DISTRESS INTOLERANCE IN GOAL PURSUIT: VALIDATION OF A NOVEL BEHAVIORAL MEASURE

by

Luke Vargo, B.S.

A thesis submitted to the Graduate Council of
Texas State University in partial fulfillment
of the requirements for the degree of
Master of Arts
with a Major in Psychological Research
May 2023

Committee Members:

Reiko Graham - Chair

Kristen Tooley

Joseph Etherton

DEDICATION

To my close friends and family (both old and new) that have been integral to my motivation; it truly does take a village.

ACKNOWLEDGMENTS

Dr. Graham, I would not have been able to attempt this journey without your kind words of encouragement; they were a life saver at times! Also, I cannot thank my thesis committee enough for their invaluable guidance during this entire process. I would also like to thank Dr. Rogers for her support on both professional and personal matters. Finally, I would like to extend my deepest appreciation to Jackson Nunley, Esmeralda Marroquin, Sydney Kuykendoll, Sierra Simmons, Amelya Rivera, and Ray Chavez, as their help with data collection was crucial to the completion of this project. It has been a fantastic experience making new friends and connections with the many passionate and intelligent people in our department!

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

ABSTRACT

Elevated levels of grit, while regarded as a beneficial characteristic indicative of success and well-being, may induce amoral and unethical behaviors associated with Machiavellianism. However, failure to withstand distress associated with goal attainment, such as adjusting goals and deadlines or engaging with tedious tasks, may better explain the adoption of Machiavellian strategies. If an individual is overwhelmed with negative affect and poorly equipped to cope, they might be more inclined to cheat, manipulate others, or engage in other callous behaviors to mitigate distress and continue progressing towards their goal. Study 1 (N = 139) tested this hypothesis using a self-report measure of distress intolerance, and Study 2 (N = 171) replicated these self-reported results while also validating a novel measure of behavioral distress intolerance, "Getting Over It with Bennett Foddy," to address limitations of existing assessments. Combined, results from both studies suggested higher levels of grit do not predict employment of Machiavellian attitudes, and, in fact, fostering grit may be a protective factor against Machiavellianism by indirectly improving a persons' ability to withstand negative affect. Finally, the proposed novel task successfully elicited negative affective states and performance, specifically total playtime and number of setbacks experienced, predicted self-reported distress intolerance. Implications and directions for future research are discussed.

I. INTRODUCTION

Grit is described as the consistent interest in and perseverance towards long-term goals (Duckworth et al., 2007). It has been associated with several facets of success and well-being, such as increased grade point average (GPA; Duckworth et al., 2007), deliberate study time (Duckworth et al., 20011), sense of belonging (Bowman et al., 2014), and psychological capital (environmental and psychological sources of hope, efficacy, resilience, and optimism; Luthans et al., 2019). Though primarily regarded as a beneficial characteristic, higher levels of grit can potentially manifest into maladaptive behaviors and attitudes, such as excessive perseverance in academic and mental health contexts (Karabenick, 2003; Lucas et al., 2015; Wilson et al., 2021), reduced cognitive flexibility (Kalia et al., 2019), and perfectionism (Cormier et al., 2019; Dunn et al., 2021). In light of these reports, researchers (Arli et al., 2020; Houston et al., 2020) are questioning if the heightened perseverance of effort involved in grit overlaps with the unethical behaviors related to Machiavellianism, the tendency to primarily act out of self-interest by exhibiting amoral, callous, and manipulative behaviors (Christie & Geis 1970). Both Arli et al. (2020) and Houston et al. (2020) considered if promoting grit leads to maladaptive or antisocial tendencies, aiming to inform emerging interventions designed to bolster gritty resilience in academic and corporate settings (Alan et al., 2019; Vaart et al., 2021). However, these two studies provide conflicting results pertaining to the relationship between grit and Machiavellianism, urging further consideration of this association and other variables potentially involved. Specifically, differing relationships with distress intolerance may explain discrepancies in morality between gritty and Machiavellian individuals.

Distress intolerance, the inability to withstand and surpass negative affective states resulting from obstacles impeding a seemingly attainable goal (Anderson & Bushman, 2002;

Ellis, 1979, 1980; Leyro et al., 2010; Zvolensky et al., 2010), is connected to myriad forms of psychopathology, including anxiety, depression, agoraphobia, and addiction among others (Brown et al., 2005; Ellis, 1979, 1980). Additionally, succumbing to distress is related to increased aggression and counterproductive workplace behavior (Spector et al., 2006). Previous studies have highlighted the inconsistent correlations grit and Machiavellianism have with distress intolerance, which suggest that gritty individuals persevere through distress more willingly than Machiavellians (Duckworth et al., 2007, 2011; Meindl et al., 2019; Rai & Gupta, 1988). It is possible that the psychological dysfunction and behaviors inherent to lower distress intolerance may explain why some people remain resilient and gritty while others employ manipulative tactics in the pursuit of achievement.

Existing literature commonly assesses distress intolerance through self-report methods (Leyro et al., 2010; Zvolensky et al., 2010), but since self-report methods can be easily biased by social desirability, selective recall, and other artifacts, this association should be examined using a behavioral index of distress intolerance as well. However, a novel task is needed to address the limitations presented by previous assessments. Existing behavioral measures of psychological distress intolerance, like the Paced Auditory Serial Addition Test, Mirror Tracing Persistence Task, and unsolvable anagram puzzles (Lejuez et al., 2003; Meidnl et al., 2018; Strong et al., 2003), suffer from limitations which hinder convergence between task performance and self-reported distress intolerance (Leyro et al., 2010; Zvolensky et al., 2010). Ameral et al. (2014) posit the tasks are perceived as impossible to complete, thwarting participant motivation to engage with the paradigms. Consequentially, absolving perceived responsibility and control over task outcomes causes participants to stop participating prior to the assessment ending. These tasks diverge from real-world circumstances of tolerating distress, such as managing a chronic

illness (Berglund et al., 2014) or experiencing racial discrimination (Uomoto, 1986), in which perceived control is essential to enduring negative affect and sustaining goal-oriented behaviors. It would therefore be useful to validate a novel behavioral measure of psychological distress intolerance.

Employing the computerized video game "Getting Over It with Bennett Foddy" (Foddy, 2017) may address the limitations set forth by Ameral et al. (2014). This task involves navigating through a difficult but not impossible obstacle course (see Figure 2 for an example), allowing participants to have better control over performance and measured outcomes. Without interference from contrived, uncontrollable impediments like random cursor drift or overwhelmingly rapid presentation of stimuli, successful moves will progress the character towards the finish line while haphazardous attempts will result in setbacks and distress. The proposed novel paradigm might foster a sense of control within participants, encouraging intrinsic motivation to persist as long as bearable and clarifying the relationship between task performance, grit, and self-reported distress intolerance.

II. ADAPTIVE GRIT

Grit and Achievement

Grit is predominantly considered an adaptive, beneficial characteristic associated with several measures of success and well-being. When validating the Grit Scale in a six-study paper, Duckworth and her colleagues (2007) reported a positive relationship between grit and academic attainment in two different samples (N = 1,545 and N = 690) of adults over 25 years old. The same paper establishes that, in addition to obtaining a higher ranking degree, gritty individuals are also less likely to make career changes throughout their lifetime (Duckworth et al., 2007). Samples of Ivy League undergraduates (N = 138) and United States Army West Point cadets (N = 1,218 and N = 1,308) were analyzed to specifically target high achieving people. Analyses indicated grit positively correlated with GPA and student retention while accounting for unique variance above and beyond two other closely related concepts, conscientiousness and self-control. Though all are essential components of pursuing goals, the authors explained self-control relates to inhibiting more abrupt distractions like eating an unhealthy snack, checking your phone after a notification, or procrastinating and delaying tasks. Grit, on the other hand, is involved in long-term objectives like attaining a PhD. Somebody could successfully study for a PhD while also struggling to maintain a healthy diet, noting the distinction between these related constructs. This supports that, while closely related, grit is a separate construct from conscientiousness and self-control.

The last of the six studies validating the Grit Scale (Duckworth et al., 2007) examined a sample of participants in the Scripps National Spelling Bee (N = 175) with results suggesting grit was positively associated with performance in the final round. These findings were successfully replicated using another sample of Scripps National Spelling Bee contestants (Duckworth et al.,

2011). Interestingly, this replication noted that grittier participants sought more deliberate, intentional study time (e.g., individually reading and spelling words versus being quizzed by a friend), despite reporting these methods invoked boredom. In other words, they acknowledged the benefits of deliberate studying and preferred enduring the distress of these boring methods because they were perceived as more effective. These methods were indeed more effective, as deliberate study time mediated the relationship between grit and performance during the competition. The initial studies validating the Grit Scale (Duckworth et al., 2007; Duckworth et al., 2011) support grit is critical in achievement, and individuals with higher grit are willing to tolerate distress and negative affect for the sake of successful goal attainment.

The relationship between grit and academic performance has been illustrated in other studies as well. Strayhorn (2013) examined the role of grit in Black male collegiate success with results again indicating positive correlations between grit and both GPA and ACT scores. Grit also accounted for additional variance when predicting college grades beyond demographic factors, previous academic achievement, and relevant confounding variables. A study conducted by Kannangara et al. (2018) further supports the importance of grit in pursuing goals as their results showed a positive relationship between grit, self-control, and resilience. Additionally, Bowman et al. (2014) reported positive associations between grit, GPA, and intent to persist through college, but a negative relationship between grit and intent to change majors. Beyond connecting persistence and achievement, this study also captured a positive relationship between grit and student-faculty interactions, implying that grittier students were more likely to engage with professors during class and office hours. This finding may also extend to interactions with faculty advisors and other staff pertinent to accomplishing academic and professional goals. In combination, the aforementioned studies not only provide empirical support for the relationship

between grit and achievement, but also begin to illuminate a difference in how gritty individuals engage with their environments when compared to less gritty counterparts. Reports from Bowman et al. (2014) and Kannangara (2018) suggest grit may also play a role in cultivating well-being.

Grit and Well-Being

This difference in how gritty people interact with their environment is noticeable through associated behaviors and attitudes that foster well-being. Shortly after the validation of the Grit Scale, Singh and Jha (2008) considered the relationship between grit and constructs of happiness, life satisfaction, and both positive and negative affect. The aim of this study was to explore correlations among these variables and improve validity when predicting happiness and life satisfaction from positive and negative affect. Preliminary bivariate correlations indicated significant positive relationships between grit, life satisfaction, happiness, and positive affect, and a negative relationship between grit and negative affect. Results of a hierarchical multiple regression revealed that grit significantly predicted both happiness and life satisfaction. Importantly, grit accounted for the most unique variance in happiness measures compared to the other two predictors, positive and negative affect. These results suggest grit is valuable beyond contexts of achievement and is a factor in happiness and life satisfaction as well.

Aside from corroborating the relation between grit and GPA, Bowman et al. (2014) extend the notions presented by Singh and Jha (2008) by considering the relationship between grit and college satisfaction, academic adjustment, sense of belonging, and faculty-student interactions. Findings from this study imply gritty individuals are more satisfied with their college experience, adjust to academic responsibilities more effectively, have a higher sense of belonging, and interact with faculty members more frequently. Coinciding with these reports,

Kannangara et al. (2018) found grit is associated with resilience and having a growth oriented mindset. This claim is corroborated by Knauft (2019), as her analyses indicated gritty people more frequently engaged in cognitive reappraisal (altering perception of a context to change emotional impact; Lazarus & Alfert, 1964) to mitigate perceived stress.

To further delve into the connection between grit and sense of belonging, Arya and Lal (2018) examined the role of sense of coherence, a higher order construct describing a person's perception of their environment, stressors, and value within their ecological niche (Antonovsky, 1993). Results indicated a positive relationship between grit and well-being, in addition to evidence that this relationship was mediated by sense of coherence. In other words, these studies suggest gritty individuals achieve heightened well-being by clearly identifying their goals, recognizing the profound opportunities available to them, engaging with their environment, deriving meaning from goal-oriented tasks, and reframing shortcomings in a more positive manner. These behaviors and attitudes associated with grit foster well-being and help to maintain endurance during the pursuit of difficult, tedious goals.

Further, the heightened well-being associated with grit consequently reinforces resilient tendencies to further secure well-being in the future. This is apparent through the relationship between grit and Psychological Capital (PsyCap), a higher order factor comprising the resources of hope (the capacity to set goals), efficacy (confidence), resilience (ability to overcome obstacles), and optimism (tendency to form positive attributions regarding instances of both success and failure; Luthans et al., 2007; Lorenz et al., 2016). Previous studies have reported a positive relationship between grit and PsyCap (Jeong & Jung, 2018; Luthans et al., 2019; Shafique et al., 2022) This emphasizes the role of psychological resources in maintaining gritty persistence. Specifically, Luthans et al. (2019) provide evidence for PsyCap mediating the

association between grit and student success, specifically claiming a cyclic relationship exists between these variables. Gritty people engage in behaviors and attitudes which foster psychological resources, and these resources, in turn, serve as reinforcement and motivation to continue employing those gritty behaviors and attitudes in future endeavors. Overall, grit aids in pursuing goals, and successful goal attainment fulfills psychological resources; fulfilment and satisfaction of PsyCap promotes future grit and resilience.

Overall, the extant literature denotes grit as a beneficial characteristic strongly associated with improved academic performance and endurance through monumental challenges, like participating in the Scripps National Spelling Bee or graduating from the US Military West Point Academy (Bowman et al., 2014; Duckworth et al., 2007; Duckworth et al., 2011; Strayhorn 2013). Grit is also a critical asset in realizing psychological well-being, as it is associated with increased positive affect and life satisfaction, cognitive reappraisal to reframe distress, deriving meaning from goals and achievements, and enthusiastically seeking opportunities within surrounding environments (Arya & Lal, 2018; Bowman et al., 2014; Knauft, 2019; Singh & Jha, 2008). The well-being and positive emotions resulting from gritty goal attainment provide motivation to sustain these tenacious behaviors (Luthans et al., 2019). However, although grit promotes achievement and well-being, it may also be associated with a "win at any cost" mindset that can manifest into destructive and antisocial behaviors.

III. MALADAPTIVE GRIT

Excessive Perseverance

While grit is largely considered beneficial, balance is critical as an exclusive focus on achievement may lead to maladaptive or amoral tendencies. The notion of excessive, maladaptive grit was first considered by Lucas and colleagues (2015) in a study where gritty individuals were found to persist on difficult anagrams regardless of the risk of solving fewer altogether. Specifically, participants were given 20 minutes to attempt 37 anagrams, 5 of which were designed to be highly difficult and 16 were unsolvable (unknowingly to the participants) to simulate a timed test environment where test items should be skipped in order to maximize overall performance (e.g., taking the Scholastic Aptitude Test (SAT), American College Test (ACT), or Graduate Record Examination (GRE)). Gritty people spent more time on difficult questions instead of skipping them, answering other questions, and then returning to the remaining items if time allowed. This method, although it displays determination, presents the possibility of leaving several items unanswered and obtaining a lower score overall. Furthermore, participants in this study were incentivized to solve as many anagrams as possible. For each correct solution, they were entered into a drawing for a $100 gift card. The single participant that answered the most anagrams correctly received a bonus of $2, but the remaining people received nothing aside from the lottery entries. However, all participants were regularly given the option to exit the study prior to completion for a $1 bonus in addition to the lottery entries. Not only were gritty individuals willing to risk receiving a "failing" score, but they risked a monetary loss as well by turning down the smaller bonus and opting to continue working for the $2 reward despite the likely outcome of receiving nothing as they obliviously persisted on

difficult and unsolvable anagrams. This illustrates how gritty persistence can be maladaptive under particular circumstances.

Kalia et al. (2019) reported similar results using challenging sudoku puzzles. Although grittier people had a higher proportion of correct to incorrect answers, they attempted fewer squares overall than the less gritty participants. This reiterates notions from Lucas et al. (2015) by capturing the excessive perseverance associated with grit. Considering the goal of the task was to complete the entire sudoku puzzle, grittier participants risked failing this goal for the sake of persisting on individual squares. In a second study by this team, participants completed similar sudoku puzzles along with the Wisconsin Card Sorting Task (Curtiss & Tuttle, 1993), a computerized procedure involving appropriately sorting cards into different stacks after deciphering rules (e.g., sort by color, shape, or number on the card) that periodically change without notice. The ability to successfully recognize these shifting rules, noted by feedback after each trial, and adapt your behavior is described as cognitive flexibility. Kalia et al. (2019) reported grittier participants attempted fewer sudoku squares overall and performed worse on the Wisconsin Card Sorting Task (Curtiss & Tuttle, 1993). Further, an indirect effect of grit on time spent on individual squares through lower cognitive flexibility, suggesting that grit might be associated with a stubborn attitude which could hinder efficiency overall. This study supports the idea that grit is potentially related to a rigid, maladaptive mindset under certain conditions, as seen in the study conducted by Lucas et al. (2015).

Examples of this rigid mindset and excessive perseverance have also been documented in relation to help-seeking behaviors. Karabenick (2003) reported that more resilient students were less likely to seek aid with challenging material. As captured by Lucus et al. (2015) and Kalia et al. (2019), if the material is too challenging, excessively persisting versus seeking help may

create additional psychological distress or a reduced grade overall. Similarly, results from Wilson et al. (2021) suggest grittier student veterans are less likely to engage with mental health services compared to their less gritty counterparts and other student populations. In sum, these studies imply elevated grit may be associated with cognitive inflexibility, which is exhibited through excessive perseverance in both academic and mental health settings. While persistence aids goal attainment, ignoring the diminished returns of sustained efforts may create a less optimal outcome, such as a reduced test score, loss of money and other resources, or prolonged psychological distress. This illustrates the potential for an exclusive focus on achievement and excessive perseverance to ultimately hinder achievement and well-being, suggesting grit may indeed have negative aspects.

Grit and Perfectionism

A particular maladaptive tendency noted by an exclusive focus on achievement is perfectionism. Specifically, perfectionism is a multidimensional trait characterized by high standards combined with an overwhelming fear of failure, or perfectionistic strivings and perfectionistic concerns respectively (Frost et al., 1990; Hewitt et al., 1991). Perfectionistic strivings are adaptive habits designed to accomplish goals, and perfectionistic concerns describe attitudes and behaviors which often mitigate performance, optimism, self-esteem, and motivation while exacerbating anxiety, anger, rumination, and burnout (Gotwals et al., 2012,; Hill et al., 2018; Jowett et al., 2016; Liu et al., 2021).

With a sample of student athletes, a study by Cormier and colleagues (2019) used a hierarchical multiple regression model to consider the link between grit and factors of perfectionism. Results showed that perfectionistic strivings were positively related to grit while a negative association existed between perfectionistic concerns and grit. A later study by the same

team used structural equation modeling instead and reached similar conclusions that perfectionistic strivings and concerns again had positive and negative relationships with grit respectively (Dunn et al., 2021). Importantly, perfectionistic strivings and concerns were strongly and positively correlated in both studies, suggesting that the fear of failure is at least partially inherent to pursuing success. These studies, therefore, illustrate the decline in grit when fear of failure is the dominant motivation for progression towards goals. The results suggest that heightened grit is associated with perfectionistic attitudes, and grit can potentially be hindered if a fear of failure goes uncurbed. Houston et al. (2020) extended these results by considering how grit pertains to self- and other-oriented perfectionistic tendencies. The data corroborated previous findings since grit positively predicted both self- and other-oriented perfectionism, suggesting gritty individuals may hold distressingly high standards for both themselves and others. Again, these studies capture how higher levels of grit can be associated with maladaptive tendencies detrimental to future motivation and well-being.

Grit and Machiavellianism

Another potential negative consequence of grit is Machiavellianism, a dimension of personality characterized by believing others act only in self-interest, combined with exhibiting manipulative and deceitful behaviors to build or sustain power and status (Christie & Geis 1970). Ryckman et al. (1994) suggest that Machiavellianism is associated with hyper-competitiveness as high Machiavellian individuals are both overly concerned with success and are willing to employ almost any method necessary to achieve goals, such as cheating (Cooper & Peterson, 1980) or defecting from an interdependent relationship (Malesza, 2018). Considering the theoretical overlap between grit and Machiavellianism as both relate to pursuing achievement, Houston et al. (2020) raised concerns over the potential for amoral behavior to result from the

cognitive inflexibility associated with an unwavering focus on success. To address this concern, the team tested whether grit was related to hyper-competitiveness, Machiavellianism, and other antisocial personality traits. The results indicated grit positively predicted hyper-competitiveness, but surprisingly, a moderate negative correlation existed between grit and Machiavellianism.

Similarly, a study by Arli et al. (2020) examined the relationships between grit and maladaptive personality traits, aiming to inform interventions designed to reduce unethical behavior in the workplace. Inconsistent with reports from Houston et al. (2020), results revealed a modest positive relationship between grit and Machiavellianism with the largest correlations being with subscores of amorality and desire for status (Arli et al., 2020). This corroborates the notion excessive perseverance may encourage a "win at any cost" attitude and employment of unethical goal attainment strategies; however, the discrepant reports between Houston et al. (2020) and Arli et al. (2020) urge further analysis of the relationship between grit and Machiavellianism and consideration of potential confounding variables.

Overall, recent studies suggest that grit is associated with cognitive rigidity that may produce maladaptive tendencies, such as persevering despite accrued resource losses (Lucas et al., 2015; Kalia et al., 2019), distressing expectations surrounding achievement (Cormier et al., 2019; Dunn et al., 2021; Houston et al., 2020), and manipulative or callous approaches to goal pursuit (Arli et al., 2020; Houston et al., 2020). However, the contradictory previous reports of a positive (Arli et al., 2020) and negative (Houston et al., 2020) relationship between grit and Machiavellianism demand additional attention. Considering grit is the target of academic and corporate interventions (Alan et al., 2019; Vaart et al., 2021), it is imperative to assess if fostering achievement and resilience breeds deceitful behaviors aimed at accomplishing goals. Importantly, it also has not been discerned if an unwillingness to tolerate distress inherent to goal

attainment (D'Mello & Graesser, 2012) accounts for the adoption of Machiavellian versus gritty strategies.

IV. THE ROLE OF DISTRESS INTOLERANCE

Distress tolerance is the capacity to withstand negative affective states while maintaining goal-oriented behaviors (Ellis, 1979, 1980; Leyro et al., 2010; Zvolensky et al., 2010). The inability to tolerate distress and frustration (distress intolerance) is a critical aspect involved in the formation and maintenance of several psychological disorders, including agoraphobia, general anxiety, depression, substance abuse, personality pathology, and eating disorders (Brown et al., 2005; Corstorphine et al., 2007; Ellis, 1979, 1980; Gross & Munoz, 1995; Linehan, 1993; Keough et al., 2010). For example, rigidly expecting constant comfort exacerbates perceived distress when experiencing negative affect, creating anxiety and depressive symptoms (Ellis, 1979, 1980). Further, the perceived distress is often reported as unbearable which influences the use escape behaviors, like consuming substances, disordered eating, self-injurious behaviors, or physically evacuating the premise, to alleviate the source of negative affect (Brown et al., 2005; Corstorphine et al., 2007; Linehan, 1993). Intolerant expectations surrounding negative affect are also associated with avoidance behaviors, such as maintaining house-bound isolation, to decrease the likelihood of experiencing distress in the future (Ellis, 1979, 1980; Linehan, 1993). In sum, withstanding distress is a critical protective factor against psychological dysregulation.

At the subclinical level, failing to cope with frustration often results in increased aggression towards yourself, the source of the distress, and even unrelated people and objects (Anderson & Bushman, 2002; Dill & Anderson, 1995; Marcus-Newhall et al., 2000). In social contexts, this can be displayed through physical and verbal aggression, libel and slander, cynicism, property damage, theft, knowledge withholding, and narcissistic rivalry (Bies & Tripp, 2005; De Clercq et al., 2021; Merchant & Lundell, 2001; for review, see Spector et al., 2006). Distress intolerance in academic settings is extensively connected to more frequent

procrastination (Abramowski, 2018; Ahmad et al., 2018; Harrington, 2005b), as well as attitudes of learned helplessness (Filippello et al., 2018) and alcohol consumption after shortcomings (Williams et al., 2015). However, the capacity to endure frustration has been associated with increased collegiate GPA (Wilde, 2012), psychological well-being (Darzi et al., 2022), willingness to forgive others (Matheny et al., 2017), and successful therapeutic results among clinical populations (Farris et al., 2016; Zeifman et al., 2020). These reports further suggest enduring negative affect is an essential facet of both psychological well-being and prosocial behavior.

Given the possible outcomes of failing to withstand distress, this capacity is essential for healthy, successful, and prosocial daily functioning. This is alluded to by Duckworth et al. (2007, 2011), as more gritty Script National Spelling Bee participants chose undesirable but deliberate study methods in preparation and advanced into later rounds of the competition. The authors suggest that more deliberate study methods (e.g., reading the dictionary or independently spelling words to yourself) require tolerating more frustration and distress compared to relaxed methods like being quizzed by friends. Using a behavioral task, Meindl et al. (2019) examined if grittier students can tolerate more distress. The results suggested that both self- and teacher-reported grit was negatively related to distress intolerance, and distress intolerance also predicted GPA and progress towards a college degree when assessed at the end of the two-year longitudinal study. These results support the critical role of enduring distress in the gritty pursuit of goals, especially since students consistently experience frustration during their studies (D'Mello & Graesser, 2012).

Distress intolerance is also a theorized component of Machiavellianism, as both are associated with aggression and antagonism, antisocial tendencies, and emotional dysregulation,

impulsiveness, and stimulation seeking (Birkas et al., 2015; Brumbach et al., 2009; Jonason & Tost, 2010; Rogoza et al., 2019, 2022). Most directly, Rai & Gupta (1988) used a behavioral measure to assess distress intolerance among Machiavellian individuals. Participants attempted four puzzles, two of which being impossible to solve (unknown to the participants), with less time spent on the impossible tasks being operationalized as distress intolerance. High Machiavellian participants spent less time on the unsolvable puzzles, suggesting they exhibit more distress intolerance (lower distress tolerance in other words) compared to less Machiavellian individuals. This finding illustrates that Machiavellian individuals are less willing to tolerate distress compared to gritty people (Kalia et al., 2019; Lucas et al., 2015; Meindl et al., 2019). Combined, previous studies (Kalia et al., 2019; Lucas et al., 2015; Meindl et al., 2019; Rai & Gupta, 1988) suggest grit and Machiavellianism have opposing relationships with distress intolerance. Therefore, differences in this ability may explain why certain individuals maintain ethical diligence while others engage in amoral tactics to achieve success, warranting further investigation of the relationships among these personality characteristics.

Limitations of Existing Distress Intolerance Behavioral Measures

In the established literature, behavioral distress intolerance has been most commonly operationalized as time spent engaging with tasks that induce physical and cognitive distress. Methods to induce physical distress include ice baths, voluntary hyperventilation, and CO_2 ingestion while the Paced Auditory Serial Addition Test (PASAT; Lejuez et al., 2003), Mirror Tracing Persistence Task – Computerized (MTPTC; Meidnl et al., 2018; Strong et al., 2003), and unsolvable anagram puzzles (Brown et al., 2009; Daughters et al., 2005; Rai & Gupta, 1988) are more likely to elicit cognitive and psychological distress. However, the outcomes from these tasks tend to not strongly correlate with self-reported distress intolerance (Cougle et al., 2013;

Leyro et al., 2010; McHugh & Otto, 2011; Meindl et al., 2019; Zvolensky et al., 2010). Authors of previous studies suggested these discrepancies arise from issues with measuring task persistence (Cougle et al., 2013), heterogeneous construct definitions for distress intolerance (Leyro et al., 2010; Zvolensky et al., 2010), and reasons for task cessation other than attitudes of distress intolerance (Ameral et al., 2014). In turn, it is hypothesized behavioral and self-rated scales may actually capture distinct lower order factors of distress intolerance and, therefore, should not coincide exactly. This is because self-report measures capture an individual's perceived confidence to persist, but behavioral tasks objectively assess this capacity. While efficacy to persist influences a person's actual willingness to tolerate distress, survey and behavioral data rarely correlate highly, similar to measures of empathy, IQ, self-control, and emotional intelligence (Dang et al., 2020; Melchers et al., 2015; Murphy & Lilienfeld, 2019; Park et al., 2016; Rouder & Haaf, 2019). Therefore, probing distinct constructs may explain negligible correlations among self-report and behavioral measures of distress intolerance.

Alternatively, Ameral and colleagues (2014) sought to rectify the poor concordance between behavioral and self-reported distress intolerance by considering motives for quitting two behavioral tasks, the PASAT and MTPTC. Through thematic analysis of open-ended questions, the authors categorized reasons for cessation into four groups: loss of control, arbitrary goals, time constraints, and escape from distress. The first group describes individuals that recognized the overwhelming difficulty of the tasks, deemed them impossible to complete, and stopped engaging after believing they had no control over the measured outcome. Inducing frustration via contrived circumstances (i.e., random cursor drift, very rapid presentation of stimuli, unsolvable problems) rather than controllable behaviors caused participants to stop participation prior to the end of the assessment. The loss of perceived control over measured outcomes also encouraged

participants to pursue arbitrary goals rather than accomplishing the entire task. For example, Ameral et al. (2014) found that, when completing the MTPTC by tracing a star while under the influence of random cursor drift, some participants aspired to reach just the first or second vertex instead of accomplishing the entire task. Similarly, during the PASAT, it was revealed that select participants aimed to only add a small sequence of values after perceiving the task as impossible. This suggests the tasks may be too overwhelming and uncontrollable to sustain participation and elicit a relationship with self-report distress intolerance measures. Furthermore, the tasks were only administered for five minutes, so the time limit elapsed before some individuals perceived the distress as unbearable. Future designs may resolve this ceiling effect by extending time allotted to procedure administration. The final category identified by Ameral et al. (2014) aligns with attitudes of distress intolerance, as some participants stopped to escape the discomfort caused by the tasks. However, even analysis of this group in isolation failed to correlate PASAT and MTPTC scores with values on the Distress Tolerance Scale (Simons & Gaher, 2005), further emphasizing the relevance of contextual factors (e.g., perceived control and time constraints) in measurement of this construct. The limitations presented by Ameral et al. (2014) highlight the reduced utility of extant behavioral distress intolerance assessments and urge the validation of a novel paradigm. Thus, reinstating control over performance to participants and extending procedural durations could help clarify the relationship between task performance and self-reported distress intolerance.

Proposed Novel Task

To address the aforementioned limitations regarding perceived loss of control over task outcomes, arbitrary goals, and time constraints, the computer video game "Getting Over It with Bennett Foddy" (Foddy, 2017) will be utilized to assess behavioral distress intolerance. This

game requires players to navigate a challenging obstacle course using only the pivot point of a hammer while stuck in a cauldron (see Figure 1). Given 65% of adults over 18 years of age and 71% of children under 18 years old play video games (Entertainment Software Association, 2022), this may provide a more ecologically valid approach. The likelihood of an individual engaging with a video game is likely higher than experiencing a situation similar to contrived distress intolerance tasks, like ice baths, CO_2 ingestion, rapid addition of numbers, or tracing a shape with forced cursor drift. Similarly, this game presents the opportunity to address other limitations of previous methods, particularly those identified by Ameral et al. (2014): Poor perceived control over task outcomes, arbitrary and subjective goals, and time constraints. Unlike with the PASAT and MTPTC, the difficulty of this game creates a challenge without removing control from the player. A participant would experience a setback on the course solely due to skill deficits rather than setbacks being a deliberate and uncontrollable element of task design, like rapid presentation of stimuli or cursor drift. Even after a setback, players could learn from their mistakes, adapt their gameplay, and avoid repeating the error. Combined, this will allow participants greater control over their performance. Enhancing the perceived control involved in the task may encourage participants to progress further into the game rather than stopping after completing an arbitrary goal. Finally, increasing the time allotted for task administration will expand the opportunity for distress to be perceived as unbearable. As described by Bennett Foddy (2017), emotions experienced during this game are similar to those during real-world instances of frustration and distress, like after losing a completed homework assignment or staining a freshly washed shirt. However, unlike with existing behavioral distress intolerance tasks, participants are able to adjust their performance and better influence measured

outcomes. Therefore, “Getting Over It with Bennett Foddy” (Foddy, 2017) may serve as a useful assessment of distress intolerance.

V. PURPOSE

Given the conflicting reports of the association between grit and Machiavellianism, the first research question addressed by the current project considers if higher levels of grit predict the callous and amoral behaviors and attitudes associated with Machiavellianism. Previous studies have identified that gritty individuals tend to have lower distress intolerance (Duckworth et al., 2011, Kalia et al., 2019; Lucas et al., 2015; Meindl et al. 2019) than Machiavellian people (Rai & Gupta, 1988). Because low distress intolerance is associated with ethical and prosocial behavior (Bies & Tripp, 2005; De Clercq et al., 2021; Matheny et al., 2017; Merchant & Lundell, 2001), it was hypothesized that grit would be negatively associated with Machiavellianism. It was also anticipated distress intolerance would be negatively related with grit but positively associated with Machiavellianism, and self-report distress intolerance will at least partially mediate the relationship between grit and Machiavellianism so that grit negatively predicts Machiavellianism through reduced distress intolerance.

The second research question addressed was if performance on the video game "Getting Over It with Bennett Foddy" (Foddy, 2017) predicted self-report distress intolerance. It was anticipated that engaging with the challenging task would elicit higher levels of frustration, anger, and potentially satisfaction as a result of playing a video game. Also, increased playtime, playtime per screen, number of obstacles passed, and setbacks endured should predict lower distress intolerance. Finally, significant predictors of self-report distress intolerance will at least partially mediate the relationship between grit and Machiavellianism such that grit negatively predicts Machiavellianism through an increase in playtime, number of obstacles passed, and setbacks endured.

VI. STUDY 1

Since previous reports have identified both a positive (Arli et al., 2020) and negative (Houston et al., 2020) relationship between grit and Machiavellianism, the present study sought to provide additional evidence for the direction of this relationship. Further, the mediational role of distress intolerance was examined in order to consider if failing to withstand negative affect predicts the use of unethical goal attainment strategies above and beyond grit.

Method

Participants.

Participants consisted of a sample of 139 undergraduate students drawn from the psychology program at Texas State University. Participation was compensated with extra credit for an introductory psychology course. The sample resembled the demographics of psychology students at Texas State University with the average age being 21.96 years (SD = 4.23) and most participants identifying as female (83.5%). The majority of the sample self-reported as Caucasian (59.4%), Hispanic (17.3%), and Black (12.8%). Participants remotely completed a survey on Qualtrics in which they provided demographic information and completed the Grit Scale, Machiavellian Personality Scale, and Frustration Discomfort Scale. Missing data (less than 1%) was missing completely at random (p > .999) and handled via listwise deletion. Procedures for human subjects were approved by the Texas State University Institutional Review Board.

Measures.

Distress intolerance. To consider the precise content of intolerant beliefs, the Frustration Discomfort Scale (Harrington, 2005a) uses 28 items to assess the rigidity of attitudes pertaining to discomfort intolerance (I need the easiest way around a problem; I can't stand making a hard time of it), entitlement (I can't stand having to wait for things I would like *now*), emotional

intolerance (I can't bear disturbing feelings), and achievement (I can't stand doing a job if I'm unable to do it well). This measure uses a 5-point Likert scale anchored at 1 (*absent*) and 5 (*very strong*) with summed responses ranging from 28 to 140. Higher scores suggest increased distress intolerance, or a worsened ability to withstand negative affect in other words. Coinciding with the existing literature using this scale to assess distress intolerance (Zvolensky et al., 2010), the reliability was good for this scale (α = .90).

Grit. The full Grit Scale (Duckworth et al., 2007) measures perseverance of effort (setbacks don't discourage me) and consistency of interests (I have achieved a goal that took years of work). Participants respond to 12 items using a 5-point Likert scale ranging from 1 (*not like me at all*) to 5 (*very much like me*). Responses are averaged together, so possible scores vary from 1 to 5 with higher values noting grittier individuals. The reliability was acceptable for this scale (α = .81).

Machiavellianism. The Machiavellian Personality Scale (Dahling et al., 2009) measures amorality (I am willing to be unethical if I believe it will help me succeed), desire for control (I enjoy having control over other people), desire for status (I want to be rich and powerful someday), and distrust of others (people are only motivated by personal gain). Responses to the 16 items are averaged together with obtainable scores ranging between 1 and 7, and higher scores mark increased endorsement of Machiavellian attitudes. The reliability of this measure was good (α = .88).

Results

T-test results revealed no significant differences between male and female scores for grit ($t(129) = -0.33$, $p = .743$), distress intolerance ($t(129) = -0.79$, $p = .434$), or Machiavellianism ($t(129) = 0.80$, $p = .424$). Similarly, one-way ANOVA results did not support a main effect of

ethnicity on grit ($F(6, 126) = 0.96$, $p = .459$), distress intolerance ($F(6, 126) = 0.98$, $p = .444$), or Machiavellianism ($F(6, 126) = 0.76$, $p = .601$). Because no significant differences were detected between sexes and ethnicities, all data was analyzed in the same mediation model excluding ethnicity as a covariate. Table 1 provides the descriptive statistics and zero-order correlations among the scales used.

Table 1. *Descriptive Statistics and Zero-Order Correlations for Variables in Study 1.*

	M	*SE*	1	2	3
1. Grit	3.17	0.05	-	-.24**	-.29†
2. Distress Intolerance	87.47	1.40	-.24**	-	.53†
3. Machiavellianism	4.14	0.99	-.29†	.53†	-

Note. $p < .05$, $^{**}p < .01$, $^{\dagger}p < .001$.

To examine if grit is associated with the callous and unethical attitudes of Machiavellianism and to consider the role of distress intolerance, a simple mediation model was tested. As recommended by Hayes (2009), 95% confidence interval bootstrapping with 1,000 iterations was used to assess the indirect effect. Results of the mediation analysis are shown in Figure 1. Without accounting for the mediator, increased grit was negatively associated with Machiavellianism, and grit also negatively predicted distress intolerance. After statistically adjusting for grit, higher levels of distress intolerance pertained to increased endorsement of Machiavellian attitudes. The indirect effect of grit on Machiavellianism through distress intolerance was significant ($B = -2.30$, $SE = 0.96$, 95% CI [-4.30, -0.52]), suggesting that Machiavellianism diminishes as grit increases as a result of, in part, a decrease in distress intolerance. The direct effect of grit on Machiavellianism remained significant and negative after adjusting for the indirect effect, so distress intolerance only partially mediates this relationship.

Therefore, grit mitigates Machiavellianism both independently and indirectly though distress intolerance, accounting for 31.1% of the variance in Machiavellianism combined (R^2 = .311).

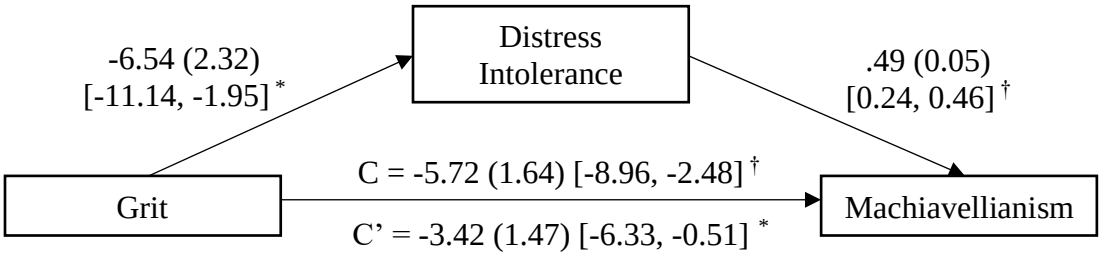

Figure 1. *Mediation Results for Study 1.*

Note. Values are unstandardized coefficients followed by standard errors in parenthesis and 95% confidence intervals in brackets.

*p < .05, †p < .001.

Discussion

The primary objective of Study 1 was to attempt to resolve previous contradictory reports of the relationship between self-reported grit and Machiavellianism and to consider distress intolerance as a mediating variable of the dichotomous morality between these characteristics. It was anticipated grit would negatively predict Machiavellianism, distress intolerance would be negatively associated with grit but positively related with Machiavellianism, and distress intolerance would at least partially mediate the relationship between grit and Machiavellianism. Results of the present study support all three of these hypotheses. Aligning with findings from Houston et al. (2020), mediation results suggested grit predicted reduced Machiavellianism, implying grit is a protective factor against amoral and callous behaviors. Distress intolerance, as hypothesized, indeed predicted lower grit but higher Machiavellianism. Further, the negative

relationship between these two variables was partially explained by the capacity to endure distress.

Therefore, academic and corporate interventions designed to foster grit and achievement (Alan et al., 2019; Vaart et al., 2021) are likely to reduce unethical behavior by changing rigidly intolerant beliefs surrounding negative affect. Communicating with other people, adjusting deadlines and expectations, pausing work on a task to continue later, and overcoming procrastination are stressful at times but unavoidable when pursuing a goal. By altering intolerant beliefs and developing participants' willingness to endure these inherent obstacles, individuals experience less distress when encountered with frustration. If individuals are better equipped to cope with frustration and distress, they may not resort to manipulating others, cheating, defecting, or other unethical means of achievement. Limitations and implications of these findings will be discussed in the general discussion. While the present study provides evidence of distress intolerance mediating the relationship between grit and Machiavellianism, it is important to replicate these results and to examine both behavioral and self-reported measures of distress intolerance. To this end, another study was conducted in order to attempt to replicate the results of Study 1, which also employed a behavioral measure of distress intolerance in order to help mitigate the bias intrinsic to analyzing self-report methods.

VII. STUDY 2

Results from Study 1 supported the mediational role of distress intolerance in the negative relationship between grit and Machiavellianism. This second study aimed to corroborate these results by assessing both self-reported and behavioral distress intolerance. To address limitations of existing assessments, performance on the video game "Getting Over It with Bennett Foddy" (Foddy, 2017) was validated as a task that may provide behavioral indices of distress intolerance that can then be examined for relationships with grit and Machiavellianism.

Method

Participants.

The sample consisted of 171 undergraduate students who were recruited through the Psychology Research Participation System at Texas State University, and participation satisfied course credit for an introductory psychology course. The sample was representative of psychology students at Texas State University with the average age being 18.68 years (*SD* = 1.70) and the majority having identified as female (70.8%) and Hispanic (35.7%), Caucasian (28.7%), Black or African American (12.3%), or multicultural (17.5%). All data collection was completed in a laboratory setting. Participants were guided to a quiet, isolated room where they first provided demographic information before completing all scales described in Study 1 in addition to a baseline affective states measure and another index of distress intolerance via Qualtrics (Seattle, WA). Following the completion of the survey, study personnel transitioned participants to the computer game "Getting Over It with Bennett Foddy." Participants were given a window of 30 minutes to attempt to complete the game but reassured they could stop playing whenever they became too fatigued, irritated, or simply uninterested. Participants were presented with casual puzzles, games, and mandala coloring pages located in the testing rooms as

alternative, anxiolytic activities (Eaton & Tieber, 2017; Pine et al., 2020) if they wished to stop engaging with the task before the allotted time expired. Gameplay was recorded using Xbox Game Bar, software default to recent Windows operating system versions, but audio or any visual recording of the participants themselves was not collected. When the 30 minute period elapsed, study personnel ended the screen recording and navigated participants to a second brief survey in which they identified their affective states during the task. This affective states measure was identical to the baseline affective state measure, but the language was adapted to focus on emotions experienced during the task. Missing data (less than 1%) was missing completely at random ($p > .999$) and addressed using listwise deletion. All procedures were approved by the Texas State University Institutional Review Board.

Measures.

The Grit (Duckworth et al., 2007; $\alpha = .75$), Machiavellian Personality (Dahling et al., 2009; $\alpha = .86$), and Frustration Discomfort scales (Harrington, 2005a; $\alpha = .92$) described in Study 1 were completed again and all had acceptable reliability coefficients.

Affective states. To assess affective state fluctuations and ensure frustration is elicited by "Getting Over It with Bennett Foddy" (Foddy, 2017), participants marked the presence of 19 emotions (frustration, satisfaction, boredom, etc.) on a 5- point scale ranging from 1 (*not at all*) to 5 (*extremely*) both preceding and following completion of the task. The included affective states were derived from previous studies (D'Mello & Graesser, 2012; Gross & Levenson, 1995; Meindl et al., 2019). Prior to completing the task, participants were asked to log their *current* emotions, and following completion, individuals indicated their affective states *while playing the game*. The language prefacing this scale was modified to emphasize consideration of affective states during these particular times.

Behavioral distress intolerance. Courtesy of Bennett Foddy (2017), the computer game "Getting Over It with Bennett Foddy" was employed to assess behavioral distress intolerance. This game requires players to move themselves through a challenging obstacle course using only the pivot point of a hammer (see Figure 2 for an example) which causes frequent setbacks and impedes goal attainment. Cursor sensitivity was set to the maximum possible value to further increase the difficulty while still preserving the opportunity to complete the game. Additionally, the narration, audio, and subtitles were turned off to maintain a controlled, distraction free environment. Gameplay (only actions visually displayed on the screen, not audio or any audiovisual recording of the participants themselves) was recorded, allowing for various aspects of performance to be quantified and considered as an index of distress intolerance. Three independent coders scored participants' number of screens passed, total playtime, number of setbacks, and furthest screen achieved. Using these metrics, playtime per screen passed was calculated as well. Ten percent of each coder's scores were compared to establish inter-rater reliability.

Figure 2. *Getting Over It with Bennett Foddy*.

Note. Participants move themselves over obstacles using only the pivot point of a hammer.

Screens passed. Instead of marking each object passed, obstacles were grouped into screens to help standardize scoring (see Figure 3 for an example). Each screen had an approximately similar number of obstacles (M = 2.05, SD = 0.79), and inter-rater reliability was excellent (99.5%).

A **B**

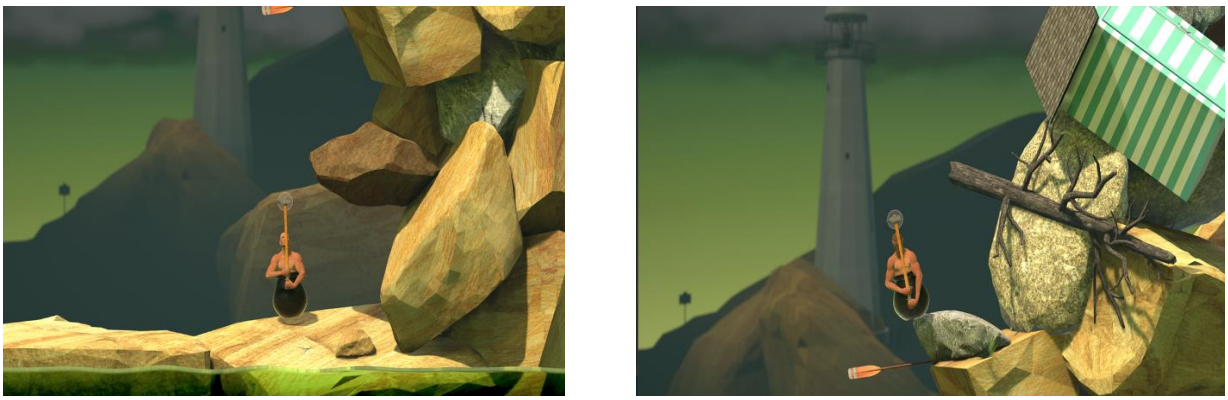

Figure 3. *Example of Obstacles Grouped into Screens.*

Note. Rather than counting individual hurdles surpassed, obstacles were grouped into screens. Picture A (screen 3) transitions into picture B (screen 4) upon navigating past the oar.

Total playtime. Playtime concluded at the participant's last attempted move or when the allotted 30 minutes had elapsed. Playtime, measured in minutes and seconds, was converted into minutes (For example, a playtime of 14 minutes and 20 seconds equates to 14.33 minutes). Inter-rater reliability for playtime was perfect (100%).

Playtime per screen. To elucidate the time given to overcoming thwarted progress (not gaining progress rather than experiencing a setback), participants' total playtime was divided by the number of screens passed. More time spent per screen suggests the participant exhibited moves and effort that resulted in neither improvement nor setbacks.

Setbacks. Participants' setbacks were counted to identify the number of times game progress was lost. Particularly, a setback was marked when an attempted move resulted in regressing to the beginning of the screen in which the attempted move occurred or to a point in any prior screen. Inter-rater reliability was excellent (98.5%).

Furthest screen achieved. Participants' furthest screen reached was logged as an objective measurement of performance and skill on the novel task. If participants achieved a more distant screen, they were assumed to have the higher skill level required to advance further compared to less adept participants. Inter-rater reliability was perfect (100%).

Self-reported distress intolerance. In addition to completing the Frustration Discomfort Scale (Harrington, 2005a) participants also completed a second, often interchangeable (Zvolensky et al., 2010) assessment of distress intolerance to help support construct and convergent validity of the novel behavioral measure. The Distress Tolerance Scale (Simons & Gaher, 2005) uses 15 items to evaluate four factors of distress intolerance: Tolerance ("Feeling distressed or upset is unbearable to me"), absorption ("When I feel distressed or upset, all I can think about is how bad I feel"), appraisal ("My feelings of distress or being upset scare me"), and regulation ("I'll do anything to stop feeling distressed or upset"). Responses are collected using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), and values are averaged together to score. Higher scores indicate more intolerance of distress. Reliability was acceptable for this measure ($\alpha = .90$).

Results

T-test results failed to identify gender differences within grit ($t(165) = 1.20$, $p = .232$), Machiavellianism ($t(164) = 1.17$, $p = .244$), or distress intolerance as measured through both the Frustration Discomfort Scale ($t(159) = 0.45$, $p = .654$) and Distress Tolerance Scale ($t(164) = -1.48$, $p = .140$). However, one-way ANOVA results revealed ethnic differences for grit ($F(4, 162) = 2.79$, $p = .028$) and Machiavellianism ($F(4, 161) = 3.63$, $p = .007$) but not for outcomes on the Frustration Discomfort Scale ($F(4, 156) = 0.27$, $p = .900$) or Distress Tolerance Scale ($F(4, 161) = 0.13$, $p = .973$). Tukey post-hoc tests suggest Hispanic participants ($M = 3.26$, $SE =$

0.07) were grittier than multicultural participants (M = 2.92, SE = 0.08; MD = 0.34, SE = 0.12, p = .038, 95% CI [0.01, 0.68]), and Hispanic participants (M = 2.82, SE = 0.09) were more Machiavellian than Caucasian participants (M = 2.42, SE = .08; MD = 0.39, SE = 0.13, p = .017, 95% CI [0.05, 0.74]). No other ethnic differences were detected. To remedy this, ethnicity is included as a covariate in the mediation models employing grit and Machiavellianism. All descriptive statistics and zero-order correlations are displayed in Table 2.

Table 2. *Descriptive Statistics and Zero-Order Correlations for Variables in Study 2.*

	M	*SD*	1.	2.	3.	4.	5.	6.	7.	8.
1. Grit	3.15	0.55								
2. Machiavellianism	2.57	0.66	-.07							
3. DTS	2.98	0.83	-.27**	.25**						
4. FDS	80.83	18.75	-.19*	.45**	.68**					
5. Screens Passed	37.60	21.94	-.04	.12	.04	.03				
6. Playtime	27.80	5.50	-.04	-.02	-.04	-.05	.44**			
7. Time per Screen	1.29	1.80	.05	-.02	.02	.06	-.54**	-.11		
8. Setbacks	55.28	25.27	-.05	.10	.14	.09	.84**	.54**	-.49**	
9. Furthest Screen Achieved	7.94	3.37	-.12	.10	-.05	-.04	.68**	.27**	-.44**	.38**

Note. DTS = Distress Tolerance Scale and FDS = Frustration Discomfort Scale.

*p < .05, **p < .01

Self-report distress intolerance mediation models.

To compare with the results in Study 1 addressing the mediational role of distress intolerance on the relationship between grit and the callous behaviors associated with Machiavellianism, separate mediation models using the Frustration Discomfort Scale and Distress Tolerance Scale were examined (see Figure 4 and Figure 5 respectively for regression coefficients). 95% percentile bootstrapping using 1,000 iterations was applied to assess the indirect effects (Hayes, 2009). The total effect of grit on Machiavellianism was nonsignificant, as grit failed to predict Machiavellianism. Employing the Frustration Discomfort Scale, grit was

negatively associated with distress intolerance, and, in turn, distress intolerance was associated with increased endorsement of Machiavellian attitudes when adjusting for grit. Grit still failed to predict Machiavellianism when adjusting for distress intolerance, but the indirect effect through distress intolerance was significant (*B* = -0.10, *SE* = 0.04, 95% CI [-0.19, -0.02]). The overall model accounted for 27.4% of the variance in Machiavellianism (R^2 = .274). Similar results were obtained when Distress Tolerance Scale scores were used to assess distress intolerance, as the indirect effect was again significant (*B* = -0.07, *SE* = 0.03, 95% CI [-0.13, -0.02]). The model considering the Frustration Discomfort Scale accounted for approximately 15.1% of the variance in Machiavellianism (R^2 = .151).

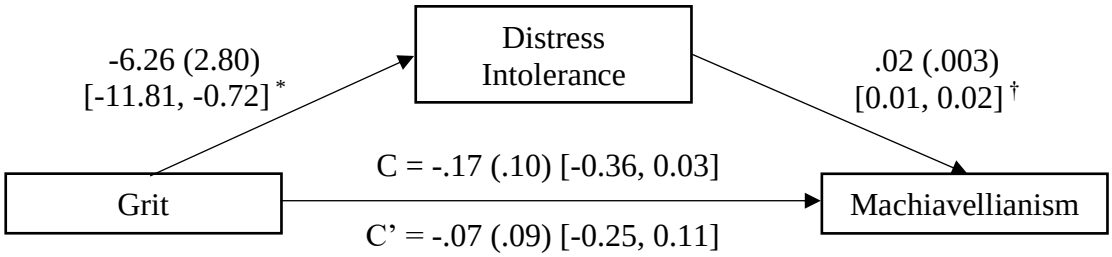

Figure 4. *Mediation Results Using the FDS.*

Note. FDS = Frustration Discomfort Scale. Values are unstandardized coefficients followed by standard errors in parentheses and 95% confidence intervals in brackets.

*$p < .05$, †$p < .001$.

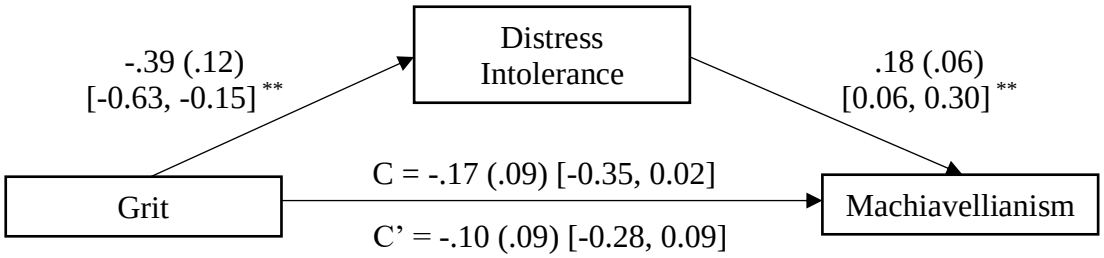

Figure 5. *Mediation Results Using the DTS.*

Note. DTS = Distress Tolerance Scale. Values are unstandardized coefficients followed by standard errors in parentheses and 95% confidence intervals in brackets.

***p* < .01

Manipulation check.

To ascertain if the proposed novel task successfully changed affective states and induced distress, pre-task and post-task affective state ratings were compared using paired samples *t*-tests (see Table 3). Frustration, anger, unhappiness, confusion, embarrassment, disgust, surprise, and satisfaction increased during completion of the task. Further, joy, love, happiness, and sadness decreased throughout the duration of the video game, and anxiety, shame, contempt, fear, guilt, interest, and pride remained relatively consistent.

Table 3. *Paired Samples t-Test Results for Pre- and Post-Task Affective States.*

	Pre-Task *M* (*SD*)	Post-Task *M* (*SD*)	*MD*	95% CI	*d*	*p*
Frustration	1.61 (1.05)	3.73 (1.23)	-2.12	-2.34, -1.89	-1.43	< .001
Anger	1.38 (0.78)	2.72 (1.37)	-1.34	-1.57, -1.12	-0.90	< .001
Surprise	1.49 (0.84)	2.59 (1.30)	-1.10	-1.31, -0.88	-0.77	< .001
Confusion	1.73 (0.97)	2.47 (1.28)	-0.73	-0.96, -0.52	-0.51	< .001
Unhappiness	1.63 (0.96)	2.15 (1.26)	-0.52	-0.75, -0.29	-0.34	< .001
Satisfaction	2.28 (1.20)	2.78 (1.33)	-0.50	-0.75, -0.25	-0.31	< .001
Embarrassment	1.32 (0.74)	1.54 (0.98)	-0.22	-0.41, -0.03	-0.18	.023
Disgust	1.18 (0.59)	1.37 (0.92)	-0.20	-0.35, -0.03	-0.18	.021
Interest	3.28 (1.13)	3.44 (1.30)	-0.15	-0.37, 0.06	-0.11	.160
Shame	1.27 (0.81)	1.37 (0.84)	-0.10	-0.27, 0.07	-0.09	.234
Pride	2.19 (1.23)	2.25 (1.26)	-0.05	-0.27, 0.17	-0.04	.635
Contempt	2.14 (1.22)	2.02 (1.19)	0.13	-0.11, 0.36	0.08	.297
Fear	1.47 (0.90)	1.35 (0.84)	0.12	-0.05, 0.30	0.11	.156
Anxiety	2.31 (1.27)	2.10 (1.31)	0.21	-0.03, 0.45	0.13	.092
Guilt	1.26 (0.77)	1.13 (0.52)	0.13	-0.01, 0.27	0.14	.065
Sadness	1.81 (1.00)	1.52 (0.89)	0.29	0.10, 0.48	0.23	.003
Joy	2.73 (1.21)	2.38 (1.27)	0.36	0.15, 0.56	0.26	.001
Happiness	3.27 (1.06)	2.49 (1.16)	0.78	0.56, 1.00	0.55	< .001
Love	2.82 (1.31)	1.48 (0.90)	1.34	1.13, 1.55	0.98	< .001

Note. MD = mean difference. Affective states are arranged by effect size with the largest increase at the top and largest decrease at the bottom.

Task performance and distress intolerance.

Aiming to determine the relationship between behaviors associated with the novel behavioral task and self-reported distress intolerance, metrics of task performance (furthest screen achieved, number of screens passed, number of setbacks, playtime, and playtime per screen) were included in a regression model predicting self-report distress intolerance. Separate regression models were calculated using the Frustration Discomfort Scale and Distress Tolerance Scale to provide evidence of convergent validity for the novel task. When all predictors were entered into the regression models, a multicollinearity issue arised from including the total number of screens passed (variance inflation factor = 7.41 and 7.14 respectively). Removing the

number of screens passed resolved this issue and returned all variance inflation factors to an appropriate window. Regression coefficients, excluding total number of screens passed, are presented in Table 4 (Frustration Discomfort Scale) and Table 5 (Distress Tolerance Scale). When regressing Frustration Discomfort Scale scores onto task performance, the total number of setbacks positively predicted distress intolerance. However, furthest screen achieved, total playtime, and playtime per screen were not significantly associated with distress intolerance. When examining the relationship between scores on the Distress Tolerance Scale and task performance, both number of setbacks and playtime emerged as significant predictors. As such, the number of setbacks was again positively related to distress intolerance, and longer playtime predicted lower distress intolerance. Furthest screen achieved and playtime per screen remained nonsignificant.

Table 4. *Predicting FDS Scores from Task Performance*.

$F(4, 150) = 1.70$, $p = .153$, $R^2 = .04$

	B	*SE*	β	*p*	95% CI
Furthest Screen	-0.15	0.50	-.03	.766	-1.14, 0.84
Setbacks	0.20	0.08	.27	.016	0.04, 0.36
Playtime	-0.56	0.33	-0.17	.090	-1.20, 0.09
Time/Screen	1.66	1.00	0.17	.101	-0.33, 3.64

Note. FDS = Frustration Discomfort Scale.

Table 5. *Predicting DTS Scores from Task Performance*.

$F(4, 154) = 2.41$, $p = .051$, $R^2 = .06$

	B	*SE*	β	*p*	95% CI
Furthest Screen	-0.19	0.02	-.08	.404	-0.6, 0.03
Setbacks	0.01	0.004	.32	.003	0.004, 0.02
Playtime	-0.03	0.01	-0.19	.050	-0.33, 0.000
Time/Screen	0.06	0.04	0.12	.220	-0.03, 0.14

Note. DTS = Distress Tolerance Scale.

Behavioral distress intolerance mediation model.

Since total playtime and number of setbacks emerged as significant predictors of distress intolerance, they were entered into a parallel mediation model further examining the relationship between grit and Machiavellianism. Furthest screen achieved and playtime per screen were included as covariates, as well as ethnicity to account for differences within grit and Machiavellianism, to provide the same relationship which yielded associations between task performance and distress intolerance (see Figure 6 for regression coefficients). The parallel mediation model revealed no significant pathways. As such, grit failed to predict Machiavellianism, playtime, and number of setbacks. In turn, both metrics of task performance were unrelated to Machiavellianism, and, similarly, both the indirect effects of grit on Machiavellianism through total playtime (B = 0.003, SE = 0.01, 95% CI [-0.03, 0.03]) and number of setbacks (B = -0.001, SE = 0.01, 95% CI [-0.03, 0.03]) were nonsignificant. The total model accounted for 12.6% of the variance in Machiavellianism (R^2 = .126).

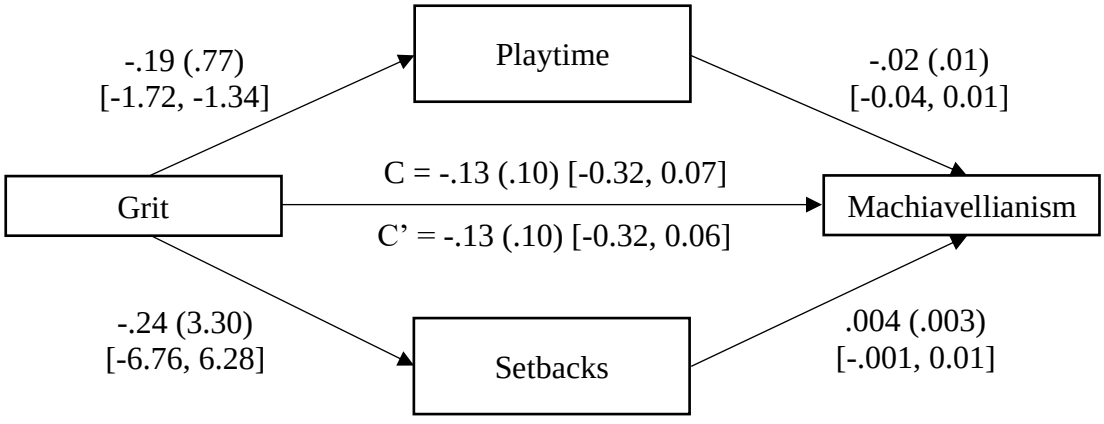

Figure 6. *Indirect Effects of Behavioral Distress Intolerance Indices.*

Note. Values are unstandardized coefficients followed by standard errors in parentheses and 95% confidence intervals in brackets.

Discussion

The first objective of the present study was to examine if excessive perseverance, as seen in elevated levels of grit, predicts the characteristics associated with Machiavellianism while considering the mediational role of distress intolerance in this relationship. A priori hypotheses included grit negatively predicting Machiavellianism, distress intolerance being negatively associated with grit but positively with Machiavellianism, and distress intolerance at least partially mediating the relationship between grit and Machiavellianism. Overall, hypothesis one was not supported as separate mediation models employing the Frustration Discomfort Scale and another utilizing the Distress Tolerance Scale failed to identify a total effect of grit on Machiavellianism. Contradictory to previous studies (Arli et al., 2020; Houston et al., 2020), this suggests grit, in any capacity, may be unrelated to amoral and manipulative behaviors and attitudes. However, hypotheses two and three were supported as distress intolerance was negatively related to grit, positively associated with Machiavellianism, and mediated the relationship between grit and Machiavellianism. Results suggest grit is unrelated to Machiavellianism, but it is, however, associated with more tolerance of distress which is, in turn, related to reduced Machiavellianism. Similar results were obtained using both the Frustration Discomfort Scale (Harrington, 2005a) and Distress Tolerance Scale (Simons & Gaher, 2005), although the model fit was higher when employing the Frustration Discomfort Scale. The difference in model fit may be a result of slight differences between the scales; the Frustration Discomfort Scale assess specific content of intolerant beliefs (Harrington, 2005a) while the Distress Tolerance Scale measures the lower order factors of distress intolerance (Simons & Gaher, 2005). Differences in particular beliefs likely better predicted Machiavellian attitudes, resulting in a better model fit. Together, these results present further evidence that higher levels

of grit likely do not lead to Machiavellian attitudes; therefore, interventions that cultivate grit (e.g., Alan et al., 2019; Vaart et al., 2021) should not generate Machiavellian tendencies. These results are further discussed in the general discussion.

The second objective of the present study was to examine the video game "Getting Over It with Bennett Foddy" (Foddy, 2017) as a novel measure of behavioral distress intolerance. It was anticipated that engaging with this task would elicit frustration, anger, and satisfaction, and this was partially supported, as these affective states did indeed increase as a result of interacting with the game. The challenging task elicited frustration and anger more than any other affective state, and satisfaction likely increased as a byproduct of attitudes towards playing a video game. Given video games are a common form of personal entertainment and leisure (Entertainment Software Association, 2022), participants may have experienced elevated satisfaction from simply playing a video game, in spite of the negative affect being induced. Contradictory to hypotheses, although similar to previous studies (Gross & Levenson, 1995; Meindl et al., 2019), other emotions also fluctuated. Unhappiness, confusion, embarrassment, disgust, and surprise also increased while engaging with the paradigm, and levels of joy, love, happiness, and sadness decreased. The breadth of affective states altered by the task supports the notion proposed by Gross & Levenson (1995), that stimuli rarely elicit discriminant emotions. Regardless, the changes in affective states support the hypothesis that the task would prompt frustration and anger while minimally improving satisfaction. Because the task successfully elicited distress, facets of performance can then be indexed and compared to self-reported distress intolerance to consider if they might serve as proxies for self-report measures.

Next, to determine if "Getting Over It with Bennett Foddy" (Foddy, 2017) relates to self-reported distress intolerance, aspects of task performance (total playtime, playtime per screen,

and number of setbacks) were analyzed using regression models predicting self-reported distress intolerance. Separate models utilizing Frustration Discomfort Scale scores and Distress Tolerance Scale scores were examined to support converging validity of emerging relationships between performance on the novel task and self-reported distress intolerance. Results of these regression models support a relationship between task performance and self-reported distress intolerance. More specifically, the number of setbacks was associated with higher scores on both the Frustration Discomfort Scale and Distress Tolerance Scale, but total playtime was negatively related to only scores on the Distress Tolerance Scale. The direction of the relationship between total playtime and self-reported distress intolerance aligned with a priori hypotheses. Supporting previous studies that have operationalized time spent engaging with a distressing task as distress intolerance (Brown et al., 2009; Daughters et al., 2005; Meidnl et al., 2018; Rai & Gupta, 1988), results of the current study suggest longer playtime on the task predicted an improved ability to endure distress. Since the video game successfully elicited distress, time spent withstanding this negative affect is an intuitive and expected predictor of distress intolerance.

In contrast, the positive relationship between the number of setbacks and self-reported distress intolerance deviated from expectations. By definition, loss of progress towards goal attainment is distressing (Anderson & Bushman, 2002; Dill & Anderson, 1995), so it was predicted that persevering in spite of encountering setbacks would be indicative of lower distress intolerance. Interestingly, while scoring the screen recordings of task performance, participants were frequently observed to awkwardly attempt moves in a more rapid manner following a setback compared to their pace before the loss of progress. Because these attempted moves were noticeably uncoordinated, they seemed to cause multiple subsequent setbacks until participants returned to a steady, apparently calm pace. These exhibitions of poor emotion regulation, a lower

order factor of distress intolerance (Simons & Gaher, 2005), may explain the unexpected positive relationship between number of setbacks and self-reported distress intolerance (as assessed by both scales).

Similar, but not identical, results were obtained when using both the Frustration Discomfort Scale (Harrington et al., 2005) and Distress Tolerance Scale (Simons & Gaher, 2005). The unexpected difference in significant predictors may be a result of the Distress Tolerance Scale assessing the factor structure comprising distress intolerance (Simons & Gaher, 2005) while the Frustration Discomfort Scale identifies specific content of intolerant beliefs (Harrington, 2005a). While often highly correlated and used interchangeably as measures of self-report distress intolerance (Zvolensky et al., 2010), these conceptual differences may explain the distinct relationships between task performance and each of the distress intolerance survey measures. Despite this, the standardized beta values for total playtime are similar between the two models, suggesting an approximately equivalent relationship between total playtime and the two measurements of distress intolerance. This implies that, regardless of the coefficient's significance, total playtime on the task is related to self-reported distress intolerance. Overall, total playtime and the number of setbacks emerging as predictors of self-reported distress intolerance partially supports the hypothesis that task performance would be related to self-reported distress intolerance. However, since the other metrics of performance did not predict self-reported distress intolerance, additional behaviors and indices should be considered in future research. This future direction will be further discussed in the general discussion.

Finally, it was hypothesized that facets of task performance that relate to self-reported distress intolerance (playtime and setbacks) would mediate the relationship between grit and Machiavellianism. This hypothesis was not supported since neither the indirect effect of total

playtime nor number of setbacks was significant. The null relationships between grit, Machiavellianism, total task playtime, and number of setbacks experienced may be explained by poor expectations of the value for engaging with the proposed task. Motivation partially hinges on the perceived value of completing a specified goal (Behling & Starke, 1973; Lucas et al., 2015; Mirkovic & Bianchi, 2019), so participants failing to identify subjective merit in engaging with the proposed task may explain why task performance was unrelated to the grit and Machiavellianism, two approaches to goal attainment. Further, since the behavioral indicators of distress intolerance did not mirror those obtained with self-report measures, the novel task may be assessing a closely related yet distinct construct from distress intolerance, like emotion regulation or experiential avoidance (Blakey et al., 2015; McHugh et al., 2013). Limitations and implications of these results will be discussed further in the general discussion.

VII. GENERAL DISCUSSION

Grit is extensively associated with achievement (Bowman et al., 2014; Duckworth et al., 2007; Duckworth et al., 2011; Kannangara et al., 2018; Strayhorn, 2013), and in general, is considered a beneficial trait that should be cultivated. However, grit has also been associated with cognitive inflexibility (Lucas et al., 2015; Kalia et al., 2019), which could potentially give rise to maladaptive behaviors. As such, although grit describes tenacious persistence, recent studies (Arli et al., 2020; Houston et al., 2020) have questioned if an excessive focus on achievement, as indicated by higher levels of grit, could promote the use of deceitful, Machiavellian tactics during goal attainment. However, previous reports have revealed both a positive (Arli et al., 2020) and negative (Houston et al., 2020) relationship between grit and Machiavellianism. Furthermore, the role of distress intolerance has not been considered in this relationship, which may help to reconcile inconsistencies across studies. If the capacity to withstand negative affect is critical for prosocial and moral behavior (Bies & Tripp, 2005; De Clercq et al., 2021; Matheny et al., 2017; Merchant & Lundell, 2001) and psychological well-being (Brown et al., 2005; Corstorphine et al., 2007; Ellis, 1979, 1980; Filippello et al., 2018; Gross & Munoz, 1995; Linehan, 1993; Keough et al., 2010; Williams et al., 2015), then individual differences in distress intolerance may explain why certain individuals persist while remaining ethical in the face of challenges and others resort to cheating or manipulation to attain their goals. Given the discrepancies across studies examining the relationship between Machiavellianism and grit, the current project, comprised of two studies, aimed to clarify the association between grit and Machiavellianism and to consider the mediational role of distress intolerance in this relationship. A secondary aim was to develop and test a behavioral measure of distress intolerance to determine if a new behavioral index of distress intolerance could be

developed that shares the same interrelationships with grit and Machiavellianism as those identified using self-report measures.

With these aims in mind, it was hypothesized that grit would negatively predict levels of Machiavellianism. Aligning with previous reports (Houston et al., 2020), results of Study 1 support a negative relationship between grit and Machiavellianism, but Study 2 diverges from this trend and illuminates a nonsignificant association. The regression coefficients in Study 2 followed the same negative trend as in Study 1, but the confidence intervals slightly overlapped with zero, suggesting a null association. No explanation is readily available for this difference between Study 1 and Study 2; Additional research is needed to clarify the relationship, if any, between grit and Machiavellianism. In combination, these results mostly align with reports from Houston et al. (2020) which posit a heightened focus on goal attainment likely does not inherently produce manipulative and amoral behaviors, such as cheating, sabotaging others, or defecting from interpersonal relationships. Nevertheless, further research is needed to clarify the nature of the relationship between grit and Machiavellianism, since it remains unclear whether there is indeed a direct negative relationship between grit and Machiavellianism.

Next, it was hypothesized that self-reported distress intolerance would negatively predict grit, have a positive association with Machiavellianism, and at least partially mediate or account for the relationship between grit and Machiavellianism. Both studies support all three of these hypotheses. Specifically, the indirect effects of distress intolerance on the relationship between grit and Machiavellianism was significant, suggesting grit is ultimately associated with an improved tolerance of negative affect. Lower distress intolerance, in turn, is a protective factor from Machiavellian attitudes, extending previous accounts of the importance for tolerating distress in prosocial behavior (Bies & Tripp, 2005; De Clercq et al., 2021; Matheny et al., 2017;

Merchant & Lundell, 2001). As presented by Houston et al. (2020), academic and corporate interventions aimed at improving grit (e.g., Alan et al., 2019; Vaart et al., 2021) are not likely to produce Machiavellian individuals because cultivating and displaying resilience necessitates tolerance of negative affect which reduces antisocial strategies like cheating, theft, antagonistic knowledge withholding, and defecting from interpersonal relationships (Bies & Tripp, 2005; De Clercq et al., 2021; Matheny et al., 2017; Merchant & Lundell, 2001). Grit interventions train individuals to set attainable milestones, effectively manage their time, and engage with available resources to achieve desired goals (Alan et al., 2019; Vaart et al., 2021). Results from the present studies suggest that, by altering distress intolerance, these interventions better equip clients to ethically pursue their goals rather than employing amoral methods to achieve despite the costs.

The second goal of the current project was to validate "Getting Over It with Bennett Foddy" (Foddy, 2017) as a novel behavioral measure of psychological distress intolerance. Existing assessments (PASAT, MTFT-C, unsolvable anagrams, etc.) suffer from limitations which skew relationships between task performance and self-report measures of distress intolerance (Ameral et al., 2014; Cougle et al., 2013; Leyro et al., 2010; McHugh & Otto, 2011; Meindl et al., 2019; Zvolensky et al., 2010). Specifically, Ameral et al. (2020) found that poor control over task outcomes causes participants to set meaningless goals (i.e., only attempting a few items rather than aspiring to complete the entire task) or cease participation entirely. In other words, participants recognize that these paradigms are essentially rigged to induce frustration and distress through uncontrollable means, such as random cursor drift when tracing a shape or negative feedback to a response that the participant knows is correct. This realization may reduce motivation to engage with the tasks and distort the data regarding the participants' distress intolerance. In other words, existing tasks seem to be measuring how quickly the participant

perceives them as impossible to complete rather than how much distress the participant can tolerate. These limitations illustrate the need for a novel assessment of behavioral distress intolerance.

The present study assessed the computerized video game "Getting Over It with Bennett Foddy" (Foddy, 2017) in aims of addressing these limitations. Because people are more likely to have engaged with a video game versus situations comparable to existing behavioral distress intolerance paradigms (Entertainment Software Association, 2022), performance on the proposed task may better reflect real-world persistence through distress. Additionally, the novel task, while challenging, is not overwhelmingly difficult or impossible to complete and allows participants to learn effective strategies, adjust their gameplay, and have relative control over measured outcomes. Setbacks in progress are not contrived through task design (e.g., random cursor drift or increasingly rapid presentation of stimuli), but are instead a direct product of participant decision-making and behaviors. Thus, participants are given more control over their performance; an error results in loss of progress, but a successful string of movements depicts goal attainment and reduced distress. Compared to tasks that hinder participant performance or wrongfully present negative feedback following a successful trial, the task used in Study 2 better resembles performance-based fluctuations in progress and distress inherent to accomplishing a long-term objective. Participants may be intrinsically motivated to persist if they are confident their progression is a direct result of their merit and skillful gameplay. Overall, "Getting Over It with Bennett Foddy" (Foddy, 2017) addresses ecological limitations of other behavioral measures because it is a difficult, but not impossible, endeavor. As such, the proposed novel task is better aimed at measuring distress intolerance because perceived control is an integral component of maintaining goal oriented behaviors in the face of adversity, like when managing a

chronic illness (Berglund et al., 2014) or enduring racial discrimination (Uomoto, 1986).

In validating "Getting Over It with Bennett Foddy" (Foddy, 2017), it was first anticipated that engaging with the task would elicit frustration, anger, and satisfaction as a byproduct of playing a video game. Indeed, results from Study 2 support engaging with the novel task successfully elicited frustration and anger more than any other affective state while also incrementally increasing satisfaction. However, other affective states shifted as well, though to a lesser extent, because stimuli rarely impact a single affective state (Gross & Levenson, 1995; Meindl et al., 2019). Regardless, the direction of change for each affective state supports the task created distress within participants. Because the task elicited distress, facets of task performance could be measured and compared to self-reported distress intolerance to examine if they serve as behavioral proxies.

Next, it was hypothesized that metrics of performance on "Getting Over It with Bennett Foddy" (Foddy, 2017; furthest screen achieved, number of screens passed, number of setbacks, playtime, and playtime per screen) would be associated with lower distress intolerance. Total task playtime and number of setbacks experienced, but no other performance metric, emerged as significant predictors of self-reported distress intolerance. Similar to previous studies operationalizing time spent interacting with an irritating task as distress intolerance (Brown et al., 2009; Daughters et al., 2005; Meidnl et al., 2018; Rai & Gupta, 1988), more time spent on the task suggested a higher willingness to endure negative affect. However, suffering a higher number of setbacks unexpectedly predicted worsened tolerance for distress. Given frustration is a negative affective state resulting from thwarted goal attainment (Anderson & Bushman, 2002; Dill & Anderson, 1995), it was expected that experiencing more setbacks would illustrate tolerating more distress. Interestingly, participants often exhibited rapid, uncontrolled

movements after a setback which quickly led to additional loss of progress. This observation suggests the behavior following a setback may be more closely related to emotion regulation, a lower order factor of distress intolerance (Simons & Gaher, 2005), rather than the higher order construct of distress intolerance. Additionally, though playtime and number of setbacks did predict self-reported distress intolerance, other behavioral patterns associated with performance (e.g., total attempted moves or change of pace following a setback) may present stronger relationships with self-reported distress intolerance. The implications of these findings and conclusions on future research will be discussed below. While the relationship between self-reported distress intolerance and both playtime and number of setbacks supports the a priori hypothesis, additional research is needed to determine the most salient relationships between performance on "Getting Over It with Bennett Foddy" (Foddy, 2017) and self-reported distress intolerance.

Given the relationship between task performance and self-reported distress intolerance, it was hypothesized that behavioral distress intolerance (metrics of task performance related to self-reported distress intolerance: total playtime and number of setbacks) would mediate the relationship between grit and Machiavellianism, replicating the same interrelationships as with self-reported distress intolerance. However, against expectations, these metrics did not effectively substitute as mediators, as neither the indirect effect of total playtime nor number of setbacks significantly accounted for the relationship between grit and Machiavellianism. This deviates from results of previous studies documenting relationships between behavioral distress intolerance and both grit (Meindl et al., 2019) and Machiavellianism (Rai & Gupta, 1988). Given that behavioral tasks measure an *objective* ability to tolerate distress and self-report measures assess *perceived* distress intolerance, it is possible one's perceived self-efficacy to endure

negative affect accounts for the relationship between grit and Machiavellianism, but not their objective distress intolerance. Aligning with notions presented by Zvolensky et al. (2010), this suggests distress intolerance may be a higher order construct comprised of perceived distress intolerance and objective ability to tolerate distress, and, therefore, these lower order factors might exhibit different relationships with grit, Machiavellianism, and other relevant variables.

These results and implications present myriad directions for future research employing "Getting Over It with Bennett Foddy" (Foddy, 2017). Most importantly, given neither facet of performance accounted for the relationship between grit and Machiavellianism and number of setbacks unexpectedly positively related with self-reported distress intolerance, subsequent studies should examine the nomological network (related constructs) associated with performance on the presented task, such as emotion regulation strategies, substance use history and motives, and experiential avoidance. Given previously documented relationships between distress intolerance and these constructs (Blakey et al., 2015; Brown et al., 2005; McHugh et al., 2013), exploring correlates of performance on "Getting Over it With Bennett Foddy" (Foddy, 2017) would provide evidence of construct validity and further elucidate if the task truly assesses distress intolerance.

Future research may also benefit from considering how other behavioral patterns during task engagement relate to self-reported distress intolerance. For example, participants were frequently observed vocalizing displeasure or hitting the desk and surrounding materials. Employing audiovisual recording of the participant and other means to quantify these patterns may reveal additional relationships between task performance and self-reported distress intolerance. These behaviors may also help to isolate periods of gameplay when frustration was high, allowing for the development of better metrics of distress intolerance. Similarly, some

facets of performance, like number of attempted moves or change of pace following a setback, were impossible to quantify given the available technology and resources. Devising better behavioral metrics for the task could also yield associations between task performance and the capacity to withstand negative affect.

Similarly, while self-reported emotional states were used as evidence that the task induced frustration and distress, incorporating physiological indicators of distress and frustration, like salivary cortisol levels would provide objective evidence to support this conclusion. The use of cardiovascular measures such as heart rate, heart-rate variability/vagal tone, and blood pressure, could also be used as objective markers of distress (Miller et al., 2007; Vrijkotte et al., 2000) and may help to isolate discrete frustrating events like setbacks, so that behaviors during these periods can be examined more closely as potential indices of frustration. Recording vocalizations and facial expressions during the task may also help to isolate and quantify negative affect. These measurements may be more sensitive to moment-to-moment changes in distress, which could help to clarify relationships between task performance and self-reported distress intolerance.

Additionally, future endeavors may also benefit from examining the relationship between grit and specific amoral behaviors to better address if a sole concern for achievement directly breeds Machiavellian attitudes. For example, rather than examining if grit relates to Machiavellianism broadly, it may be useful to consider the association between grit and particular Machiavellian behaviors, such as lying to or sabotaging others, defecting from interpersonal relationships, and cheating. Identifying if any specific antisocial behaviors are associated with excessive grit could help inform existing grit interventions (Alan et al., 2019; Vaart et al., 2021) to foster goal attainment strategies in a more prosocial manner. Finally, since

all analyzed data was cross-sectional, the purported mediation pathways should be examined using longitudinal designs. By establishing temporal precedence, a longitudinal design would better assess causal relations between grit, Machiavellianism, and distress intolerance. This would help clarify if elevated grit causes Machiavellian behaviors and if distress intolerance mediates this causal process. Employing a longitudinal design also presents the opportunity to examine test-retest reliability of the task, which would support the task's utility in assessing distress intolerance fluctuations in relevant academic, occupational, and clinical settings.

In summary, the current project aimed to clarify if a robust focus on achievement predicts Machiavellian ideology and if an unwillingness to tolerate distress accounts for the use of amoral tactics. A priori hypotheses were supported by the results of both studies, which did not find that elevated grit was positively associated with Machiavellianism. However, whether grit may be a protective factor against cheating, sabotaging, and manipulating circumstances for personal gain remains uncertain. Nevertheless, results suggest that interventions targeting grit and resilience (Alan et al., 2019; Vaart et al., 2021) are not likely to encourage antisocial goal attainment strategies because they foster participants' capacities to withstand the negative affect integral to identifying and achieving objectives. In addition, Study 2 provided preliminary evidence for the utility of a novel behavioral measure of distress intolerance, "Getting Over It with Bennett Foddy" (Foddy, 2017). Analyses from Study 2 suggest the task successfully elicited negative affect, and playtime and number of setbacks experienced were identified as significant predictors of self-reported distress intolerance. This implies the proposed task may be a useful behavioral method to assess a person's distress intolerance. Although closer, more systematic examinations of the task may yield better behavioral indices of distress, both total play time and number of setback were significantly associated with self-reported distress intolerance. Ranging from

employment or academic screenings to therapeutic contexts, the novel paradigm could provide insight on an individual's capacity to effectively tolerate frustration and distress in real-world circumstances.

References

Abramowski, A. (2018). Is procrastination all that "bad"? A qualitative study of academic procrastination and self-worth in postgraduate university students. *Journal of Prevention & Intervention in the Community*, *46*(2), 158-170.

Ahmad, S. I., Malik, S., & Jumani, N. B. (2018). Academic procrastination: An exploration for the cause at university level. *International Journal of Innovation in Teaching and Learning (IJITL)*, *4*(1).

Alan, S., Boneva, T., & Ertac, S. (2019). Ever failed, try again, succeed better: Results from a randomized educational intervention on grit. *The Quarterly Journal of Economics*, *134*(3), 1121-1162.

Anderson, C. A., & Bushman, B. J. (2002). Human aggression. *Annual Review of Psychology*, *53*(1), 27-51.

Antonovsky, A. (1993). The structure and properties of the sense of coherence scale. *Social Science & Medicine*, *36*(6), 725-733.

Ameral, V., Palm Reed, K. M., Cameron, A., & Armstrong, J. L. (2014). What are measures of distress tolerance really capturing? A mixed methods analysis. *Psychology of Consciousness: Theory, Research, and Practice*, *1*(4), 357.

Arli, D., Tjiptono, F., Tkaczynski, A., & Bakpayev, M. (2020). Grit: the good, the bad and the ugly. *Asia Pacific Journal of Marketing and Logistics*, *33*(5), 1270-1285.

Arya, B., & Lal, D. S. (2018). Grit and sense of coherence as predictors of well-being. *Indian Journal of Positive Psychology*, *9*(1), 169-172.

Behling, O., & Starke, F. A. (1973). The postulates of expectancy theory. *Academy of Management Journal*, *16*(3), 373-388.

Bies, R. J., & Tripp, T. M. (2005). The study of revenge in the workplace: Conceptual, ideological, and empirical issues. In S. Fox & P. E. Spector (Eds.), *Counterproductive work behavior: Investigations of actors and targets* (pp. 65–81). Washington, DC: American Psychological Association.

Birkás, B., Csathó, Á., Gács, B., & Bereczkei, T. (2015). Nothing ventured nothing gained: Strong associations between reward sensitivity and two measures of Machiavellianism. *Personality and Individual Differences, 74*, 112-115.

Blakey, S. M., Jacoby, R. J., Reuman, L., & Abramowitz, J. S. (2015). The relative contributions of experiential avoidance and distress tolerance to OC symptoms. *Behavioural and Cognitive Psychotherapy, 44*(4), 460–471.

Bowman, N. A., Hill, P. L., Denson, N., & Bronkema, R. (2015). Keep on truckin' or stay the course? Exploring grit dimensions as differential predictors of educational achievement, satisfaction, and intentions. *Social Psychological and Personality Science, 6*(6), 639-645.

Brown, R. A., Lejuez, C. W., Kahler, C. W., Strong, D. R., & Zvolensky, M. J. (2005). Distress tolerance and early smoking lapse. *Clinical Psychology Review, 25*(6), 713-733.

Brumbach, B. H., Figueredo, A. J., & Ellis, B. J. (2009). Effects of harsh and unpredictable environments in adolescence on development of life history strategies. *Human Nature, 20*(1), 25-51.

Berglund, E., Lytsy, P., & Westerling, R. (2014). The influence of locus of control on self-rated health in context of chronic disease: a structural equation modeling approach in a cross sectional study. *BMC Public Health, 14*, 1-9.

Christie, R., & Geis, F. L. (1970). *Studies in Machiavellianism.* Academic Press.

Cooper, S., & Peterson, C. (1980). Machiavellianism and spontaneous cheating in competition. *Journal of Research in Personality*, *14*(1), 70-75.

Cormier, D. L., Dunn, J. G., Dunn, J. C., & Rumbold, J. L. (2019). Grit and perfectionism in intercollegiate athletes. *Journal of Exercise, Movement, and Sport (SCAPPS refereed abstracts repository)*, *51*(1), 89-89.

Corstorphine, E., Mountford, V., Tomlinson, S., Waller, G., & Meyer, C. (2007). Distress tolerance in the eating disorders. *Eating behaviors*, *8*(1), 91-97.

Cougle, J. R., Bernstein, A., Zvolensky, M. J., Vujanovic, A. A., & Macatee, R. J. (2013). Validation of self-report measures of emotional and physical distress tolerance. *Journal of Psychopathology and Behavioral Assessment*, *35*(1), 76-84.

Curtiss, G., & Tuttle, K. (1993). *Wisconsin Card Sorting Test: Computer version-2*. Lutz, FL: Psychological Assessment Resources.

Dahling, J. J., Whitaker, B. G., & Levy, P. E. (2009). The development and validation of a new Machiavellianism scale. *Journal of Management*, *35*, 219–257.

Dang, J., King, K. M., & Inzlicht, M. (2020). Why are self-report and behavioral measures weakly correlated?. *Trends in cognitive sciences*, *24*(4), 267-269.

Darzi, Z., Tajeri, B., & Meschi, F. (2022). The role of perceived stress & Distress Tolerance in psychological Wellbeing in married Students. *Razi Journal of Medical Sciences*, *29*(1).

Daughters, S. B., Lejuez, C. W., Kahler, C. W., Strong, D. R., & Brown, R. A. (2005). Psychological distress tolerance and duration of most recent abstinence attempt among residential treatment-seeking substance abusers. *Psychology of Addictive Behaviors*, *19*(2), 208.

De Clercq, D., Fatima, T., & Jahanzeb, S. (2022). The link between interpersonal conflict and knowledge hiding: Mediated by relatedness need frustration, moderated by narcissistic rivalry. *International Journal of Conflict Management, 33*(3), 494-518.

Dill, J. C., & Anderson, C. A. (1995). Effects of frustration justification on hostile aggression. *Aggressive Behavior, 21*(5), 359-369.

D'Mello, S., & Graesser, A. (2012). Dynamics of affective states during complex learning. *Learning and Instruction*, *22*(2), 145-157.

Duckworth, A. L., Kirby, T. A., Tsukayama, E., Berstein, H., & Ericsson, K. A. (2011). Deliberate practice spells success: Why grittier competitors triumph at the National Spelling Bee. *Social Psychological and Personality Science, 2*(2), 174-181.

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.

Dunn, J. G., Kono, S., Cormier, D. L., Causgrove Dunn, J., & Rumbold, J. (2021). Perfectionism and grit in competitive sport. *Journal of Sport Behavior*, *44*(3).

Eaton, J., & Tieber, C. (2017). The effects of coloring on anxiety, mood, and perseverance. *Art Therapy*, *34*(1), 42-46.

Ellis, A. (1979). Discomfort anxiety: A new cognitive behavioral construct. Part I. *Rational Living, 14*, 3–8.

Ellis, A. (1980). Discomfort anxiety: A new cognitive behavioral construct. Part II. *Rational Living, 15*, 25–30.

Entertainment Software Association (2022, July). *2022 Essential facts about the video game industry*. https://www.theesa.com/resource/2022-essential-facts-about-the-video-game-industry/

Farris, S. G., Leyro, T. M., Allan, N. P., Øverup, C. S., Schmidt, N. B., & Zvolensky, M. J. (2016). Distress intolerance during smoking cessation treatment. *Behaviour Research and Therapy*, *85*, 33-42.

Filippello, P., Harrington, N., Costa, S., Buzzai, C., & Sorrenti, L. (2018). Perceived parental psychological control and school learned helplessness: The role of frustration intolerance as a mediator factor. *School Psychology International*, *39*(4), 360-377.

Foddy, B. (2017). *Getting over it with Bennett Foddy* [Steam]. Noodlecake Studios

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*(5), 449-468.

Gotwals, J. K., Stoeber, J., Dunn, J. G., & Stoll, O. (2012). Are perfectionistic strivings in sport adaptive? A systematic review of confirmatory, contradictory, and mixed evidence. *Canadian Psychology/Psychologie Canadienne, 53*(4), 263.

Gross, J. J., & Levenson, R. W. (1995). Emotion elicitation using films. *Cognition and Emotion, 9*, 87–108.

Gross, J. J., & Muñoz, R. F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science and Practice*, *2*(2), 151-164.

Harrington, N. (2005a). The frustration discomfort scale: Development and psychometric properties. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice*, *12*(5), 374-387.

Harrington, N. (2005b). It's too difficult! Frustration intolerance beliefs and procrastination. *Personality and Individual Differences, 39*, 873– 883.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*(4), 408-420.

Hewitt P.L., & Flett G.L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology, 60*, 456–470.

Hewitt, P. L., Flett, G. L., Turnbull-Donovan, W., & Mikail, S. F. (1991). The Multidimensional Perfectionism Scale: Reliability, validity, and psychometric properties in psychiatric samples. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, *3*(3), 464.

Hill, A. P., Mallinson-Howard, S. H., & Jowett, G. E. (2018). Multidimensional perfectionism in sport: A meta-analytic review. *Sport, Exercise, and Performance Psychology, 7*(3), 235-270.

Houston, J. M., Luchner, A., Davidson, A. J., Gonzalez, J., Steigerwald, N., & Leftwich, C. (2020). The Bright and Dark Aspects of Grit in the Pursuit of Success. *Psychological Reports*, *124*(2), 839-861.

Isenberg, G., Brown, A., DeSantis, J., Veloski, J., & Hojat, M. (2020). The relationship between grit and selected personality measures in medical students. *International journal of medical education*, *11*, 25.

Jeong, E., & Jung, M. R. (2018). Effects of positive psychological capital, academic stress and academic achievement in nursing student on grit. *Journal of Digital Convergence*, *16*(9), 309-317.

Jonason, P. K., & Tost, J. (2010). I just cannot control myself: The Dark Triad and self-control. *Personality and Individual differences*, *49*(6), 611-615.

Jowett, G. E., Hill, A. P., Hall, H. K., & Curran, T. (2016). Perfectionism, burnout and engagement in youth sport: The mediating role of basic psychological needs. *Psychology of Sport and Exercise, 24*, 18-26.

Kalia, V., Fuesting, M., & Cody, M. (2019). Perseverance in solving Sudoku: Role of grit and cognitive flexibility in problem solving. *Journal of Cognitive Psychology*, *31*(3), 370-378.

Kannangara, C. S., Allen, R. E., Waugh, G., Nahar, N., Khan, S. Z. N., Rogerson, S., & Carson, J. (2018). All that glitters is not grit: Three studies of grit in university students. *Frontiers in psychology*, *9*, 1539.

Karabenick, S. A. (2003). Seeking help in large college classes: A person-centered approach. *Contemporary Educational Psychology*, *28*(1), 37-58.

Knauft, K. M. (2019). *Buffering Effects of Grit and Cognitive Reappraisal in the Context of Perceived Stress* (Doctoral dissertation, Miami University).

Keough, M. E., Riccardi, C. J., Timpano, K. R., Mitchell, M. A., & Schmidt, N. B. (2010). Anxiety symptomatology: The association with distress tolerance and anxiety sensitivity. *Behavior Therapy*, *41*(4), 567-574.

Lazarus R. S., Alfert E. (1964). Short-circuiting of threat by experimentally altering cognitive appraisal. *Journal of Abnormal Psychology*, 69, 195–205.

Lejuez, C. W., Kahler, C. W., & Brown, R. A. (2003). A modified computer version of the Paced Auditory Serial Addition Task (PASAT) as a laboratory-based stressor. *The Behavior Therapist*, *26*(4), 290–293.

Leyro, T. M., Zvolensky, M. J., & Bernstein, A. (2010). Distress tolerance and psychopathological symptoms and disorders: A review of the empirical literature among adults. *Psychological Bulletin, 136*, 576 – 600.

Linehan, M. M. (1993). Dialectical behavior therapy for treatment of borderline personality disorder: implications for the treatment of substance abuse. *NIDA Research Monograph, 137*, 201-201.

Liu, C., He, J., Ding, C., Fan, X., Hwang, G. J., & Zhang, Y. (2021). Self-oriented learning perfectionism and English learning burnout among EFL learners using mobile applications: The mediating roles of English learning anxiety and grit. *Learning and Individual Differences*, *88*, 102011.

Lorenz, T., Beer, C., Pütz, J., & Heinitz, K. (2016). Measuring psychological capital: Construction and validation of the compound PsyCap scale (CPC-12). *PloS One*, *11*(4).

Lucas, G. M., Gratch, J., Cheng, L., & Marsella, S. (2015). When the going gets tough: Grit predicts costly perseverance. *Journal of Research in Personality, 59*, 15-22.

Luthans, K. W., Luthans, B. C., & Chaffin, T. D. (2019). Refining grit in academic performance: The mediational role of psychological capital. *Journal of Management Education, 43*(1), 35-61.

Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). Psychological capital: Investing and developing positive organizational behavior. *Positive Organizational Behavior*, *1*(2), 9-24.

Malesza, M. (2020). The effects of the Dark Triad traits in prisoner's dilemma game. *Current Psychology*, *39*(3), 1055-1062.

Marcus-Newhall, A., Pedersen, W. C., Carlson, M., & Miller, N. (2000). Displaced aggression is alive and well: a meta-analytic review. *Journal of Personality and Social Psychology*, *78*(4), 670.

Matheny, N. L., Smith, H. L., Summers, B. J., McDermott, K. A., Macatee, R. J., & Cougle, J. R. (2017). The role of distress tolerance in multiple facets of hostility and willingness to forgive. *Cognitive Therapy and Research*, *41*(2), 170-177.

McHugh, R. K., & Otto, M. W. (2011). Domain-general and domain-specific strategies for the assessment of distress intolerance. *Psychology of Addictive Behaviors*, *25*(4), 745.

McHugh, R. K., Reynolds, E. K., Leyro, T. M., & Otto, M. W. (2013). An examination of the association of distress intolerance and emotion regulation with avoidance. *Cognitive Therapy and Research, 37*(2), 363–367.

Meindl, P., Yu, A., Galla, B. M., Quirk, A., Haeck, C., Goyer, J. P., Lejuez, C. W., D'Mello, S. K., & Duckworth, A. L. (2019). A brief behavioral measure of frustration tolerance predicts academic achievement immediately and two years later. *Emotion*, *19*(6), 1081.

Melchers, M., Montag, C., Markett, S., & Reuter, M. (2015). Assessment of empathy via self-report and behavioural paradigms: data on convergent and discriminant validity. *Cognitive Neuropsychiatry*, *20*(2), 157-171.

Merchant, J. A., & Lundell, J. A. (2001). Workplace violence: A report to the nation. Iowa City: University of Iowa.

Miller, G. E., Chen, E., & Zhou, E. S. (2007). If it goes up, must it come down? Chronic stress and the hypothalamic–pituitary–adrenocortical axis in humans. *Psychological Bulletin*, *133*(1), 25.

Mirkovic, D., & Bianchi, R. (2019). An exploratory study of the link between Machiavellianism and burnout. *Personality and Individual Differences, 148,* 27-31.

Murphy, B. A., & Lilienfeld, S. O. (2019). Are self-report cognitive empathy ratings valid proxies for cognitive empathy ability? Negligible meta-analytic relations with behavioral task performance. *Psychological Assessment, 31*(8), 1062.

Park, N. K., Chun, M. Y., & Lee, J. (2016). Revisiting individual creativity assessment: Triangulation in subjective and objective assessment methods. *Creativity Research Journal, 28*(1), 1-10.

Rai, S. N., & Gupta, M. D. (1988). Frustration tolerance in Machiavellians. *Indian Journal of Current Psychological Research, 3*(2), 115–119.

Pine, R., Fleming, T., McCallum, S., & Sutcliffe, K. (2020). The effects of casual videogames on anxiety, depression, stress, and low mood: a systematic review. *Games for health journal, 9*(4), 255-264.

Rogoza, R., Kowalski, C. M., Saklofske, D. H., & Schermer, J. A. (2022). Systematizing dark personality traits within broader models of personality. *Personality and Individual Differences, 186,* 111343.

Rogoza, R., Kowalski, C. M., & Schermer, J. A. (2019). Dark triad traits within the framework of the circumplex of personality metatraits model. *Journal of Individual Differences, 40*(3), 168–176.

Rouder, J. N., & Haaf, J. M. (2019). A psychometrics of individual differences in experimental tasks. *Psychonomic Bulletin & Review, 26*(2), 452-467.

Ryckman, R. M., Thornton, B., & Butler, J. C. (1994). Personality correlates of the hypercompetitive attitude scale: Validity tests of Horney's theory of neurosis. *Journal of Personality Assessment*, *62*(1), 84-94.

Shafer, Daniel M. (2014). Investigating suspense as a predictor of enjoyment in sports video games. *Journal of Broadcasting & Electronic Media*, *58*(2), 272-288.

Shafique, A., Hayat, Q., & Khan, M. K. (2022). Impact of grit on workplace happiness: A moderated mediation model. *Journal of Management Info, 9*(3), 418-434.

Singh, K., & Jha, S. D. (2008). Positive and negative affect, and grit as predictors of happiness and life satisfaction. *Journal of the Indian Academy of Applied Psychology*, *34*(2), 40-45.

Simons, J. S., & Gaher, R. M. (2005). The Distress Tolerance Scale: Development and validation of a self-report measure. *Motivation and Emotion*, *29*(2), 83-102.

Spector, P. E., Fox, S., & Domagalski, T. (2006). Emotions, violence and counterproductive work behavior. *Handbook of Workplace Violence*, 29-46.

Strayhorn, T. L. (2013). What role does grit play in academic success of black male collegians at predominately white institutions? *Journal of African American Studies, 18*(1), 1-10

Strong, D. R., Lejuez, C. W., Daughters, S., Marinello, M., Kahler, C. W., &Brown, R. A. (2003). *The computerized mirror tracing task* (Version 1). Butler Hospital, Providence, RI. Unpublished manual.

Uomoto, J. M. (1986). Examination of psychological distress in ethnic minorities from a learned helplessness framework. *Professional Psychology: Research and Practice, 17*(5), 448.

Vaart, L., Zyl, L.E., & Wingerden, J. (2021). Developing Gritty Job Seekers: A Need-Supportive Approach to Grit Interventions. In: van Zyl, L.E., Olckers, C., Vaart, L. (Eds.) *Multidisciplinary Perspectives on Grit* (pp. 239-260). Springer, Cham.

Vrijkotte, T. G., Van Doornen, L. J., & De Geus, E. J. (2000). Effects of work stress on ambulatory blood pressure, heart rate, and heart rate variability. *Hypertension*, *35*(4), 880-886.

Wilde, J. (2012). The relationship between frustration intolerance and academic achievement in college. *International Journal of Higher Education, 1*, 1– 8.

Williams, C. L., Vik, P. W., & Wong, M. M. (2015). Distress tolerance in social versus solitary college student drinkers. *Addictive Behaviors*, *50*, 89-95.

Wilson, T. B., Caporale-Berkowitz, N. A., Parent, M. C., & Brownson, C. B. (2021). Grit is associated with decreased mental health help-seeking among student veterans. *Journal of American College Health*, 1-6.

Wilson, D. S., Near, D., & Miller, R. R. (1996). Machiavellianism: a synthesis of the evolutionary and psychological literatures. *Psychological Bulletin*, *119*(2), 285.

Zeifman, R. J., Boritz, T., Barnhart, R., Labrish, C., & McMain, S. F. (2020). The independent roles of mindfulness and distress tolerance in treatment outcomes in dialectical behavior therapy skills training. *Personality Disorders: Theory, Research, and Treatment*, *11*(3), 181.

Zvolensky, M. J., Vujanovic, A. A., Bernstein, A., & Leyro, T. (2010). Distress tolerance: Theory, measurement, and relations to psychopathology. *Current Directions in Psychological Science*, *19*(6), 406-410.