success begetting success (Sloman, Sturman, & Price, 2011). In a meta-analysis, Stajkovic and Luthans (1998) found that self-efficacy showed a robust relationship to work performance and a number of work-related tasks and skills. Like locus of control, self-efficacy comprises a series of beliefs or expectations about the likelihood of success for a given course of action and, thus, both may be seen as more of a cognitive precursor to willful action.

Grit

Grit is a construct that was popularized by Duckworth et al. (2007) who defined it as: 1) perseverance in the face of obstacles; and 2) passion for long-term goals (i.e. maintaining consistency of interest). The concept was particularly popular among educators who saw the potential to bolster a key non-cognitive trait in the hopes of improving performance. Notably, only the perseverance component is able to predict performance over and above conscientiousness (see a meta-analysis by Credé et al., 2017) and consistency of interest tends to have weak correlations with performance. Therefore, we used the definition and measure developed by Sturman and Zappala-Piemme (2017) in the current research, which emphasizes a sustained and focused effort on tasks as well as overcoming setbacks. Grit therefore represents a different, albeit related, aspect of agentic willpower, insofar as it involves direct, long-term efforts towards attaining one's goals.

Resilience

Of all the components thought to underlie agentic willpower, resilience has the most varied formulations amongst researchers and

theorists, with some seeing it as a dynamic concept (e.g. Rutter, 2012) and others conceptualizing it as a personality trait. We used the Smith et al. (2008) definition of resilience in the current study which is more circumscribed and straightforward: resilience is "the ability to bounce back or recover from stress." We view this ability as a crucial aspect of agentic willpower, insofar as stress inevitably accompanies the pursuit of meaningful goals.

Inter-relationships between the Constructs

Numerous studies have examined the relationships between the constructs described above but, to our knowledge, none have included all of them simultaneously or sought to investigate a common factor underlying them. For example, Luthans et al. (2019) found that psychological capital (PsyCap, which includes self-efficacy, resilience, optimism, and hope) mediated the link between grit and academic performance. Denovan et al. (2023), similar to the goals of this study, sought to examine whether mental toughness, grit, self-efficacy, and ego resiliency shared a common factor. The researchers established a construct that included mental toughness, self-efficacy and optimal regulation, but not grit.

It should also be noted that recent research into these traits will have been conducted in the Covid pandemic era, which could have several effects. Terry et al. (2023) found that grit and resilience (but not self-efficacy or other aspects of psychological capital) dipped in 2020 among nursing students. On the other hand, traits like grit, resilience, and PsyCap may also predict academic outcomes in the face of such stress. For example, Lytle and Shin (2023) found that students with higher levels of grit and resilience were more likely to stay on track in their academic career. Other researchers have confirmed that grit was related to various aspects of well-being during the pandemic (Bono et al. 2020; Datu et al. 2021). Ravikumar (2023) found that health care workers with higher psychological capital (which incorporates self-efficacy and resilience) were better able to withstand occupational stress during the pandemic and had higher psychological well-being

A Definition of Agentic Willpower

Bringing together the various elements, we can define agentic willpower as follows: The belief that one has control over, and can achieve, important outcomes, coupled with a determination to persevere through setbacks and stressors. We see agentic willpower as a trait but acknowledge that there will certainly be some variation across time and different situations in how well any individual can bring about desired outcomes or bounce back from stressors.

The objectives of study 1 was to determine whether widely studied personality variables (grit, locus of control, self-efficacy, and resilience) were all essentially tapping an underlying factor that embodies agency and willpower. If so, we sought to explore the relationships between this

underlying factor and a number of outcomes. The goal for study 2 was to operationalize this factor into an easy-to-use questionnaire and validate the new measure, while simultaneously expanding our knowledge of the relationship between the new construct and various outcomes (i.e. mood, well-being, and personality). Study 3 was geared towards evaluating the ability of the new measure to predict academic performance at the university level.

Study 1

The first study was primarily geared towards determining whether grit, locus of control, self-efficacy, and resilience would load on a common factor, as anticipated, and whether that factor would, in turn, predict a number of outcomes related to psychological well-being and psychopathology. We expected a single factor to predominate and also expected relatively high factor loadings for the aforementioned variables, if, indeed, they were indicators of agentic willpower.

Factor scores were obtained from the factor analysis with higher scores presumably indicating higher levels of agentic willpower. In other words, the factor scores became another variable in the dataset, representing agentic willpower, which we could enter into various statistical analyses. By computing factor scores we were able to determine how agentic willpower related to a number of outcomes, both positive and negative.

Life satisfaction and happiness were included in the analysis, as two of the more widely studied variables arising from the "Positive Psychology" movement. Agentic willpower was also examined in relation to perceived stress, generalized anxiety, and depressive symptoms.

The specific hypotheses for the study were as follows:

1) An exploratory factor analysis would reveal a single factor solution, with adequate factor loadings (i.e. higher than .40) for locus of control, grit, self-efficacy, and resilience;
2) A confirmatory factor analysis would show that the theoretical model fits the actual data.
3) Factor scores, which we interpret as a measure of agentic willpower, would be significantly correlated with higher levels of happiness and life satisfaction;
4) Agentic willpower would be significantly correlated with lower anxiety, lower depressive symptoms, and lower perceived stress. We anticipated these relationships as locus of control, grit, and resilience tend to be moderately negatively correlated with symptoms of psychopathology (e.g. see Ahmed & Julius, 2015;.Hovenkamp-Hermelink et al., 2019; and Tuckwiller & Dardick, 2018).

Methods

Participants and Procedure

Students in undergraduate psychology courses were given course credit for their participation and they had the opportunity to earn extra credit for enlisting the participation of three family members/friends of various ages. In this manner, we hoped to get a relatively representative sample from the community. Additionally, a link to the survey was posted on Facebook and research assistants also sent it out to friends. All participants provided informed consent and the measures were completed online using Survey Monkey. This was the case for all 3 studies. The data for all three studies and a pilot study (see Note 1) (labelled Will Study Time 1 in OSF) can be obtained at https://osf.io/q4ea9/.

A total of 210 participants (152 female, 57 male, 1 non-binary) with a mean age of 37.65 (SD=14.16) completed the measures on Survey Monkey. Table 1 provides demographic data including ethnicity, education levels, and income. We should note that there was a high number of White participants in the study, largely owing to geographic location, and a disproportionate number of participants who had a Master's degree, which may owe to the recruitment methods.

Table 1. *Demographic Data for Study 1.*

Ethnicity						
	White	Black	Hispanic	Asian	Multiple	
	200 (95.7%)	1 (.5%)	4 (1.9%)	1 (.5%)	3 (1.4%)	
Education						
	Highschool or lower	Associates	Bachelor's	Master's	Doctorate	Other
	56 (26.7%)	40 (19%)	35 (16.7%)	65 (31%)	1 (.5%)	13 (6.2%)
Income						
	Less than 15,000	15,000 – 29,000	30,000 – 44,000	45,000 – 59,000	60,000 – 74,000	75,000 +
	39 (18.7%)	25 (12%)	35 (16.7%)	34 (16.3%)	22 (10.5%)	54 (25.9%)

Measures

Demographics

All participants provided basic demographic data, which included age, gender, ethnicity, education level, and income level. Self-reported income was assessed with a scale that increased in $15,000 increments (e.g. $0-$15,000, $16,000-$30,000, etc.). The scale progressed in this manner up to a $120,000 + option. We consolidated all levels above $75,000 into a $75,000+ category due to low numbers of participants at the higher income levels.

Internal Control Index (ICI; Duttweiler, 1984)

The Internal Control Index is an assessment of locus of control in which higher scores reflect more of an internal locus of control. It is comprised of 28 items with response options ranging from rarely (less than 10% of the time) to usually (90%+). Duttweiler (1984) found the ICI to possess acceptable reliability and convergent validity. Jacobs (1993) also found the scale to be psychometrically sound.

Grit Scale for Children and Adults (GSCA; Sturman & Zappala-Piemme, 2017)

The GSCA is a 12-item scale which assesses grit levels in children and adults. The authors defined grit as persistent focus on a task and one's ability to overcome difficulties. The GSCA employs a Likert scale with responses ranging from 1=Strongly Disagree to 5=Strongly Agree. Examples of items include "I never give up even when things get tough" and "I always finish what I start." The GSCA demonstrated high test-retest reliability as well as internal consistency in a sample of school aged children ranging from grades three to twelve. The scale was also a significant predictor of standardized test performance in the subjects of English, math, and science (Sturman & Zappala-Piemme, 2017).

Brief Resilience Scale (BRS; Smith et al., 2008)

The Brief Resilience Scale consists of 6 items tapping one's resilience. A 5-point scale is used with responses ranging from 1=Strongly Disagree to 5=Strongly Agree. BRS scores are calculated by averaging across all items. The BRS was utilized as it is brief and evaluates the construct of resilience itself, rather than its constituent components. Smith et al. (2008) found that the scale loads on a single dimension, according to a factor analysis, and displayed high internal consistency. BRS scores were also indicative of one's ability to "bounce back," apparent in coping and health-related outcomes.

New General Self-Efficacy Scale (NGSES, Chen et al., 1999)

The NGSES consists of 8 items to assess general self-efficacy (i.e. an individual's belief in his/her competence across a variety of situations). Respondents are rated on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly disagree. Item examples include "Even when things are tough, I can perform quite well" and "Compared to other people, I can do most tasks very well." In the validation of the NGSES, Chen et al. (1999) found the instrument to have high test-retest reliability. Additionally, through a test of content validity, it was found that the NGSES was significantly more consistent with the construct of self-efficacy than its predecessor, the SGSES.

Center for Epidemiological Studies Depression Scale (CESD; Radloff, 1977)

The CESD was developed to provide a gauge of depressive symptoms in the general population with scores ranging from zero to sixty. The measure is made up of 20 items, representing various depressive symptoms. Responses are made on a 4-point scale ranging from 0=rarely or none of the time – less than one day (per week), to 3=most or all of the time – five to seven days (per week). The CESD has been shown to have adequate internal consistency in both the general population as well as clinical samples (Radloff, 1977). There is also evidence for the convergent validity of the CESD as it was significantly associated with other measures of depression (Radloff, 1977).

Generalized Anxiety Disorder 7-item Scale (GAD-7; Spitzer et al., 2006)

The GAD-7 is a 7-item measure to assess the severity of generalized anxiety symptoms. Respondents rate the persistence of symptoms ranging from 0=not at all to 3=nearly every day. In assessing the validity of the measure, Spitzer at al. (2006) found it to possess high internal consistency and test-retest reliability. The GAD-7 demonstrated its utility as a screening tool for generalized anxiety disorder. Severity of symptoms were related to impaired functioning across a variety of domains (Spitzer et al., 2007).

Satisfaction with Life Scale (SWLS; Diener et al., 1985)

The SWLS is a 5-item measure which draws upon judgments of life satisfaction. Respondents are tasked with rating their feelings of satisfaction on a 7-point Likert scale ranging from 1=strongly disagree to 7=strongly agree. Diener et al. (1985) found the measure to be associated with various criteria of well-being as well as the ability to adjust to various circumstances. He also reported that the SWLS possesses good internal consistency and test-retest reliability.

Perceived Stress Scale (PSS; Cohen & Williamson, 1988)

The PSS consists of 10 items measuring perceptions of stress. Respondents are prompted to report the frequency at which they experienced stress in the past month on a 5-point scale ranging from 0=never to 4=very often. Cohen and Williamson (1988) reported that the scale was significantly correlated with various measures of stress and health behaviors. The PSS also demonstrated good internal consistency (Cohen & Williamson, 1988).

Subjective Happiness Scale (Lyubomirsky & Lepper, 1999)

The Subjective Happiness Scale contains 4 items pertaining to happiness. Items are rated on a 7-point Likert scale ranging from 1=not a very happy person to 7=a very happy person. Happiness scores are derived from the mean of all items. Lyubomirsky and Lepper (1999) reported high levels of internal consistency as well as test-retest reliability. Scores on the

Subjective Happiness Scale were related to several other measures of happiness, indicative of its convergent validity. Additionally, collected informant ratings were significantly correlated with those of respondent's self-ratings.

Data Analytic Strategy for Exploratory and Confirmatory Factor Analysis

An exploratory factor analysis with locus of control, self-efficacy, grit, and resilience was conducted using Principal Axis Factoring (PAF). The factor analysis also enabled us to calculate factor scores for the latent variable, which could be entered into various statistical analyses. Subsequently, a Confirmatory Factor Analysis (CFA) was conducted to determine how well the model fit the data. Several statistics were used to assess the goodness of fit of the confirmatory factor analysis. The comparative fit index (*CFI*), goodness-of-fit index (*GFI*), Bentler-Bonett Normed Fit Index (*NFI*), and Root Mean Square Error of Approximation (RMSEA) were used to assess the fit of the model. The most commonly used standards for these statistics are *CFI*, *GFI,* and *NFI* values above .95 (Hu & Bentler, 1999; Miles and Shevlin, 1998). For RMSEA, values below .05 are considered an excellent fit, values between .05 and .08 are considered good, and values from .08 to .10 may be adequate or mediocre (MacCallum, Browne, & Sugawara, 1996). We also evaluated the Average Variance Extracted (AVE), which explains the variance in the indicator variables that is accounted for by the latent variable and the Composite Reliability (CR), a measure of internal consistency for the indicator variables

Results

Exploratory Factor Analysis

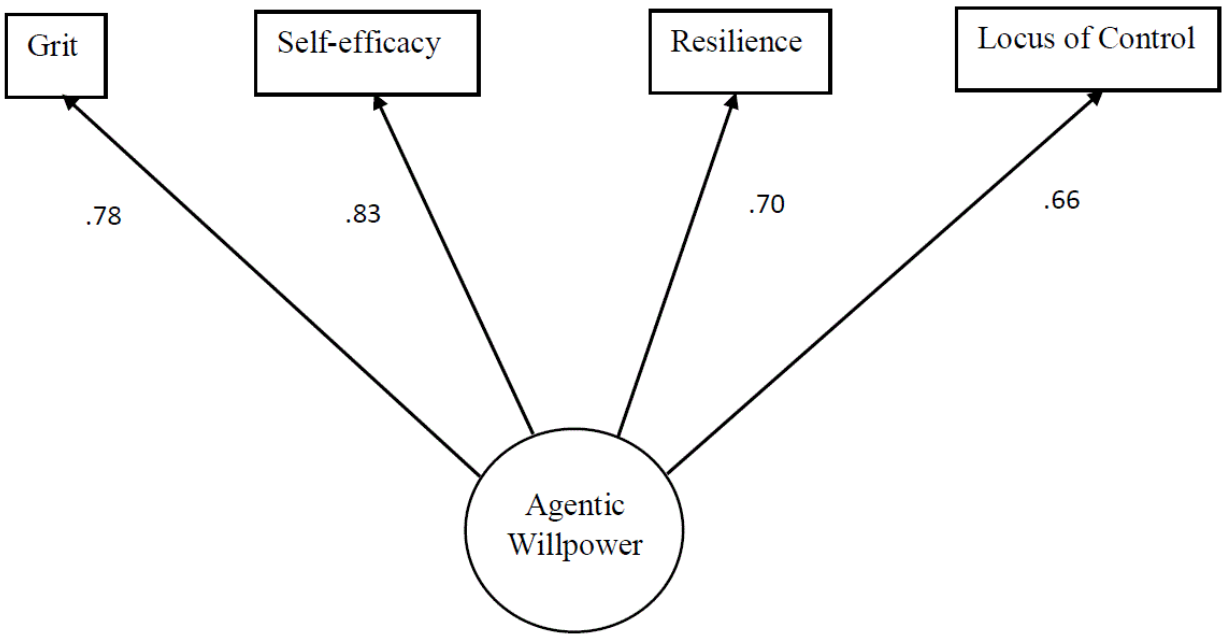
The Kaiser-Meyer-Olkin measure of sampling adequacy was .80 (above the recommended value of .6), and Bartlett's test of sphericity was significant [$\chi 2$ (6) = 273.65, p=.001]. The factor analysis revealed only one factor with an eigenvalue over 1 and the scree plot confirmed that only one factor was predominant. The factor accounted for 66.28% of the variance. The factor loadings for each variable were as follows: locus of control=.65; self-efficacy=.84; grit=.79; and resilience=.69. A principal components analysis (PCA) was conducted and the Bartlett method was used to create factor scores for each participant.

Confirmatory Factor Analysis

As can be seen in Figure 1, the path coefficients between the latent variable (i.e. agentic willpower) and the indicator variables were relatively high, ranging from .66 (locus of control) to .83 (self-efficacy). All of the fit indices showed that the hypothesized model fit the data very well. The specific values were as follows: CFI=.998; GFI=.993; NFI=.991; and RMSEA=.038.

The Average Variance Extracted (AVE) was .556, which is generally considered as acceptable (greater than .5). The Composite Reliability (CR) was .833, which is also considered acceptable (greater than .7).

Fig. 1. Confirmatory Factor Analysis: Agentic Willpower



Demographics and Group Differences

There was a significant difference between males and females on agentic willpower scores. Mean scores for males were .28 (SD=.96) and mean scores for females were -.11 [SD=1.00; t(183)=-2.41, p=.017)]. There was a significant correlation between age and agentic willpower such that scores increased with age (r=.19, p=.008), although the correlation was modest. There was no significant difference on agentic willpower owing to ethnicity (p=.372). There was a trend towards higher agentic willpower with higher education but the differences between education levels were not statistically significant [F(4, 181)=1.93, p=.108)].

An ANOVA revealed a significant effect of income levels on agentic willpower [F(5, 180)=3.68, p=.003]. Agentic willpower scores increased in a fairly linear fashion with higher income levels. Post-hoc LSD tests revealed that those with self-reported incomes below $15,000 scored significantly lower on agentic willpower compared to those with incomes of $30,000 to $45,000 (p=.043), $45,000 to $59,000 (p=.001), and $75,000 or over (p=.001).

Correlations with Key Variables

Agentic willpower scores were significantly correlated with all of the key variables in the study (see Table 2). The correlations tended to be in the moderate to strong range. Agentic willpower was significantly

negatively correlated with depressive symptoms, generalized anxiety, and stress such that higher willpower was linked to lower scores on these outcomes. Agentic willpower was significantly positively correlated with higher levels of life satisfaction and happiness.

Table 2. *Correlations between Study Variables and Descriptive Statistics*

	1.	2.	3.	4.	5.	Mean	SD
1. Agentic willpower						0	1.00
2. Depressive symptoms	-.63*					17.55	11.72
3. Generalized anxiety	-.52*	.84*				6.81	5.58
4. Perceived stress	-.62*	.84*	.77*			17.77	6.31
5. Life satisfaction	.46*	-.52*	-.43*	-.51*		23.96	7.14
6. Happiness	.62*	-.65*	-.53*	-.60*	.64*	4.91	1.26

*. Correlation significant at p=.001.

Discussion

The first step in the analysis was to determine whether locus of control, grit, and resilience would load on a common factor. The factor analysis produced a one-factor solution and all of the indicator variables loaded on the factor at a high level. The confirmatory analysis demonstrated that the proposed model fit the data well.

We obtained a significant relationship between agentic willpower and income such that higher income levels were linked to higher willpower scores. Agentic willpower increased with age, as might be expected if people come to realize that their efforts will pay dividends over time. Males scored significantly higher but we were not sure what to make of this finding as there were no gender differences in the pilot study, and, as will be seen, no gender differences in studies 3 and 4. Therefore, the finding may have been an anomaly.

Agentic willpower scores were significantly correlated with psychopathology and positive outcomes in the manner expected. Specifically, they were related to lower depressive symptoms, lower anxiety, and lower perceived stress. Agentic willpower was also related to higher life satisfaction and greater happiness. Thus, people exhibiting this quality are likely to experience a number of psychological benefits and seem to be less vulnerable to psychopathology.

Study 2

Having established that there is a common factor underlying locus of control, self-efficacy, grit, and resilience, we next sought to operationalize this construct (which we call agentic willpower) in the form of a questionnaire. Study 2 was primarily geared towards testing the psychometric properties of the Agentic Willpower Scale (AWS; see Appendix A). We further hoped to determine whether scores on the scale would correlate highly with the same factor that had been obtained in study 1. Also, we sought to examine how agentic willpower relates to personality, specifically the Big-5 personality traits and boredom proneness.

Of the Big-5 traits, we expected individuals higher in extraversion to have higher agentic willpower, as extroverted individuals tend to be more outgoing and dominant, which reflects greater agency. Conscientiousness, which includes facets such as reliability and industriousness was likewise expected to correlate with agentic willpower. In contrast, the emotional instability exhibited by highly neurotic individuals should, theoretically, hinder agency.

We examined boredom proneness as we viewed this construct as running counter to agency and thus, we expected a negative correlation with agentic willpower. There is some evidence that boredom proneness is related to lower persistence and poor impulse control (Leong and Schneller, 1993). The specific hypotheses for study 2 were as follows:

1) Factor scores derived from grit, locus of control, resilience, and self-efficacy would be significantly and strongly correlated with scores on the AWS.
2) Scores on the AWS would be associated with older age and higher income levels.
3) Scores on the AWS would be significantly positively correlated with extraversion, conscientiousness, and emotional stability (i.e. the opposite of neuroticism).
4) Scores on the AWS would be significantly negative correlated with boredom proneness.

Methods

Participants and Procedure

Participants were recruited in a similar manner as study 1. Students at a 4-year college and a 2-year college, in upstate New York, were awarded course credit for their participation and were given bonus credit for enlisting family and friends. Again, this procedure was utilized to obtain a more representative sample. The gender breakdown was not representative of the population as the sample had 69 males (38.5%) and 110 females (61.5%). The average age was 35.46 (SD=16.37), indicating that the sample was not primarily composed of students. Other participant characteristics, including ethnicity, education, and income can be found in Table 3.

Table 3. *Demographic Data for Study 2*

Ethnicity						
	White	Black	Hispanic	Asian	Multiple	
	157 (87.7%)	6 (3.4%)	5 (2.8%)		11 (6.1%)	
Education						
	Highschool or lower	Associates	Bachelor's	Master's	Doctorate	Other
	75 (41.9%)	43 (24%)	28 (15.6%)	17 (9.5%)	1 (.6%)	15 (8.4%)
Income						
	Less than 15,000	15,000 – 29,000	30,000 – 44,000	45,000 – 59,000	60,000 – 74,000	75,000 +
	48 (28.1%)	36 (21.1%)	18 (10.5%)	17 (9.9%)	12 (7%)	40 (23.3%)

Measures

The Agentic Willpower Scale (AWS)

The AWS was developed by looking at item-total correlations from the first study on the Internal Control Index (ICI; Duttweiler, 1984), New General Self-Efficacy Scale (NGSES; Chen et al., 1999), Grit Scale for Children and Adults (GSCA; Sturman & Zappala-Piemme, 2017), and Brief Resilience Scale (BRS; Smith et al., 2008). The four items with the highest correlations with the total score, from each scale, were examined and served as the inspiration for new items that attempted to capture the same meaning. For example, an item from the GSCA (grit) that dealt with perseverance on tasks was re-worded but the focus of the new item was still on task completion. In some cases, completely new items were created with no relation to the aforementioned scales but which captured a central aspect of the construct. In this manner, we sought to develop a scale that was as conceptually close to each component of Agentic Willpower as possible. As in study 1, we obtained factor scores after performing a factor analysis with grit, locus of control, self-efficacy, and resilience as the indicator variables. It was encouraging that the factor scores correlated highly with AWS scores, suggesting that the AWS was measuring the same latent variable that we had examined in study 1. We elaborate further on these findings in the Results. Three items were created for each component for a total of 12 items. The final version of the scale can be found in Appendix A.

Ten-Item Personality Inventory (TIPI; Gosling et al., 2003)

The TIPI is a measure of the Big Five Personality dimensions: openness, conscientiousness, extraversion, agreeableness and emotional stability. The scale consists of 10 items rated on 7-point Likert scale with responses ranging from 1 (strongly disagree) to 7 (strongly agree). Respondents are presented with short prompts that draw upon the Big Five Personality dimensions: for example, the degree to which they see

themselves as "Extraverted, enthusiastic" or "Calm, emotionally stable". Gosling et al. (2003) found the TIPI to have good convergent validity as it was related to other widely used big five measures. The scale was also found to have adequate test-retest reliability.

The Short Boredom Proneness Scale (BPS-SR; Struk et al., 2017)

The Short Boredom Proneness Scale is an abbreviated version of the original Boredom Proneness Scale. The scale seeks to measure one's propensity for experiencing boredom. The BPS-SR consists of eight items rated along a seven-point scale with possible responses ranging from 1=strongly disagree to 7=strongly agree. BPS-SR sample items include "I find it hard to entertain myself" and "I don't feel motivated by most things that I do". In the validation of the scale Struk et al. (2017) obtained a Cronbach's alpha value of 0.88, demonstrating high internal consistency of the BPS-SR. The BPS-SR was related to depression, anxiety, stress, and ADHD symptoms, lending support for its construct validity.

The GSCA (Sturman & Zappala-Piemme, 2017), ICI (Duttweiler, 1984), BRS (Smith et al., 2008), and NGSES (Chen et al., 1999) were administered in order to obtain factor scores, which could be compared to scores on the newly developed Agentic Willpower Scale. See study 1 for descriptions of the measures.

Results

Exploratory Factor Analysis

As in the previous study, a factor analysis was conducted with locus of control, self-efficacy, grit, and resilience. The Kaiser-Meyer-Olkin measure of sampling adequacy was .79 (above the recommended value of .6), and Bartlett's test of sphericity was significant [$\chi 2$ (6) = 259.30, p=.001]. A single factor solution was obtained as only one factor had an eigenvalue greater than 1. This factor accounted for 66.30% of the variance. The factor loadings were as follows: locus of control=.63, self-efficacy=.82, grit=.84, and resilience=.68. Consistent with the previous study, a principal components analysis (PCA) was conducted and the Bartlett method was used to create factor scores for each participant. We calculated factor scores to determine whether the latent variable was significantly correlated with scores on the AWS.

Internal Consistency of the AWS

The Cronbach's alpha for the AWS was .81, demonstrating adequate internal consistency. A further analysis revealed that the internal consistency of the measure (as measured by Cronbach's alpha) would not be improved by omitting any of the items.

Correlation between Factor Scores and AWS Scores

The correlation between factor scores (derived from the EFA – see above) and the AWS was .84 (p=.001), which is indicative of a very strong

correlation. The correlation was sufficiently high that we could presume the AWS was essentially tapping the same latent variable (agentic willpower) that had been obtained in the previous studies. For the subsequent analyses, AWS scores were used to compare agentic willpower to other key variables, rather than factor scores.

Demographics and Group Differences

There were no significant differences between males and females on the AWS with males having a mean score of 44.52 (SD=7.36) and females having a mean score of 43.12 (SD=5.60; p=.151). There was a significant correlation between age and scores on the AWS, such that scores increased with age (r=.29, p=.001). There was no significant difference on agentic willpower owing to ethnicity (p=.246). Education levels did not show a significant effect on AWS scores [f(5)=1.01, p=.416]. As in the previous study there was a significant effect of income levels on agentic willpower [F(5)=4.27, p=.001). Post hoc LSD tests showed that those making less than $15,000 had significantly lower agentic willpower scores compared to those making $45,000 to $59,000 (p=.029), $60,000 to $74,000 (p=.040), and $75,000 or over (p=.001). Those making over $75,000 had significantly higher agentic willpower compared to those making $15,000 to $29,000 (p=.007), and those making $30,000 to $44,000 (p=.003).

Correlations between AWS Scores and Key Variables

Correlations between agentic willpower, the Big-5 personality variables, and boredom proneness can be found in Table 4. Although we did not have any predictions related to openness to experience, it is noteworthy that individuals high in this characteristic had higher agentic willpower scores. As hypothesized, agentic willpower was significantly positively correlated with extraversion, conscientiousness, and emotional stability such that individuals who scored high on these traits, also scored higher on the AWS. Most of the correlations were in the moderate to strong range. AWS scores showed a relatively strong negative correlation with boredom proneness. Therefore, those scoring high on agentic willpower were more likely to be emotionally stable and less prone to boredom.

Table 4. *Correlations between Study Variables and Descriptive Statistics*

	1.	2.	3.	4.	5.	6.	Mean	SD
1. Agentic Willpower							43.66	6.35
2. Openness to Experience	.32**						5.17	1.19
3. Conscientiousness	.45**	.18*					5.47	1.27
4. Extraversion	.32**	.46**	.07				4.04	1.76
5. Agreeableness	.00	-.01	.09	-.14			5.06	1.01
6. Emotional Stability	.66**	.22*	.30**	.17*	.03		4.46	1.50
7. Boredom Proneness	-.63**	-.25**	-.42**	-.37**	-.01	-.52**	23.94	11.11

Note. * Correlation significant at p=.05. ** Correlation significant at p=.001

Discussion

The goal of the second study was primarily to examine the psychometric properties of the AWS but, in doing so, we also sought to explore some of the psychological correlates of agentic willpower. In particular, it was important to examine various personality traits that should theoretically be correlated with agentic willpower. It was also important to establish that the factor obtained in study 1 represented the same construct that we endeavored to capture with the new measure. In that regard, we feel reasonably confident in saying that the AWS corresponds to the factor underlying locus of control, self-efficacy, grit, and resilience, owing to the strong correlation that was obtained in the current study.

The internal consistency of the AWS appeared to be relatively high, indicating that the items were predictive of one another and that the scale was homogenous in nature. Evidence for construct validity came from its significant correlations with other psychological dimensions that would be theoretically linked to agentic willpower. Specifically, AWS scores were related to higher extraversion and conscientiousness, and lower neuroticism. We should caution that AWS scores only accounted for about 10% of the variance in extraversion and openness to experience, which may have limited practical significance. The AWS was also associated with lower boredom proneness, which might be expected as agency and striving towards goals run counter to “sitting around” and feelings of boredom. The AWS showed some of the same demographic trends that were observed in study 1, namely that older individuals and people with higher incomes showed higher levels of agentic willpower. These findings further supported

the notion that a common variable underlying locus of control, self-efficacy, grit, and resilience, was tapped by the AWS.

Study 3

The third study was very narrow in scope, insofar as we simply sought to determine whether agentic willpower would predict better academic performance (i.e. GPA). We should note that GPA was not self-reported and was obtained from actual student records. Scores on the AWS were obtained mid-way through the semester and each student's cumulative GPA was obtained at the end of the semester. We hypothesized that scores on the AWS would significantly predict cumulative GPA.

Materials and Methods

Participants

The participants were all students at a public 4-year college in upstate New York. The students were recruited from a branch campus and from the main campus. The mean age was 22.17 (SD=5.89). There were 88 females, 20 males, and one student identifying as gender non-binary. There was greater ethnic diversity compared to the previous two studies (see Table 5), which largely reflects the ethnic breakdown of the student body at the college. All participants completed the informed consent and received course credit for their participation.

Table 5. *Ethnicity Data for Study 3*

Ethnicity					
	White	Black	Hispanic	Asian	Multiple
	79 (72.5%)	8 (7.3%)	10 (9.2%)	3 (2.8%)	9 (8.3%)

Measures

Grade Point Average (GPA)

Student grade point average for the end of the Spring semester was obtained from student records. All students had provided permission for us to obtain their GPA and we took measures to protect confidentiality.

All students also completed the Agentic Willpower Scale (AWS), which has been described previously. Basic demographics information on age, gender, and ethnicity was also obtained. All measures, asides from GPA, were administered through Survey Monkey from March 26 to April 8 of the Spring semester, well in advance of the end of the semester (May 14).

Results

Seeing as the study was very limited in scope, the analysis was similarly narrow, consisting of descriptive statistics for the two variables in question along with the single correlation. Data was available for 107

students (one student did not complete the AWS and GPA could not be obtained for one student). The mean GPA was 3.25 (SD=.55) and the mean AWS score was 43.42 (SD= 6.54). A correlation of r=.31 (p=.001) was obtained between AWS scores and GPA at the end of the spring semester.

Discussion

The purpose of Study 4 was to determine whether agentic willpower would be able to predict real-world outcomes of achievement, in contrast to studies 1-3, which relied on self-report measures of various traits, mood, and demographic variables. AWS scores were a significant predictor of GPA, which could prove to be useful knowledge for educational professionals and researchers alike as GPA has a wide variety of contributing factors, both cognitive and non-cognitive. While we recognize that a correlation of .31 accounts for a little less than 10% of the variance in GPA, we should note that the correlation is slightly higher than that which is typically obtained with grit and GPA, conscientiousness and GPA (surprisingly), socioeconomic status and GPA, or even time spent studying/study habits and GPA.

General Discussion

Study1 was based on a hunch that many of the most studied variables in terms of academic and non-academic performance (i.e. locus of control, self-efficacy, grit, and resilience) were all facets of the same over-arching construct. Studies 1 and 2 confirmed that the variables loaded on a common factor, which we have dubbed "agentic willpower" to contrast it with more traditional perspectives on willpower that emphasize self-control. We define agentic willpower as the belief that one has control over, and can achieve, important outcomes, coupled with a determination to persevere through setbacks and stressors. This view is influenced by agency and action-oriented theories of willpower suggested by Williams (1899) and further developed by Wiggins (1991) and Bandura (2006).

Study 2 was aimed at developing a new measure of agentic willpower (the AWS), so that interested researchers would not need to use multiple scales and factor scores (a burdensome process) in measuring the construct. Based on the high correlation between factor scores, derived from all 4 indicators (locus of control, self-efficacy, grit, and resilience), and scores on the AWS, it would seem that the new measure is tapping the same underlying factor that was obtained in study 1.

The AWS seemed to be psychometrically sound. In study 2, relatively high internal consistency was obtained for the AWS and there was evidence for concurrent validity as AWS scores were related to a variety of personality variables in the manner that was expected. Study 3 demonstrated the predictive validity of the scale, as it was able to significantly predict GPA in a group of university students.

Age was consistently related to higher AWS scores such that older individuals seemed to have higher levels of agentic willpower. It could be

that as people age, they become more confident in their abilities and more resilient to setbacks, having overcome them successfully in the past. Of course, cohort effects cannot be ruled out either. There are a multitude of possible reasons for the finding but only well-controlled prospective studies could begin to address the question.

Income was likewise related to agentic willpower, with higher levels of agentic willpower seen at higher income levels. There could be a number of explanations for this finding, complicated by the directionality problem. From one perspective, it would seem that those who exhibit higher agency and striving towards goals are rewarded with higher income. On the other hand, it could be that people who are not provided with the same opportunities will naturally stop trying to achieve unattainable goals and will exhibit lower levels of the trait. Of course, there could be some truth to both perspectives or there could be other forces at work. As with age, only prospective studies are equipped to address the question.

Higher agentic willpower was consistently linked to lower depressive symptoms and generalized anxiety. There are a number of possible interpretations for the findings but they remain speculative as the studies were cross-sectional and the direction of the relationship could not be determined. For example, it could be that the symptoms of depression suppress agency. One could reasonably expect that anhedonia, fatigue, psychomotor agitation, hypersomnia, etc. would dampen one's motivation to pursue meaningful goals. On the other hand, it could be that those who lack the determination to pursue their goals may fall into a depressive funk. A similar situation exists for anxiety. Individuals paralyzed by worry will have difficulty tackling important projects. Conversely, if one lacks agentic willpower, goals may fall by the wayside, and people may fall on financial and/or relationship problems that breed anxiety. Of course, reciprocal relationships between these variables are possible so that all of these interpretations may have some truth. As for perceived stress, it could be that unfulfilled goals resulting from lower agentic willpower leads to a higher degree of stress.

The relationship between life satisfaction and agentic willpower lends itself to a rather simple interpretation: individuals who have determination in achieving their goals will more than likely be successful in time, and their successes will result in greater satisfaction with life. The same explanation would seemingly apply to happiness, to the extent that happiness is not simply a pleasant affective state but also involves finding meaning in one's life (see Diener, 1984). Also, the relationship between success and happiness is well-established, being the inverse of defeat and depression (Sloman, Sturman, and Price, 2011; Sturman 2019).

Perhaps the least surprising findings regarding personality are that agentic willpower was related to higher levels of conscientiousness, extraversion, and emotional stability. Conscientious individuals are described as dutiful, goal-oriented, hard-working, etc., which reflect a high degree of agency and determination to achieve goals. Grit, a component of

agentic willpower, is related to conscientiousness, but the degree of the relationship does not seem to indicate that they are the same construct (see for example Duckworth et al., 2007). Extroverted individuals tend to be more dominant in terms of their interpersonal behavior (McCrae & Costa, 1989) and, indeed, an important aspect of extraversion is assertiveness. Another aspect is higher activity level, which would naturally lend itself to achieving various objectives. Extroverted individuals also tend to be more outgoing and, in Western society, this trait is often valued and rewarded. From this perspective, they may have an easier time attaining valued goals, compared to their more introverted counterparts, which is not to say that introversion does not have its own benefits.

Regarding emotional stability (the inverse of neuroticism), one of the key facets of the trait is a vulnerability to stress. It stands to reason that individuals low in the trait may be less resilient and show lower agentic willpower, while those higher in emotional stability would have the opposite pattern. The moderate association with openness to experience had not been expected. Perhaps more creative individuals are better able to come up with novel solutions to overcome obstacles. We had expected a negative association between agentic willpower and boredom proneness, as people who tend to experience this state more frequently will have deficits in motivation.

Scores on the AWS were able to predict Grade Point Average at the end of the semester, which provided some support for the predictive validity of the instrument. One practical implication of these results is that researchers and educators may benefit from examining agentic willpower in students and perhaps envision ways in which to bolster the trait. One way this could be accomplished would be to design and implement an educational intervention that promotes agentic willpower in students. Previous research with a sample of middle school students showed a positive response to an educational intervention that targeted two of the four indicators (locus of control and grit; Zappala-Piemme et al., 2023). In that study, the curriculum included stories reflecting grit and control along with writing assignments and reflections on these traits. This kind of curriculum change could also include tasks that promote a feeling of mastery, which would theoretically bolster self-efficacy (Bandura, 1977). As for resilience, Ang et al. (2019) reviewed numerous intervention studies, which often include CBT-based skills building, behavioral modification, problem-solving, cognitive restructuring, and mindfulness techniques, and found that they improved resilience, reduced depressive symptoms and mitigated stress (although the effect sizes were relatively small). These studies point to the possibility that targeted interventions could be used to increase students' agentic willpower, which, in turn, could lead to improvements in mental health, satisfaction, and academic achievements. In the mental health sphere, it might be that some of the interventions aimed at bolstering resilience, mentioned above, would be good candidates for increasing agentic willpower.

Limitations and Future Directions

The generalizability of the research across samples appeared to be good, as we were essentially able to replicate our findings. We took measures to increase the representativeness of the samples in studies 1 and 2 by including the family members and friends of students but the samples were not very representative of the overall population as they were heavily White and hailed from small to medium-sized towns. Study 3 had a more diverse sample and, therefore, the findings with performance may generalize to other academic institutions. We should note that there did not seem to be differences in agentic willpower owing to ethnicity but further research with more diverse samples is in order.

It is also possible that our results could be reflective of the American cultural emphasis on independence and agency. It would be interesting to see if the same pattern of relationships would hold up in a less individualistic culture. To the extent that striving for status/mastery/dominance (i.e. agency) seems to be a universal motivation (see Wiggins, 1991) we would expect the pattern of relationships to be similar but this awaits further study. For this reason, it will be important to either replicate or expand on the present research at multiple sites. Collaborations with universities or researchers in both rural and urban locations across different cultures, using both students and community samples, would not only be helpful in this regard, but also increase the generalizability of the research.

We have mentioned the inability to make causal statements in regard to age and income but we should also note that all of the associations found in studies 1 and 2, preclude causal statements as the studies were cross-sectional in design. Study 3 sought to address this problem, as it was a prospective study, but additional longitudinal studies would help to illuminate the direction of the relationships between agentic willpower and mood/well-being. For example, the AWS could be assessed at baseline and, over the course of a year, participants could be assessed not only on the mood and adjustment related variables contained in the present study but also those captured by the Profile of Mood States (e.g. anger-hostility, vigor-activity, fatigue-inertia, etc.; Heuchert & McNair, 2012). It could also prove interesting to incorporate life event measures in a longitudinal study to determine whether agentic willpower can predict life stress.

Future research into the construct would also benefit from examining agentic willpower in relation to other outcomes. For example, we examined it in relation to academic performance but future studies could include work performance and retention in business or other organizational settings. Further, any number of variables related to adjustment and personality could be explored. The present study should be viewed more as a starting point but, based on the present research, we feel like the construct holds promise as a personality variable that incorporates important motivational features.

Statement of competing interests
There were no competing interests in the present research.

Ethics approval
The study was considered "exempt" research (i.e. not needing approval) by the Committee on the Protection of Human Subjects at SUNY Plattsburgh.

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Relative contributions
Edward Sturman was involved in the conception of all studies and Jennifer Bremser helped conceive the second study. Both Edward Sturman and Jennifer Bremser created the Agentic Willpower Scale. Edward Sturman conducted the statistical analyses and did the majority of writing. Jennifer Bremser wrote parts of the Introduction. Tyler Defoe wrote the descriptions of the Measures. All authors approved the manuscript.

Research promotion
In a series of studies, we established a new construct, which we call "agentic willpower." Agentic willpower incorporates grit, resilience, internal locus of control, and self-efficacy. We developed a scale to measure the new construct, which was significantly related to lower stress, anxiety, and depression and greater life satisfaction, happiness, and self-reported income. It was also able to significantly predict GPA in university students over the course of a semester.

Note 1: The pilot study had the same hypotheses as study 2 and used the same measures/procedure, with the exception of self-efficacy (the pilot study used the General Self-Efficacy Scale). However, there was an error in translating the General Self-Efficacy Scale to Survey Monkey (the response options were entered wrong), which precluded the use of that data in our analyses. We should note that the results were almost identical to study 2. Interested readers may contact the first author if they would like further details.

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Appendix A

Agentic Willpower Scale

1. I quickly overcome setbacks.

2. When I start something, I make sure that I complete the task.

3. I need positive feedback from others before I feel like I have done my job well.

4. I'm confident that I can achieve my goals.

5. I can usually get through stressful times without too much difficulty.

6. I make sure to always do my best.

7. I keep plugging away at a task even if it is going to take a while to achieve my goal.

8. No matter what job is presented to me, I set my mind to performing it well.

9. It takes me a while to move past obstacles in my life.

10. I tend to give up when things get tough.

11. I feel like I have control over what happens in my life.

12. When I start on a task I am uncertain that I will be able to do a good job.

Response Options:
1= Strongly Disagree
2=Disagree
3=Neutral
4=Agree
5=Strongly Agree

Reverse Score: Items 3, 9, 10, 12

Scoring: After reverse scoring items, sum all of the item scores.