

WEATHERING THE STORM: MODERATORS OF PSYCHOLOGICAL DISTRESS AND
ACADEMIC SUCCESS AFTER HURRICANE HARVEY

A Thesis

by

ROBERT CURTIS MARTIN

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Chair of Committee,	Mindy E. Bergman
Committee Members,	Isaac E. Sabat
	Leroy G. Dorsey
Head of Department,	Heather C. Lench

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ABSTRACT

Natural disasters are devastating for everyone impacted. They are also increasing in frequency and severity. However, research on the impact of natural disasters and education is limited, especially with a focus on their impact on college students. The beginning of the academic year is critical to adjustment for college students; it is also when Hurricane Harvey battered Houston, Texas and the surrounding areas. It is well-established that psychological distress negatively affects academic success. I will present personality factors and socioeconomic status as potential moderators of the relationship between psychological distress and academic success in the context of a natural disaster. I will apply conservation of resources theory and the transactional stress model to examine the influence of these potential moderators. I hypothesize that openness to experience, conscientiousness, extraversion, agreeableness, emotional stability, and socioeconomic status will be resources that decrease the negative impact of psychological distress on grades. The sample includes college students from a large southwestern university. The hypotheses will be tested using linear regression, mediation, and moderation analyses. Hypothesis 2, which predicted that the impact of natural disasters on students would be positively related to psychological distress, was supported. However, all hypotheses regarding the moderating effects of personality traits and socioeconomic status on the relationship between the negative effect of distress from natural disasters on academic success were not supported. These findings suggest that while natural disasters are stressful, they may not impact academic success.

CONTRIBUTORS AND FUNDING SOURCES

Contributors

This work was supervised by a thesis committee consisting of Professor Mindy E. Bergman [advisor] of the Department of Psychological and Brain Sciences, Assistant Professor Isaac E. Sabat of the Department of Psychological and Brain Sciences, and Professor Leroy G. Dorsey of the Department of Communication.

All other work conducted for the thesis was completed by the student, under the advisement of Dr. Mindy E. Bergman.

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INTRODUCTION

Natural disasters are very dangerous and harmful to people, ultimately resulting in possible loss of life, health, personal possessions, employment, and housing for those impacted. Natural disasters are impacting more people due to the rising density of people living in areas more likely to experience them (Van der Vink et al., 1998). Furthermore, researchers predict that there will be an increase in the number of natural disasters (Van Aalst, 2006). As such, research on natural disasters is becoming increasingly important.

Hurricane Harvey struck on August 25, 2017, around the beginning of the semester for many college campuses in the United States (Chavez & Levenson, 2017; Wang, Zhao, Yoon, Klotzbach, & Gillies, 2018). The effects of the storm were devastating, displacing more than one million people and causing estimated damages between \$150 billion and \$180 billion dollars across Texas (“Hurricane Harvey”, 2017a). The Greater Houston Area, which includes nine counties and over 26,000 kilometers of land, was flooded by a record 76 centimeters of rain (Chakraborty, Collins, & Grineski, 2019). Furthermore, this specific area is very populous with almost 6.5 million people recorded in 2016 and one of the most racially and ethnically diverse metropolitan statistical areas within the United States (Chakraborty et al., 2019).

The beginning of the semester can be a very challenging period for students. The beginning of the first-year semester, especially the first weeks, is essential to successful adapting and achievement for college students (Bowman, Jarrat, Jang, & Bono, 2019). For example, students have to contend with living away from home, developing new social and support networks, balancing budgets, and physically finding their way around a new environment all on their own (Sanagavarapu, Abraham, & Taylor, 2019). These typical adjustment needs of first

year students, combined with the problems that occurred due to Hurricane Harvey, may have taxed the well-being of students entering college in Fall 2017, inhibiting their success.

While there is a large quantity of research on natural disasters, very little has been done in the education field, and even then, most is on children and adolescents rather than university students (Di Pietro, 2018; Doyle, Lockwood, & Comiskey, 2017). The work is vital as reactions to natural disasters can be distressing. Children's reactions to disasters include depression, anxiety, psychological distress, and symptoms of post-traumatic stress disorder; children have also exhibited decreases in school performance (DeVaney, Carr, & Allen, 2009). These symptoms are similar to those of other victims of natural disasters who also report these symptoms as well as attentional issues and sleep problems (Pickens, Field, Prodromidis, & Palaez-Nogueras, 1995). Given the multitude of negative symptoms associated with natural disasters, one may expect negative outcomes for college students.

The purpose of this thesis is to examine the impact of individual level factors on the relationship between distress from natural disasters and academic success. To that end, I will (1) use theories of stress to explain why a natural disaster may have influenced the academic success of college students and (2) report the results of a survey with college students who were directly affected by a disaster while attending college at Texas A&M University, which is near to the Houston metropolitan area. The natural disaster specific to the population in the study is Hurricane Harvey. First, I will review several relevant theories of stress including the Conservation of Resources Model and Transactional Stress Model. Then, I will review psychological distress, personality, and socioeconomic status as potential factors impacting stress.

Stress and Natural Disasters

Given that natural disasters are unpredictable and can cause massive amounts of damage and harm, it is unsurprising that they are very stressful events for victims within their paths. Natural disasters vary in potential for harm of impacted communities because they differ in intensity (Norris, Perilla, Riad, Kaniasty & Lavizzo, 1999). Further, natural disasters can impact many different aspects of life including property, housing, employment, and education among other factors (Ward, Shelly, Kaase, & Pane, 2008). Increases in intensity can lead to loss of resources such as food, shelter, and water. As such, the impact of Hurricane Harvey should result in increased psychological distress due to loss of resources across multiple aspects of life. In the following, I will describe two theories of stress as explanations within the context of students coping with the effects of natural disasters.

Conservation of resources model. The study uses the conservation of resources (COR) model as an overall explanation of the negative effect of natural disasters on students (Hobfoll, 1989). COR's main principle is that "people strive to retain, protect, and build resources and that what is threatening to them is the potential loss of these valued resources" (Hobfoll, 1989, p. 516). The model defines stress as a response to a situation that includes the possibility of losing resources, the actual loss of resources, or the absence of resources after investing personal resources (Hobfoll, 1989). Resources are defined as "objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions or energies" (Hobfoll, 1989, p. 516). The conservation of resources model has been used by other researchers of natural disasters (Freedy, Saladin, Kilpatrick, Resnick, & Saunders, 1994; Hochwarter, Laird, & Brouer, 2008; Wadsworth, Santiago & Einhorn, 2009) and Hobfoll (1989) even suggests environmental

conditions frequently jeopardize or actually diminish resources. Applying COR to natural disasters suggests that stress occurs due to a reduction in resources caused by natural disasters and will lead to negative consequences as a result. Next, the transactional stress model will be discussed as a supplemental explanation to COR.

Transactional stress model. The transactional model of stress (Lazarus & Folkman, 1984) is concerned with events where individuals feel that their resources are burdened or exceeded. According to the transactional stress model, stress occurs when a person is in contact with stimuli that are damaging or threatening to the ability to cope (Lazarus & Folkman, 1987). Cognitive appraisal occurs when an individual evaluates a situation in regard to its influence on well-being and considers resources for coping and mitigating harm (Lazarus & Folkman, 1984). Primary appraisal is the determination of the significance of a situation to the person and can be classified as irrelevant, benign-positive, or stressful (Lazarus & Folkman, 1984). A stressful appraisal occurs when events are evaluated as “threatening, challenging, or harmful” and leads to attempts at coping to address the stressor (Lazarus & Folkman, 1984, p. 352). Irrelevant appraisal occurs when a person’s well-being is not impacted by the situation, whereas benign-positive appraisals arise when a situation maintains or improves well-being (Lazarus & Folkman, 1984). Secondary appraisal is an evaluation of coping options or resources that are available to deal with a situation. Thus, the cognitive appraisal process is critical to levels of distress. The following section will discuss natural disasters and college students.

Hurricane Harvey and Academic Success

Previous research on a lower secondary population demonstrated that the impact of a natural disaster (severe flooding) was negatively related to student achievement (Thamtanajit, 2020). Another study found that graduation rates of university students decreased following an

earthquake (Di Pietro, 2018). These results are consistent with the conservation of resources theory. I anticipate replicating the effect here:

Hypothesis 1: The impact of natural disasters is negatively related to academic success.

However, as per the transactional stress model, I anticipate that the detrimental effects of Hurricane Harvey on academic success will be mediated by psychological distress. Stated more clearly, I will propose in the following sections that the loss of resources caused by Hurricane Harvey will increase distress and the increased distress should result in decreased academic success as discussed in the previous section.

Psychological Distress

Psychological distress is a negative psychological condition that includes symptoms such as anxiety, depression, social dysfunction, and loss of confidence (Schonfeld & Chang, 2017; Veit & Ware, 1983). As noted previously, adjusting to university living, especially as a first-year student, in and of itself can be difficult. The typical college years are during the same time period as the onset of many mental health issues (Kessler et al., 2007). Also, mental health problems are on the rise for college students and those that report financial problems and concerns are more at risk for mental health issues (Eisenberg, Gollust, Golberstein, & Hefner, 2007). Given the age of onset and increase in risk of mental health issues for college students, additional distress due to natural disasters can be more devastating for students beginning the academic year. When students feel as if experiences in school are negative, motivation and performance may decrease (Struthers, Perry, & Menec, 2000). Furthermore, attention to psychological distress of the college student population following disasters is vital for ensuring the wellness of students as evidenced by a study that found people impacted by hurricanes have increased posttraumatic stress as well as depression and anxiety (Davis, Grills-Taquechel, & Ollendick, 2010).

Psychological distress has been shown to be elevated for the college student population in comparison to adults in the general population (Adlaf, Gliksman, Demers, & Newton-Taylor, 2001; Cockran & Hale, 1985; Stallman, 2010). First-year college students who are dealing with posttraumatic stress disorder symptoms have greater difficulty in regulation of efforts than students who do not have PTSD, which in turn leads to lower GPA and decreases in second year retention (Boyraz, Granda, Baker, Tidwell, & Waits, 2016). Psychological distress negatively impacts academic performance and completion of courses for both undergraduate and graduate students (Eisenberg et al., 2007). Over 40% of undergraduates have named mental and emotional issues as causes for problems with academic performance (Sharp & Theiler, 2018). In a study of community college students affected by Hurricane Katrina, psychological distress was identified as a negative predictor of college re-enrollment following the disaster (Lowe & Rhodes, 2013).

In addition to negatively impacting academic performance, distress has been shown to also be associated with negative health behaviors for individuals including increased cigarette smoking as well as binge drinking (Sharp & Theiler, 2018). Binge drinking can also be detrimental to completion of coursework as well as class attendance. Stress has been associated with headache, tiredness, and sleep difficulties for individuals in the mid-to-late teens; these problems can lead to attention issues for students (Shankar & Park, 2016).

Timing of stressful events can also be problematic. Longitudinal research has shown that the transition into college is a factor in increasing psychological distress such that all students regardless of pre-college distress levels saw increases in psychological distress (Sharp & Theiler, 2018). So, the timing of natural disasters may be especially traumatic considering the accumulation of stress from both the starting of a new academic year as well as the damage and aftermath from the natural disaster. As such, COR and the transactional model of stress both

suggest that these traumatic situations are threatening, reduce and limit resources, and prompt thoughts of resolution to the problems that arise, and that when a natural disaster like Harvey happens at the start of the academic year and academic career of a student, it could be especially distressing. Based on this review, I hypothesize:

Hypothesis 2: The impact of natural disasters on students is positively related to psychological distress.

Hypothesis 3: Psychological distress from natural disasters is negatively related to academic success among students.

Personality as a Resource

Hobfoll (1989) suggested that personal characteristics are resources when they assist in reducing stress. Personality, in particular, has been proposed as a resource to assist people in meeting needs and decreasing psychological strain while working (Penney, Hunter & Perry, 2011). This finding suggests that personality characteristics will moderate the relationship between distress and grades in the context of a natural disaster. In this case, moderation is the appropriate model because when distress is occurring, the amount of the personality characteristic a person has is the resource, so it can weaken the effect of distress on grades. Given this general proposition, I will investigate the role of various facets of personality as resources, specifically the Big Five traits including openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism or emotional stability. See Figure 1 in Appendix A for a general illustration of the proposed interaction effects.

Openness to experience. Openness to experience is engagement with expressive and sensory experiences and has been found to be positively associated with post-secondary academic performance as well as intelligence (Barrick & Mount, 1991; O'Connor & Paunonen,

2007; Carter, Miller, & Widiger, 2018). Additionally, openness has been described as fascination with unfamiliar circumstances as well as new beliefs and unexpected encounters (Karnaci et al., 2012). People higher in openness to experience have greater stress resilience while those lower in openness have higher susceptibility to negative stress (Williams, Rau, Cribbet, & Gunn, 2009). Thus, I propose that openness to experience will be a resource to students because having the ability to be open to new experiences may assist in adapting to circumstances following the natural disasters. Specifically, looking at the disaster as a new experience allows for reframing events as an adaptation to stress. In the context of this study, a student high in openness to experience will look at the circumstances caused by natural disasters as a unique experience and be better able to withstand the unfamiliar circumstances, thereby tempering the effects of distress. Given that openness reflects a variety of adaptation and coping mechanisms, I propose:

Hypothesis 4: Openness to experience moderates the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress, especially among those lower in openness to experience.

Conscientiousness. Conscientiousness includes adaptive benefits such as being careful, organized, and disciplined and striving for achievement; it is correlated with performance and academic success and low levels of negative affect (Barrick & Mount, 1991; Carter et al., 2018; O'Connor & Paunonen, 2007). I propose that individuals higher in conscientiousness will have an easier time adapting to circumstances that occur due to natural disasters than those who score lower. Specifically, being reliable and disciplined are resources that will help students regain and maintain control of aspects of life that are affected by natural disasters. Further, conscientious

students also strive for achievement, meaning that they will continue to push towards goals of high performance in the classroom. Conscientiousness is also associated with problem-focused coping and suggests that students would create specific strategies to cope with stress due to a natural disaster (Bakker, Van Der Zee, Lewig, & Dollard, 2006; Watson & Hubbard, 1996). This discipline and ability to problem solve will ultimately reduce the impact of stress caused by natural disasters. Given the positive benefits of conscientiousness, I propose:

Hypothesis 5: Conscientiousness moderates the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress, especially among those lower in conscientiousness.

Extraversion. Extraversion is being sociable, talkative, or risk-taking and has been shown to have little effect on academic performance (Barrick & Mount, 1991, O'Connor & Paunonen, 2007). Despite this, extraversion may be an important predictor of academic success during natural disasters. Extraverts have larger support systems and seek assistance earlier than introverts (Amirkhan, Risinger, & Swickert, 1995). Individuals higher in extraversion have also been shown to be more optimistic than introverts (Costa & McCrae, 2008). These facets of extraversion all suggest that extraversion is a resource that can protect people affected by natural disasters. Having an optimistic attitude can benefit those in a negative situation such as that of a natural disaster by using focus on positive factors to endure difficult times. Extraverts will also have a larger support network and seek help more quickly, so that extraversion is a proxy for access to support and resources. For example, a student higher in extraversion may speak with more individuals about struggles due to natural disaster and ultimately receive more assistance

than a student who interacts less with others. Therefore, individuals who are more extraverted will have more access to support systems and resources that will reduce the effects of stress:

Hypothesis 6: Extraversion moderates the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress, especially among those lower in extraversion.

Emotional Stability. Emotional stability is linked with traits such as anxiety, worry, anger, and embarrassment and is correlated with post-secondary academic performance indicators such as GPA and thesis research performance (Barrick & Mount, 1991; O'Connor & Paunonen, 2007). Further, emotional stability is associated with beliefs of limited or decreased resources, pessimistic evaluation of one's circumstances, and increased beliefs of risk (Vollrath, 2001). Thus, in the context of student success following a natural disaster like Hurricane Harvey, lower emotional stability can take a toll on students by impacting perceptions of already uncertain circumstances that occur due to natural disasters. Additionally, the effects of natural disasters may exacerbate anxiety and worry in people who are low in emotional stability such that the effects of distress are amplified and grades decrease. Therefore, I posit that:

Hypothesis 7: Emotional stability moderates the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress, especially among those lower in emotional stability.

Agreeableness. Agreeableness reflects being courteous, cooperative, and tolerant. Across the relatively limited amount of research linking agreeableness to post-secondary academic

performance, the results have been mixed (Barrick & Mount, 1991; O'Connor & Paunonen, 2007). In theory, agreeableness will be a resource to students because they are tolerant and cooperative and will continue in doing what is necessary in class regardless of circumstances. Agreeableness is negatively associated with absences from classes (Farsides & Woodfield, 2003). Further, agreeableness is positively related to obtaining social support (Bowling, Beehr, & Swader, 2005; Branje, van Lieshout, van Aken, 2004). As such, social support and having a cooperative nature will be beneficial to students and allow for improved performance in the classroom. As an example, a student higher in agreeableness is more likely to receive needed resources and assistance with problems than a student who is lower in agreeableness. Therefore, in the cases of students experiencing stress, agreeableness buffers the relationship between stress and academic performance. As such, I propose:

Hypothesis 8: Agreeableness moderates the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress, especially among those lower in agreeableness.

Socioeconomic Status

As previously noted, COR (Hobfoll, 1989) posits that resources include object resources, conditions, personal characteristics, energy, and social support that all aid in decreasing stress. Socioeconomic status (SES) is a hierarchically organized factor demonstrating benefit from or influence over wealth, power, and control (Mueller & Parcel, 1981). Therefore, SES should be considered as a resource (Hobfoll, 1989) for use by individuals under stress as power, control, and wealth can be used to satisfy needs or demands. Here again, moderation is a fitting model for explaining how SES fits into the relationship between distress and grades because SES can

influence the effect of distress on grades. Specifically, power or wealth can be used to change circumstances during an event, and as that power or wealth increases so does the ability to change circumstances. For example, students with greater wealth can more easily adapt to a dwelling destroyed by a hurricane by paying for repairs or even relocating than could students with less wealth. As such, I will investigate SES as a resource to combat the impact of distress on academic success.

Research has consistently demonstrated that undesirable events have more negative effects as SES level is reduced (McLeod & Kessler, 1990). Also, low SES students are more likely to come from households where information regarding the higher education system is more limited, again reducing resources available to students to aid in college success. Research suggests that individuals who have worries over financial issues have reduced attention and cognition (Shah, Mullainathan, & Shafir, 2012), which according to cognitive load theory would make day-to-day college activities such as learning, note-taking, and studying more difficult (Sweller, 1989). These all indicate that:

Hypothesis 9: Student socioeconomic status moderates the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress, especially among those lower in student socioeconomic status.

Covariates of Academic Success

The study includes first generation status, gender, and race as covariates. These three variables are related to academic success. First generation status was selected as a control variable due to its likelihood to impact academic success; more specifically, this status is

associated with decreased academic success (Dennis, Phinney, & Chuateco, 2005; Petty, 2014). Research has shown that first generation students may be a disadvantage in readiness for college due to inadequate preparation from the education system (Dennis et al., 2005; Lightweis, 2014; Petty, 2014;). Further, additional barriers for these students include being the first in their family to attend college, lack of information on higher education, lack of social support, and financial constraints (Lightweis, 2014).

A second covariate of the study is gender, which is also related to academic success of college students in complex ways. Overall, women have not only closed the gender gap that began in the 1930s for college enrollment and graduation, but reversed it (Goldin, Katz, & Ilyana, 2006). Additionally, studies show that women have higher GPA during high school than men (Conger & Long, 2010). However, this overall trend of greater success for women in college is not consistent across fields of study. For example, women are less likely to enroll in STEM fields (Redmond-Sanogo, Angle, & Davis, 2016). Moreover, other research on the topic suggests that there may be no relationship between gender and academic success (Laskey & Hetzel, 2011). Thus, although there is mixed evidence regarding the relationship between gender and college success, it seemed prudent to account for it in the models tested here.

The final covariate included in the current study is race. Researchers have noted that race is correlated with academic performance. Minority students have lower performance in college compared to their White peers (Fischer, 2007; Fletcher & Tienda, 2010). Similar to first generation students, minorities also face the issue of inadequate secondary education systems and financial support leaving them less prepared for college (Fischer, 2007; Fletcher & Tienda, 2010).

METHOD

Participants and Procedure

Online survey data were gathered from 355 undergraduate students enrolled in introductory psychology who opted to participate in this study, as one of their many options, to meet a class requirement for research participation. Students were enrolled at Texas A&M University, which is near the Houston metropolitan area and which experienced considerable rainfall during Hurricane Harvey. In fact, in the Fall 2017, when Harvey occurred, the university delayed the start of classes for students for two days because of the extreme weather. Further, the university and community also made some resources available to students (e.g., Harvey Disaster Relief Fund) to assist with returning to normalcy following the hurricane as some students and their families were affected. Data were collected for this study during the following semester (i.e., Spring 2018). The participants read an information sheet about the purpose of the study and consented to participation. All participants then completed the Qualtrics survey and were debriefed. The study took approximately 15 minutes to complete. A power analysis was conducted using Gpower and determined that a sample size of 210 participants would be needed to reach a power of 0.80 assuming a medium effect size (Faul, Erdfelder, Lang, & Buchner, 2007). Thus, the sample here more than meets this standard.

To maintain reliable data, one participant who identified as a gender other than male or female was removed from the starting sample of 355. As such, 354 participants data was analyzed for the present study. The study consisted of 354 participants who identified as White (69.3%), Multi-racial (14.4%), Asian (7.9%), Black (6.2%), Other (1.4%), or American Indian/Alaska Native (.8%). The participants ranged in ages from 18-29 with a mean age of 19.6 years ($SD = 1.3$). Finally, participants identified as male (23.2%) or female (76.8%).

Measures

The complete measures for each of the following appear in Appendix B.

Demographics. Participants completed a series of items concerning demographic information including age, gender, race, and sexual orientation.

Personality. Personality was measured using the Big Five Inventory 10 (BFI-10; Rammstedt & John, 2007), which is a 10-item measure containing two questions for each factor of the five-factor model of personality. Responses were completed on a five-point Likert-type scale that had anchors from 1 = disagree strongly to 5 = agree strongly. “I see myself as someone who is reserved” (extraversion) and “I see myself as someone who gets nervous easily” (emotional stability) are example items. The Cronbach’s alpha is listed for each personality trait as follows: extraversion, $\alpha = .70$; agreeableness, $\alpha = .31$; conscientiousness, $\alpha = .36$; emotional stability, $\alpha = .59$; openness, $\alpha = .33$.

Psychological Distress. To assess psychological distress, the Brief Symptom Inventory ($\alpha = .94$; BSI; adapted from Derogatis & Spencer, 1982) was adapted. The BSI is a 13-item six-point Likert-type scale that includes anchors from 0 = Never to 5 = Once a week or more. The scale was adapted to include the prompt “Since Harvey, have you had any of the following symptoms?” and includes a list of symptoms such as “feeling easily annoyed or irritated,” “feeling blue,” and “having urges to smash or break things.”

Impact of Hurricane Harvey. To assess the impact of Hurricane Harvey, the Loss Impact Index ($\alpha = .70$) was created. The 9-item index included questions regarding aspects of life impacted by Hurricane Harvey including: finances, housing, and physical health. The inventory had the prompt “Did any of the following happen to you because of Hurricane Harvey?” and

included a list of experiences such as “lose housing” and “have financial burdens or money problems.”

Socioeconomic status. A 6-item adapted version of the Family Affluence Scale III ($\alpha = .31$; FAS-3; adapted from Hartley, Leven & Currie, 2016) was used to measure socioeconomic status. While this low reliability may seem concerning, the measure is formative, where indicators influence the construct as opposed to a reflective measurement (like many psychological measures, such as personality traits) in which the construct influences the answers on the specific items in the scale (Diamantopoulos et al., 2008). In this case, the three unrelated indicators of influence over assets, power, and control are factors of socioeconomic status (Mueller & Parcel, 1981). Each indicator assesses a unique component of socioeconomic status. Therefore, a low reliability would be expected because the individual items are not necessarily related but are united to define the construct. Additionally, the reliability is consistent with previous research (Kehoe & O’Hare, 2010). The scale includes dichotomous yes/no items as well as additional questions including “Does your family own a car, truck, or van?” and “How many bathrooms are in your home?”

Unweighted grade point average. Academic performance is operationalized as unweighted grade point average (GPA). Unweighted GPA was calculated by averaging the self-reported class grades taken in Fall 2017 by undergraduate participants, without accounting for differences in the number of credits that were associated with each class (i.e., weighted GPA, which is usually what is reported on college transcripts). Unweighted GPA is the measure of academic success in this study.

Control variables. Gender was used as a covariate in the study. Participants answered a single item question, “What is your gender?” with the following responses: male, female, non-

binary/third gender, prefer not to say, or prefer to self-describe. The analyses excluded any respondent whose gender was selected as something other than female or male because the sample size was too small for reliable analysis. First-generation status of the student was also used as a dichotomous covariate (first-generation/non-first-generation) in the study. Participants responded to the following question, “Are you a first-generation college student?” with either Yes or No. Finally race and ethnicity was used as a covariate in analysis. Participants were presented with “What is your race and ethnicity?” and the following answer choices: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, White or European, Other-please specify. Race was dichotomized into White and Non-White categories for analysis.

RESULTS

The descriptive statistics and correlations of the study variables are presented in Table 1. A review of the correlations revealed that impact of Harvey was correlated with distress ($r = .18$). Conscientiousness was also correlated with distress ($r = -.18$). Further, several other variables were correlated with each other. Looking ahead to testing hypotheses, these correlations raise the concern of possible multicollinearity, which means that independent variables in the model may be highly correlated and could cause difficulty assessing coefficients in regressions (Field, 2018). However, that was not the case here as variance inflation factors for all variables was near one, indicating that multicollinearity is not an issue in the data.

Hypothesis 1

Hypothesis 1 proposed that the impact of natural disasters was negatively related to academic success. A hierarchical regression was conducted to test this hypothesis (see Table 2). Model 1 included race, gender, and first-generation status as covariates. Model 2 included impact of Hurricane Harvey as the predictor variable. The change in R^2 was not significant with the addition of impact of Hurricane Harvey to the model, $R^2 = .028$, $F(1, 347) = .223$, $p = .637$. Thus, Hypothesis 1 was not supported; there is no direct effect of the impact of Hurricane Harvey on unweighted GPA.

Hypothesis 2

Hypothesis 2 predicted that the impact of natural disasters on students was positively related to psychological distress. To test this hypothesis, I conducted a hierarchical regression with race, gender, and first-generation status as covariates in Model 1 (see Table 3). The impact of Hurricane Harvey was entered into Model 2 as the predictor variable. The change in R^2 was significant with the addition of impact of Hurricane Harvey to the model, $R^2 = .044$, $F(1, 347) =$

10.079, $p = .002$. Therefore, Hypothesis 2 was supported; as the impact of Harvey increased, so did student's psychological distress.

Hypothesis 3

Hypothesis 3 proposed that psychological distress from natural disasters would be negatively related to academic success among students. I conducted a hierarchical regression to test this hypothesis (see Table 4). Similar to the previous hypotheses, race, gender, and first-generation status were entered into Model 1 as covariates. Psychological distress was entered into Model 2 as the predictor variable. The change in R^2 was not significant with the addition of psychological distress into the model, $R^2 = .038$, $F(1, 347) = 3.640$, $p = .057$. As such, Hypothesis 3 was not supported; psychological distress did not have an effect on students' unweighted GPA.

Hypotheses 4–9

To test Hypotheses 4–9 that the relationship between the impact of Hurricane Harvey (X) and academic success (Y) would be mediated by psychological distress (M) at different levels of the Big Five Personality Traits and SES (W), I conducted individual moderated mediation analyses with the PROCESS macro (Hayes, 2013) using Model 14. I controlled for gender, race and first generational student status in each of these analyses. The index of moderated mediation was used to test for moderated mediation with bootstrap confidence intervals samples set at 5000 (Hayes, 2015). The analyses were also examined using the piecemeal approach, which is testing for mediation and moderation separately and analyzing the results combined (Edwards & Lambert, 2007). This additional approach was included because it has been used more commonly in the past, and the index of moderation is a relatively new approach to analyzing moderated mediation. As such, both approaches are presented for comparison. To test for the

mediation of Harvey impact on academic success through psychological distress, I conducted a simple mediated regression analysis with the PROCESS macro (Hayes, 2018) using Model 4 and controlled for gender, race and first generational student status. To examine significance, bootstrapping with 5000 samples was used to create the 95% confidence intervals. To test for the moderation of the individual differences on the relationship between psychological distress and academic success, I conducted individual moderated regression analyses (see Table 5) with the PROCESS macro (Hayes, 2018) using Model 1 and also controlled for gender, race and first generational student status.

Given the circumstance that the mediation (see Table 6) results were the same for every moderated mediation hypothesis (Hypotheses 4-9), they are presented once to reduce redundancy. There was not a significant indirect effect of Harvey impact on academic success through psychological distress, $b = -.009$, 95% CI [-.026, .002].

Openness to experience. As noted, Hypothesis 4 predicted that openness to experience would moderate the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress. The index of moderated mediation (see Table 7) was not significant, $b = .0015$, 95% CI [-.0132, .0183] (see Table 13). The piecemeal approach was congruent with the index of moderated mediation as neither mediation nor moderation were significant. Specifically, openness to experience did not moderate the effect of distress on academic success as evidenced by the increase in total variance explained of 1.1%, which was not statistically significant, $b = .011$, $t(345) = .196$, $p = .85$. As such, Hypothesis 4 was not supported.

Conscientiousness. Hypothesis 5 proposed that conscientiousness would moderate the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress. The index of moderated mediation (see Table 8) results were not significant, $b = .0018$, 95% CI [$-.0108$, $.0190$]. Similarly, the results of the piecemeal approach conclude that the interaction of conscientiousness and psychological distress did not predict academic success, $b = .006$, $t(345) = .106$, $p = .92$. Thus, Hypothesis 5 was not supported.

Extraversion. Hypothesis 6 proposed that extraversion would moderate the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress. The index of moderated mediation (see Table 9) was not significant, $b = .0026$, 95% CI [$-.0092$, $.0159$]. Additionally, the results of the moderation analysis indicated that the interaction of extraversion and psychological distress did not predict academic success, $b = .012$, $t(345) = .308$, $p = .76$. As such, Hypothesis 6 was not supported.

Emotional stability. Hypothesis 7 predicted that emotional stability would moderate the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress. The index of moderated mediation (see Table 10) was not significant, $b = .0085$, 95% CI [$-.0028$, $.0275$]. Moreover, emotional stability did not moderate the effect of distress on academic success, $b = .062$, $t(345) = 1.442$, $p = .105$. Thus, Hypothesis 7 was not supported.

Agreeableness. Hypothesis 8 predicted that agreeableness would moderate the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress. The index of moderated mediation (see Table 11) was not significant, $b = -.0011$, 95% CI [$-.0167$, $.0162$]. Also, the interaction between agreeableness and psychological distress did not predict academic success, $b = -.008$, $t(345) = -.164$, $p = .87$. Therefore, Hypothesis 8 was not supported.

Socioeconomic status. Hypothesis 9 proposed that student socioeconomic status would moderate the second stage of the indirect effect of impact of natural disasters on student success through psychological distress, such that students who are more impacted by natural disasters will experience reduced success through increased psychological distress. The index of moderated mediation (see Table 12) was not significant, $b = .0012$, 95% CI [$-.0049$, $.0073$]. The interaction of socioeconomic status and psychological distress did not predict academic success, $b = .009$, $t(345) = .460$, $p = .65$. As such, the piecemeal approach was in agreement that Hypothesis 9 was not supported.

DISCUSSION

The purpose of the study was to examine the effect of individual level factors as moderators of the negative effect of distress from natural disasters on academic success. Premised on COR and the transactional model of stress, I expected openness to experience, conscientiousness, extraversion, emotional stability, agreeableness, and socioeconomic status would act as resources tempering the effects of stress on academic success. Texas A&M University students were surveyed online in Spring of 2018 regarding personality traits, SES, distress, and academic success.

The results indicated that the impact of Hurricane Harvey was not negatively related to academic success (Hypothesis 1); however, the impact of Hurricane Harvey on students was positively related to psychological stress (Hypothesis 2). Hypothesis 3 which proposed that psychological distress would be negatively related to academic success among students was not supported. Further, none of the individual level factors investigated were found to moderate the negative effect of distress from natural disasters on academic success (Hypotheses 4-9).

Implications

The current study introduces personality traits and socioeconomic status as potential moderators of the relationship between distress from natural disasters on academic success. The present study found that the impact of Hurricane Harvey was not negatively related to academic success. While this result was unexpected, a study by Di Petro (2018) found that natural disasters do not always result in decreased educational success of college students. Further, the impact of Hurricane Harvey on grades may have been tempered by actions of university. For example, the university delayed the start of the semester by two days, created multiple relief funds, and established an online form to streamline relief and support efforts;

similarly, members of the student body engaged in individual acts of kindness and support for impacted fellow students (Hurricane, 2017b). Additionally, because the study was conducted the semester after Harvey, it is possible that the students who were most negatively impacted by the hurricane and/or had the least academic success were not in the university population at the time of the study.

Although the results of the current study were not as expected, research on natural disasters and higher education is still imperative. One concern that students will definitely contemplate is how quickly they can complete their degree and whether completion is a possibility due to their experiences with natural disasters. While the setting of this study, the university, was too far from the storm for it to be problematic for the long-term functioning of the university, other natural disasters such as Hurricane Katrina caused enough damage to relocate students to other universities or possibly withdraw. Natural disasters may slow progress or even prevent students from completing programs. Students who attend college but do not complete their programs of study may have to pay loans without the benefit of higher pay associated with obtaining higher education.

The success of students in college is not only important to the student but also to universities. Specific to higher education, there are expectations among students of successful completion of their respective programs. Further, there are calls to hold institutions accountable for the success of students given the amounts of money they are receiving. State funding for higher education institutions account for enrollment when allocating funding; however, several states have begun to introduce policies in which funding is performance-based, such as graduation rates (Hillman, Tandberg, & Gross, 2014). As such, the current study provides insight

into the impact of natural disaster which may be impactful for universities and students. The next section will provide proposed explanations for the results.

The finding that Hurricane Harvey was positively related to psychological distress provides additional support for the well-established effect that natural disasters are stressful (Beaglehole, 2018). The study did not support the hypothesis of Hurricane Harvey or psychological distress impacting academic success. Unlike some previous studies of college samples (Davis et al., 2010; Di Pietro, 2018; Sacerdote, 2012), the current sample did not have to relocate due to the natural disaster. This difference between previous samples and the current study may help explain why neither Harvey nor psychological distress affected academic success, because the current sample does not have to deal with disturbances caused by relocation.

Limitations

As with all other research, this study is not without limitations. The sample only consists of introductory psychology students from Texas A&M University who chose to participate. The study would be more comprehensive and better represent the population if students at other universities that have been impacted were included as participants and if the sample were randomly drawn from the population.

Another limitation is that the survey was administered the semester following the hurricane. More specifically, students who were most impacted by Hurricane Harvey might have been most likely to withdraw during Fall 2017 when Harvey struck and possibly not return the following semester; thereby, the sample may have been truncated and the people who most represent the phenomenon of interest were not present in the sample. Additionally, a comparison of the current sample to that of another traumatic event at or near Texas A&M, such as other

natural disasters or even the 2013 West Fertilizer explosion, may also provide some insight into the impact of Hurricane Harvey.

Additionally, the study was cross-sectional and retrospective. As such, the issue of reverse causality is of concern. Specifically, the psychological distress may be a result of the grades that the students made rather than the hypothesized relationship that decreased grades would be a result of increased psychological distress. The timing of the study--after grades were known for Fall 2017--may have exacerbated this possible effect, as students might have been more distressed before finding out their grades and less distressed after they received them, regardless of what the grades were, due to the lack of certainty about their grades. Alternatively, some students may have been less distressed prior to receiving their grades because they anticipated better grades than they received. Another potential limitation is the survey only consists of self-report measures. However, as many of the measures were about the person and their experiences, their personality, and their identity, it seems likely that the participant would be the best informant for these variables. This is a complicated trade-off with concerns about common source biases, like many other studies that link personality with experiences of events and distress.

Another possible limitation is the focus on overall GPA at the end of the semester as an indicator of academic success and performance. If the study focused on academic success of students at the class level over time, then different results might have been found. In the context of Harvey, students might have had poorer performance at the start of the semester, shortly following Harvey, and then experienced increased academic success as the semester progressed. Thus, grades closer in time following the disaster may have been lower, while those more distal but still within the semester might have been higher, together creating the overall course grade

and contributing to GPA. It would be interesting to examine the timing of the natural disaster relative to important milestones in classes.

While the results of the current study were not as I expected, I believe that the hypothesized model may extend beyond situations such as natural disasters. More specifically, I propose additional boundaries should be tested.

The first suggested boundary to be examined is acuteness. As previously stated, a primary tenet of COR suggests that the chief concern for individuals is loss of resources (Hobfoll, 1989). As such, a judgment of the acuteness or severity of the situation determines if stress actually occurs for an individual. While the present study did investigate the impact of natural disaster objectively, a clearer picture would emerge if a subjective measurement was included. Impact of natural disasters focuses on physical items that are damaged or lost. On the other hand, judgment of acuteness or severity would be a subjective evaluation of the impact of the loss. This distinction is important because resource loss can have a differential impact on individuals. For example, suppose two people lose their vehicles due to a hurricane. A person at a location with adequate public transportation would be at less of a loss compared to a person in a rural community without public transportation. As demonstrated, the same loss has a distinct impact on each individual.

Another boundary to consider is the degree of transience. If a situation is fleeting, resource loss may be minimized. Additionally, the ability to gain resources may not be impacted as much. For example, job loss leads to decreased income. However, a short furlough will have less resource loss in comparison to permanent unemployment such as business closure. Moreover, the length of time an individual is unable to gain resources is also impacted. Further, unused resources lose efficacy over time (Hobfoll, 1991).

Finally, researchers should investigate predictability as a boundary condition. Once again, COR revolves around gaining or maintaining resources (Hobfoll, 1989). Predictability allows individuals the ability to prepare for harmful situations and thus can impact resource loss. Adding to the previous example, if a person is able to plan for situations that involve resource loss, the damage may be minimized. As such, predictability is a factor that should be considered for further testing.

Future Directions

While future research should continue on this understudied niche of college students impacted by natural disasters, in light of the results of this study, one should consider other paths that would be more beneficial to the population. One method of research on this population that may be beneficial and has limited exposure is longitudinal research of undergraduate students impacted by natural disaster. Longitudinal research can provide information on changes over time which could shine a light on when to provide help. For example, as proposed above, it is possible that students demonstrated academic performance decrements just after the natural disaster and improved over time. Longitudinal research could demonstrate when best to provide academic support; for example, it's possible that immediate help would be overwhelming to students who are already juggling multiple problems (school, adjustment, natural disaster recovery) and supplying academic support might be more useful a few weeks later once students have had a chance to assess their resources and challenges. Further, a study with a pre-post design, while difficult to achieve with natural disasters, would provide more accurate insights about the impact of natural disasters. However, the unanticipated nature of natural disasters makes applying this method extremely difficult in natural disaster research.

Nature alone does not account for all consequences of natural disasters (Neumayer & Plumper, 2007). Research on the differential impact of natural disasters beyond the primary damage caused by nature is important and a partial focus of the vulnerability approach to natural disasters (Neumayer & Plumer, 2007). There are multiple factors to consider including race, gender, sexual orientation, education level of caretakers, and household members of students. These specific factors are vital to investigate because they each affect power and resources. More clearly stated, each of these factors presents a way to exert control, influence change and satisfy demands. Additionally, these factors, among others, have been listed as contributors to social vulnerability in natural disasters, which is the susceptibility of various identities to adapt to consequences of natural disaster (Singh, Eghdami, & Singh, 2014).

Furthermore, the research on differential impact on these various identities would be especially useful because it would shift the research closer toward intersectionality. Intersectionality suggests that various minoritized identities overlap to define a person's experiences (Crenshaw, 1989). By looking at the research through an intersectional lens, researchers are provided with a critical viewpoint that produces a more detailed and accurate depiction of the lived experiences of minoritized people. Furthermore, intersectionality allows researchers to see issues from a more complex perspective that accounts for not only obvious problems related to various identities, but also problems that are missed when focusing on individual identities that an individual may hold. For example, the impact of a natural disaster would not be the same for all women; instead, differences would be showcased when examining various other identities (social class, age, race, sexual orientation, etc.) that the women possess. While the previously stated example illustrated intersectionality on an individual level, it should be noted that intersectionality provides for multiple levels of analysis. At the microscopic level,

intersectionality highlights individual actors and at the macroscopic level it draws attention to systems and organizations (Pelak, 2007). Thereby, minoritized populations are better served, providing more focused information around their various identities.

CONCLUSION

This study attempts to provide understanding of traits that can influence the relationship among the impact of natural disasters, psychological distress, and academic success. However, the current study suggests that personality traits and SES do not moderate the relationship between psychological distress and academic success in the context of a natural disaster like Hurricane Harvey. On the other hand, the study found that the impact of Hurricane Harvey on students was positively related to psychological stress. Thus, although it is clear that natural disasters like Hurricane Harvey are stressful, it is unclear if they have an impact on student success.

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APPENDIX A

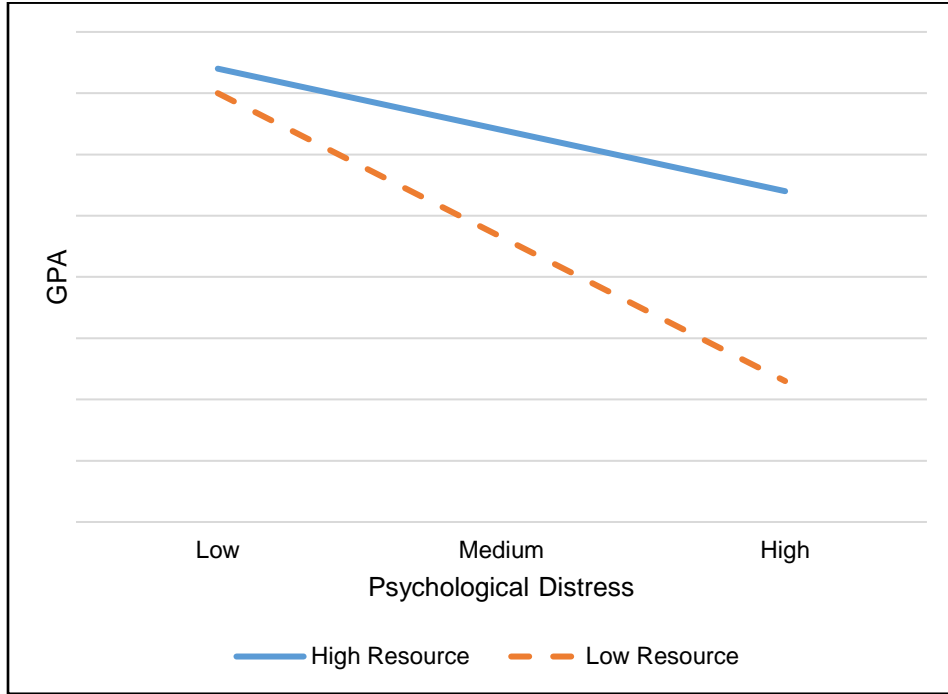


Figure 1. Proposed Ordinal Interaction Effects. Proposed Ordinal Interaction Effects. This figure demonstrates the proposed moderation effects for resources (openness to experience, conscientiousness, extraversion, agreeableness, emotional stability, and socioeconomic status) on the relationship between psychological distress and unweighted grade point average.

APPENDIX B

Unweighted Grade Point Average

Participants indicated the amount of each grade they made throughout the semester.

How many of each grade did you make Fall 2017 semester?

- A
- B
- C
- D
- F
- Q-drop

Brief Symptom Inventory (BSI; adapted from Derogatis & Spencer, 1982)

Items are rated on a 6-point Likert type scale that has anchors from 0 (never) to 5 (once a week or more).

Since Harvey, have you had any of the following symptoms?

1. Nervousness or shakiness inside
2. Feeling easily annoyed or irritated
3. Thoughts of ending your life
4. Suddenly scared for no reason
5. Temper outburst that you could not control
6. Feeling lonely
7. Feeling tense or keyed up
8. Having urges to beat, injure, or harm someone
9. Feeling blue
10. Feeling no interest in things
11. Feeling fearful
12. Having urges to smash or break things
13. Spells of terror or panic

The Big Five Inventory 10 (BFI-10; Rammstedt & John, 2007)

Items were rated on a five-point Likert-type scale that has anchors from 1 (disagree strongly) to 5 (agree strongly).

In general, I see myself as someone who...

1. Is reserved
2. Is generally trusting
3. Tends to be lazy
4. Is relaxed and handles stress well

5. Has few artistic interests
6. Is outgoing, sociable
7. Tends to find fault with others
8. Does a thorough job
9. Gets nervous easily
10. Has an active imagination

Loss Impact Index

Did any of the following happen to you because of Hurricane Harvey? Yes or No

- Lose property
- Family lose property
- Lose housing
- Family lose housing
- Injured
- Friends/Family injured
- Pets injured or lost
- Financial burden or money problems
- Family had financial burdens or money problems

Family Affluence Scale III (FAS-3; adapted from Hartley, Leven & Currie, 2016)

Items were dichotomous with yes/no responses and closed-ended.

Answer the following yes or no questions.

1. Does your family own a car, van, or truck?
2. At your family residence, do you have your own bedroom for yourself?
3. Do you ever go to bed hungry because there is not enough money to buy food?
4. Do you have a bed of your own?
5. Do you have your own computer?
6. Do you have a home with an outdoor space attached (e.g., backyard)?
7. Does your family have a holiday (vacation) house/apartment?
8. Does your family have a dishwasher?
9. Does your family have a washing machine?
10. Does your family have a tumble dryer?
11. Do you have internet access at home (not including internet access from a cell phone)?
12. Do your parents pay people to do work in your home (e.g. cleaning, cooking, lawn mowing)?
13. Do you receive pocket money or an allowance?
14. Do you wear clothes that belonged to others before you (or share clothes with you siblings)?
15. Do you have a cell phone?

16. During the past 12 months, how many times did you travel away on holiday with your family?
- 0
 - 1
 - 2
 - 3
 - 4
 - 5 or more
17. How many times in the last month have you not been able to afford to do something you wanted to do (e.g. go out with friends, do sports, buy clothes, go to a club or concert)?
- 0
 - 1
 - 2
 - 3
 - 4
 - 5 or more
18. How many bathrooms (room with a bath or shower) are in your home?
- 0
 - 1
 - 2
 - 3
 - 4
 - 5 or more

Demographics

1. What is your age?
2. What is your gender
 - Male
 - Female
 - Non binary/third gender
 - Prefer not to say
 - Prefer to self-describe_____
3. Are you a first-generation student?
 - Yes
 - No
4. What is your race and ethnicity? Please check all that apply.
 - American Indian or Alaska Native
 - Asian
 - Black or African American
 - Native Hawaiian or other Pacific Islander
 - White or European American
 - Other (please specify)

5. What is your sexual orientation?
 - Homosexual
 - Heterosexual
 - Bisexual
 - Prefer not to say
 - Prefer to self-describe
6. Is English the primary language spoken in your household?
 - Yes
 - No
7. If no, what is your primary language spoken in your household?
8. What is your immigration status?
 - US Citizen
 - US Permanent Resident
 - International student on a student visa
 - Undocumented
 - Prefer not to say

APPENDIX C

Table 1.

Means, Standard Deviations, and Correlations of Study Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. HIS	.54	1.14										
2. Distr	1.48	.83	.18**									
3. GPA	3.27	.64	-.03	-.10								
4. Open	3.41	.90	.13*	.06	.02							
5. Cons	3.65	.78	.03	-.18**	.18**	-.05						
6. Extra	3.21	1.12	.04	-.08	.06	-.02	.24**					
7. Emot	3.09	1.05	.03	.22**	.04	.02	-.17**	-.29**				
8. Agree	3.79	.82	.04	-.13*	-.03	.05	.18**	.018**	-.16**			
9. SES	8.26	2.15	-.10	-.08	.14**	-.03	.01	.32**	-.12*	.10		
10. Age	19.63	1.30	.04	.03	.08	-.03	.13*	.03	-.08	-.07	-.12	
11. Gen	1.74	.44	.01	.01	.13*	-.02	.09	.10	-.01	-.07	.30**	-.05

Note. N=354 HIS = Harvey Impact Score. Dist = Psychological Distress. GPA = Unweighted Grade Point. Open = Openness to Experiences. Cons = Conscientiousness. Extra = Extraversion. Agree = Agreeableness. Emot = Emotional Stability. SES = Socioeconomic Status. Gen = First Generation Student. ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the .05 level (2-tailed).

Table 2.

Hierarchical Regression Testing the Effect of Impact on Academic Success

		Academic Success			
		<i>B</i>	<i>SE</i>	<i>t</i>	<i>R</i> ²
Model 1	Race	.056	.078	.724	.028
	Gender	-.144	.081	-1.779	
	1 st Gen	.183*	.082	2.238	
Model 2	Impact	-.014	.030	-.473	.028
ΔR^2		.001			

Note. Impact = Impact of Hurricane Harvey. * $p < .05$, ** $p < .001$.

Table 3.

Hierarchical Regression Testing the Effect of Impact on Psychological Distress

		Psychological Distress			
		<i>B</i>	<i>SE</i>	<i>t</i>	<i>R</i> ²
Model 1	Race	-.173	.099	-1.742	.017
	Gender	.177	.103	1.718	
	1 st Gen	.062	.104	.593	
Model 2	Impact	.120*	.038	3.175	.044
ΔR^2		.028			

Note. Impact = Impact of Hurricane Harvey. * $p < .05$, ** $p < .001$.

Table 4.

Hierarchical Regression Testing the Effect of Distress on Academic Success

		Academic Success			
		<i>B</i>	<i>SE</i>	<i>t</i>	<i>R</i> ²
Model 1	Race	.056	.078	.724	.028
	Gender	-.144	.081	-1.779	
	1 st Gen	.183*	.082	2.238	
Model 2	Distress	.080	.042	-1.908	.038
ΔR^2		.010			

Note. Distress = Psychological Distress. * $p < .05$, ** $p < .001$.

Table 5.

Interaction of Psychological Distress and Individual Differences on Academic Success

Variable	Academic success				
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>R</i> ²	ΔR^2
PD x Openness	.011	.056	.196	.039	.000
PD x Conscien.	.006	.053	.106	.063	.000
PD x Extra.	.012	.039	.308	.040	.000
PD x Emo. Sta.	.062	.043	1.442	.050	.006
PD x Agree.	-.008	.050	-.164	.038	.000
PD x SES	.009	.020	.460	.048	.001

Note. PD = Psychological Distress, Openness = Openness to experience, Conscien. = Conscientiousness, Extra. = Extraversion, Emo. Sta. = Emotional Stability, Agree. = Agreeableness, SES = Socioeconomic status. * $p < 0.05$ level.

Table 6

Direct and Indirect Effects with Distress as the Mediator

Antecedent	Consequence					
	Distress (M)			GPA (Y)		
	Coeff.	SE	<i>p</i>	Coeff.	SE	<i>p</i>
Harvey Impact (X)	.1264	.0380	.0010	-.0054	.0307	.8600
Distress (M)	-	-	-	-.1129	.1966	.5662
Race	-.1622	.0988	.1016	.0466	.0782	.5517
Gender	.1618	.1027	.1162	-.1275	.0814	.1180
1 st Gen	.0634	.1038	.5419	.1883	.0820	.0223
Constant	1.3579	.1206	.0000	3.2964	.3216	.0000
	R ² = .0467			R ² = .0374		
	<i>F</i> (4, 348) = 4.2655, <i>p</i> = .0022			<i>F</i> (7,345) = 1.9143, <i>p</i> = .0664		

Note. **p* < .05, ***p* < .001.

Table 7.

Coefficients from Conditional Process Model with Openness to Experience as the Moderator

Antecedent	Consequence					
	Distress (M)			GPA (Y)		
	Coeff.	SE	P	Coeff.	SE	p
Harvey Impact (X)	.126	.0380	.0010	-.005	.031	.860
Distress (M)	-	-	-	-.113	.197	.566
Openness (W)	-	-	-	.003	.087	.972
M x W	-	-	-	.012	.056	.837
Race	-.162	.0988	.1016	.047	.078	.552
Gender	.162	.1027	.1162	-.128	.081	.118
1 st Gen	.063	.1038	.5419	.188	.082	.022
Constant	1.358	.1206	.0000	3.296	.322	.000
	$R^2 = .047$			$R^2 = .037$		
	$F(4, 348) = 4.266, p = .002$			$F(7,345) = 1.914, p = .066$		

Note. Openness = Openness to Experience. * $p < .05$, ** $p < .001$.

Table 8.

Coefficients from Conditional Process Model with Conscientiousness as the Moderator

Antecedent	Consequence					
	Distress (M)			GPA (Y)		
	Coeff.	SE	P	Coeff.	SE	P
Harvey Impact (X)	.126	.038	.001	-.011	.030	.730
Distress (M)	-	-	-	-.096	.180	.594
Consc. (W)	-	-	-	.115	.092	.211
M x W	-	-	-	-.140	.053	-.090
Race	-.162	.099	.102	.028	.077	.718
Gender	.162	.103	.116	-.140	.080	.081
1 st Gen	.063	.104	.542	.174	.081	.033
Constant	1.358	.121	.000	2.881	.335	.000
	R ² = .047			R ² = .063		
	F(4, 348) = 4.2655, p = .002			F(7, 345) = 3.285, p = .002		

Note. Consc. = Conscientiousness. * $p < .05$, ** $p < .001$.

Table 9.

Coefficients from Conditional Process Model with Extraversion as the Moderator

Antecedent	Distress (M)			Consequent		
	Coeff.	SE	P	Coeff.	SE	p
Harvey Impact (X)	.126	.038	.001	-.006	.031	.838
Distress (M)	-	-	-	-.132	.124	.290
Extra. (W)	-	-	-	-.003	.062	.966
M x W	-	-	-	.021	.039	.596
Race	-.162	.099	.102	.049	.078	.535
Gender	.162	.103	.116	-.128	.081	.117
1 st Gen	.063	.104	.542	.183	.082	.027
Constant	1.358	.121	.000	3.309	.216	.000
	R ² = .047			R ² = .039		
	F(4, 348) = 4.266, p = .002			F(7, 345) = 2.018, p = .052		

Note. Extra = Extraversion. * $p < .05$, ** $p < .001$.

Table 10.

Coefficients from Conditional Process Model with Emotional Stability for the Moderator

Antecedent	Consequence					
	Distress (M)			GPA (Y)		
	Coeff.	SE	<i>p</i>	Coeff.	SE	<i>p</i>
Harvey Impact (X)	.126	.038	.001	.003	.030	.919
Distress (M)	-	-	-	-.328	.161	.042
Emo. Sta. (W)	-	-	-	-.043	.069	.5390
M x W	-	-	-	.067	.043	.120
Race	-.162	.099	.102	.039	.078	.617
Gender	.162	.103	.116	-.155	.082	.060
1 st Gen	.063	.104	.542	.189	.081	.021
Constant	1.358	.121	.000	3.516	.254	.000
	R ² = .047			R ² = .0497		
	F(4, 348) = 4.2655, <i>p</i> = .002			F(7, 345) = 2.576, <i>p</i> = .013		

Note. Emo. Sta. = Emotional Stability. **p* < .05, ***p* < .001.

Table 11.

Coefficients from Conditional Process Model with Agreeableness for the Moderator

Antecedent	Consequence					
	Distress (M)			GPA (Y)		
	Coeff.	SE	P	Coeff.	SE	P
Harvey Impact (X)	.126	.038	.001	-.002	.031	.940
Distress (M)	-	-	-	-.044	.184	.809
Agree (W)	-	-	-	-.006	.085	.947
M x W	-	-	-	-.009	.050	.862
Race	-.162	.099	.102	.048	.078	.542
Gender	.162	.103	.116	-.124	.082	.128
1 st Gen	.063	.103	.542	.187	.082	.024
Constant	1.358	.121	.000	3.329	.340	.000
	R ² = .047			R ² = .037		
	F(4, 348) = 4.266, p = .002			F(7, 345) = 1.904, p = .068		

Note. * $p < .05$, ** $p < .001$.

Table 12.

Coefficients from Conditional Process Model with SES for the Moderator

Antecedent	Consequence					
	Distress (M)			GPA (Y)		
	Coeff.	SE	P	Coeff.	SE	p
Harvey Impact (X)	.126	.038	.001	.002	.030	.935
Distress (M)	-	-	-	-.142	.167	.394
SES (W)	-	-	-	.018	.033	.585
M x W	-	-	-	.009	.020	.647
Race	-.162	.099	.102	.029	.078	.714
Gender	.162	.103	.116	-.129	.081	.113
1 st Gen	.063	.104	.542	.148	.084	.079
Constant	1.358	.121	.000	3.190	.282	.000
	R ² = .047			R ² = .046		
	F(4, 348) = 4.266, p = .002			F(7, 345) = 2.395, p = .021		

Note. SES = Socioeconomic Status. * $p < .05$, ** $p < .001$.

Table 13.

Index of Moderated Mediation

Moderator	Index	SE (Boot)	BCCI	
			Lower	Upper
Openness	.0015	.0078	-.0132	.0183
Conscientiousness	.0018	.0074	-.0108	.0190
Extraversion	.0026	.0062	-.0092	.0159
Emotional Stability	.0085	.0079	-.0028	.0275
Agreeableness	-.0011	.0079	-.0167	.0162
SES	.0012	.0030	-.0049	.0073

Note: BCCI: Bias corrected confidence interval. Bootstrapping based on n = 5000 subsamples.