Predicting Anxiety and Depression Symptom Changes in College Students: An Exploration of a Higher Education Preventive Mental Health Intervention and Student Outcomes

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Abstract

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Approximately 35% of college students meet diagnostic criteria for a mental health disorder and symptoms of anxiety and depression prevail as the most common mental health issues among undergraduates. Unfortunately, only 10% of college students who indicated they would benefit from mental health services stated that they received care. Tiered, social emotional programming may be an upstream approach to address this public health crisis. A preventive mental health course offered at a large, four-year, public university teaches students skills related to mindfulness, distress tolerance, emotion regulation, interpersonal effectiveness, and cognitive restructuring which may reduce symptoms of anxiety and depression, while equipping students with skills to respond to future stressors more effectively. Study participants included undergraduate students (35.4% = White, 2.2% = Black, 0.4% = American Indian, 47.8% = Asian, 8.4% = Latinx; 24.3% = Male, 74.8% = Female). Participants were 18-39 years old (M = 18). Student symptoms of anxiety and depression were measured utilizing indices obtained from the Brief-Symptom Inventory (BSI-18) while student attitudes about stress were measured using

the Stress Mindset Measure (SMM). Multiple linear regression models with sequential predictor entry were used to determine the unique effect of student pre-intervention internalizing symptom levels on change in psychopathology after controlling for the interaction effects among student demographic factors. Results suggest higher pre-intervention levels of anxiety moderately predicted decreases in anxiety levels, while higher pre-intervention levels of depression moderately predicted decreases in depression levels among this general college student population. Stress mindset significantly interacted with pre-intervention levels of anxiety on depression symptom change. The following study extends the literature on social-emotional learning programming into the higher education context and by responding to this alarming public health crisis from a solution-focused prospective.

Keywords: Preventive mental health, undergraduate, anxiety, depression, stress mindset.

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Chapter 1: Introduction

The transition from adolescence to emerging adulthood as a college student is particularly challenging (Burt & Paysnick, 2012; Taylor et al., 2014). College students endorse stressors related to finances (Britt et al., 2015; Horgan et al., 2018; Lim et al., 2014; Robb, 2017), relationships (Hurst et al., 2013; Mahmoud et al., 2012; Stoliker & Lafreniere, 2015), diversity (Arbona et al., 2018; Clark & Mitchell, 2018; Cokley et al., 2017; Hurst et al., 2013; McClain et al., 2016), and academics (American College Health Association [ACHA], 2018; Watson & Watson, 2016) as leading sources of distress. Stressors, paired with common stress-as-debilitating mindsets, and a lack of positive coping skills can negatively impact student outcomes (Bayram & Bilgel, 2008). Unfortunately, the well-being of college students has been described as a public health crisis (American Psychological Association [APA], 2017; Oswalt et al., 2020). And yet, approximately only 10% of college students who indicated they would benefit from mental health services stated that they receive mental health services (Rosenthal & Wilson, 2008) and current service models within the higher education setting are described as overburdened, reaction versus preventive, and unable to meet student demands (Locke et al., 2016; Novotney, 2014; Pedrelli et al., 2015). Overall attitudes about stress may serve as protective factors (Crum et al., 2013; Crum et al., 2017; Goyer et al., 2018; Kilby & Sherman, 2016) and social emotional preventive programming may be an up-stream approach to address this crisis. Innovative research and intervention are required to address this mental health epidemic.

Preliminary research findings support that socioemotional learning programs designed to target the universal college population may effectively decrease students' self-reports of perceived stress, psychological symptomology, and measures of well-being (Conley et al.,

2013a; Dvořáková et al., 2017). Unfortunately, there is very little literature to support how universities may comprehensively address this mental health crisis.

A multi-tiered systems of support (MTSS) service delivery model, or public health approach to preventing and treating illness and disease, is a promising framework (Brown-Chidsey & Bickford, 2015; Conley et al., 2015; Cook et al., 2015; McIntosh & Goodman, 2016). According to a wealth of research conducted in primary and secondary school settings, an acceptable continuum of care ranging from preventive to targeted, and individual levels of services would be more cost-effective, equitable, and efficient in student's academic and social-emotional growth than current, reactive on-campus mental health models (Collins et al., 2019; Conley et al., 2013b; Conley et al., 2015; Cook et al., 2015; Dowdy et al., 2010).

Unfortunately, there is a paucity of research illustrating a clear road map as to how universities have instituted an effective public health approach in response to this mental health crisis (Parcover et al., 2015). A proposed first step would be to establish an effective, universal mental health prevention course. While SEL research designed for college-age students is in its infancy, the application of evidence-based practices, specifically mindfulness (Canby et al., 2015; Cavanaugh et al., 2018; Parcover et al., 2018), relationship skills (Schwartz et al., 2018; Waithaka et al. 2015), and coping skills (Byrd & McKinney, 2012; Conley et al., 2013a; Conley et al., 2013b; Winzer et al., 2018) show some promise.

Chapter 2: Literature review

The previous chapter outlined a general summary of the topic and some of the challenges facing students and the university-based settings. Chapter two provides a comprehensive review of the current literature pertaining to emerging adulthood mental health experienced by undergraduate students, the current models and barriers at university settings to address the mental health needs of their students, and finally how this study and the research questions address some of the current gaps in the field.

Emerging Adulthood

In the media, college attendance is oftentimes glorified as a social utopia, ripe with opportunities to develop new relationships, a place to party whereby drinking is perceived to be an integral component of the college experience (National Institute of Health [NIH], 2021), and an opportunity to get away from restrictions associated with home (Bayrak, 2020). Multibillionaire, Elon Musk, informed The Guardian, for example, "college is basically for fun," (Aratani, 2020). While these expectations are reinforced via glamorized Hollywood portrayals (Taylor, 2018), students may find their true college experience challenging (Arnett & Hughes, 2014), particularly as they adjust during their first year away from home as emerging adults.

The transition to early adulthood is a time of intense challenge (Taylor et al., 2014). According to Bronfenbrenner, this is a significant ecological change (Bronfenbrenner, 1979). In an evaluation of daily stressors across the lifespan, researchers have found that older adults endorse significantly fewer daily stressors compared to young adults aged 18-25 (Birditt et al., 2005; Stawski et al., 2008). This transition is a unique period associated with personal identity exploration, increased independence, decision-making, new relationships, and career planning

(Arnett, 2000; Arnett & Hughes, 2014) and for many young adults, the transition from adolescence to adulthood often coincides with the transition to college (Venezia & Jager, 2013).

According to the National Center for Education Statistics (NCES), nearly 20 million students enrolled in college in the United States in fall 2020 (Hussar et al., 2020). Comparatively, in 2000, approximately 11.3 million full-time students were enrolled (Snyder et al., 2001). Approximately 42% of American young adults (18-24 years old) are enrolled in college or graduate school (Hussar et al., 2020). Consequently, a significant proportion of the population undergoes this demanding life change. Additionally, approximately 52% of college students identify as White and 54.9% of undergraduate students are women (Hussar et al., 2020). As the data suggests, this is a large and increasingly diverse population that requires special attention as it relates to understanding the unique psychosocial challenges experienced by this substantial proportion of the United States. Additional demographic considerations are further explored below within the context of undergraduate mental health.

Undergraduate Mental Health Crisis

According to the American College Health Association (ACHA), 45.3% of American college students report more than average stress (ACHA, 2019). Students often endorse feeling tremendous pressure to succeed, relationship stressors, and concerns about what they will do after graduation (Beiter et al., 2015). Unfortunately, compounded stressors, if unaddressed, may manifest into more significant mental health issues (Cattaneo & Riva, 2016; Harris, 2010; National Institute of Mental Health [NIMH], 2019) and stress in college is a unique predictor of internalizing mental health issues including depression (Vrshek-Schallhorn et al., 2015) and anxiety (Jones et al., 2018).

Data from the Healthy Minds Study, a national evaluation of student wellbeing, maintains approximately 36% of students on college campuses have a mental health diagnosis (Lipson et al., 2019b). These findings are substantiated by the World Health Organization's World Mental Health International College Project (Auerbach et al., 2018), whereby 35% of first-year college student responses met criteria for one common life-time mental health disorder, and 31% of students screened positive for one 12-month disorder. Unfortunately, given the tendency of students to underreport or not disclose stigmatized mental health conditions (Auerbach et al., 2018; NIMH, 2019), these numbers may be even higher. Internalizing problems are particularly concerning among college students.

Internalizing Problems

Data collected by the Center for Collegiate Mental Health (CCMH) between 2010-2015 across 340 colleges and universities indicate increasing rates of internalizing problems on college campuses specifically (Xiao et al., 2017). Largest effect sizes were indicated for anxiety, depression, and social anxiety (Xiao et al., 2017). Similarly, national survey data collected by the Association for University and College Counseling Directors (AUCCD) supports that internalizing issues, defined as symptoms related to anxiety and depression, are the primary presenting concerns among undergraduate students (LeViness et al., 2019).

Anxiety

Anxiety, in part, can be described as excessive worries and feelings related to being on edge, restlessness, fatigue, difficulties concentrating, irritability, and difficulties sleeping according to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; American Psychiatric Association, 2013). Unfortunately, 65.7% of college students felt overwhelming anxiety in the last twelve months (ACHA, 2019). This is significant, considering

individuals with symptoms related to anxiety do not seek help compared to individuals with other mental illness issues (Johnson & Coles, 2013). Key contributions to students' anxiety-related concerns include academic distress, financial concerns, family and peer relationships, while race and socioeconomic status may have minor effects on the quantity of variance in anxiety (Jones et al., 2018). Therefore, anxiety symptoms may be universal across collegiate student groups.

Depression

A review of the literature from 1990-2010 support that college students, despite being an advantaged social group – generally speaking – experience depression at significantly higher rates compared to their non-college attending peers with a mean prevalence rate of 30.6% (Ibrahim et al., 2013). Recent national survey data supports that 45% of college students felt so depressed that it was difficult to function and 70.8% felt very sad (ACHA, 2019), two symptoms that are consistent with clinical depression according to the 5th edition, *Diagnostic and Statistical Manual of Mental Disorders* (APA, 2013). Research from the National Surveys on Drug and Health support significant increases in the prevalence of major depressive disorder among young adults in 2014 compared to 2005, after controlling for sociodemographic variables (Mojtabai et al., 2016), further implicating the increasingly growing severity of this issue.

Internalizing Issues Among Diverse Student Populations. Because students of color and other historically marginalized student groups such as First-Generation College Students (FGCS) often describe feeling estranged from their campus culture, disconnected from other students and faculty, and that navigation of the college experience is taxing to their wellbeing (Mehta et al., 2011), students from disadvantaged backgrounds may be at greater risk for mental health issues (Xiao et al., 2017). For example, at Predominantly White Institutions (PWIs),

FGCS who also identify with a historically marginalized group are more likely to endorse symptoms indicative of mental health diagnoses compared to their White and continuing generation peers (Hefner & Eisenberg, 2009).

Mental Health Implications

The implications are high with regards to responding to urgency collegiate level mental health needs. Ultimately, as many as 65% of college students experience significant feelings of hopelessness (ACHA, 2019). According to Joiner's Interpersonal Theory of Suicide, the capacity to engage in suicidal behavior, is driven in part, by a thwarted sense of belonging, perceived burdensomeness, and hopelessness regarding these two states (Joiner, 2007; Van Orden, 2010). Large, national survey data collected from numerous college institutions supports 13.3% of college students seriously considered suicide, 2% attempted suicide, 9% intentionally injured themselves in the past year (ACHA, 2019). Lifetime rates of suicidal ideation or attempts are even higher, totaling one in five college students (Mortier et al., 2018). Unfortunately, suicide is a leading cause of death among college campuses (ACHA, 2019). Suicide rates and use of mental health services on campus have significantly increased since 1999 and at the same time, 54% of deaths by suicide were among individuals without a documented or known mental health condition in 2015 (Centers for Disease Control and Prevention [CDC], 2018).

This suggests that there is an opportunity to get "upstream" before the mental health problems begin and provide preventive care to students to promote resilience and foster increased psychological health. Because those who attempt suicide are more likely to have a pervasive mental illness (Goldman-Mellor et al., 2014), research suggests that preventing mental illness may be an effective suicide prevention method on college campuses (CDC, 2018). At the same time, there is an extremely high and unmet need for treatment as only 32.8% of college

students receive treatment for suicidal behaviors as supported by an international evaluation conducted by the World Health Organization who surveyed approximately 14,000 first year-undergraduate participants (Bruffaerts et al., 2018).

On-Campus Mental Health Services & Help-Seeking Behaviors

After adjusting for national increases in enrollment, national survey data supports increases in on-campus counseling services and attended appointments (Xiao et al., 2017), yet less than 50% of students who meet criteria for a mental disorder seek-out or receive services (Zivin et al., 2009). Less than one third of first-year undergraduate students with mental health disorders have received treatment in their lifetime or in the past twelve months (Bruffaerts et al., 2018) and an evaluation of student use of on-campus mental health services shows no differences in over nor under-utilization of counseling services among ethnic minority nor European American students (Hayes et al., 2011). This suggests that there may be common barriers to receiving services across student groups.

Increases in student needs are not reflected in increased staffing nor counseling center budgets; in fact, national college counselor director reports suggest staffing of college counselors have not been adjusted to match rises in student enrollment (Pedrelli et al., 2015). Most counseling center budgets across the country have remain unchanged since 2008, the peak of the Great Recession (Novotney, 2014). Consequently, the most frequent strategies employed by counseling centers to meet increased demands, as best as they can, is to triage students and serve those with highest, acute needs, shorten the number of sessions offered, and reduce outreach initiatives (LeViness et al., 2019). As a result, this decreases opportunities to prevent emerging mental health issues and increases student relapse due to limited session numbers (Locke et al., 2016).

At the same time, 45.5% of surveyed universities across the United States reported that they offered "stepped-care" ranging from peer coaching, wellness group seminars, to individual therapy (LeVinnes et al., 2019). These services were defined as responsive and no data indicated universal-level preventive mental health programming (LeViness et al., 2019). It may be hypothesized that current individual or even small group models for intervention are not sustainable to meet the mental health needs of current collegiate student bodies (Pedrelli et al., 2015).

Students experience obstacles preventing them from receiving mental health support (Ebert et al., 2019). For example, a large study surveying a national representative sample indicates students who identified as needing but had not used counseling services were significantly more likely to be female, Latino, to endorse financial stress, and to work more than 15 hours per week while attending school full time (Nash et al., 2017). Furthermore, major depression, suicidal thoughts, and suicidal behaviors were associated with significant, reduced odds of seeking help according to the World Health Organization's survey of more than 13,000 undergraduates from eight countries (Ebert et al., 2019). Ultimately, the state of mental health among college students is dire, help seeking behaviors and access to services are strained, yet college students continue to experience significant stressors which are links to psychosocial, physiological, and academic declines.

Substantial Undergraduate Stressors

College presents many opportunities for young adults and at the same time, entrance into adulthood and navigating college can present a clustering of stressors (Burt & Paysnick, 2012). Relationship status, residence, work status, school environment, and proximal social supports shift drastically for young adults who attend university (Arnett, 2000; Arnett & Hughes, 2014;

Kerig et al., 2011). Furthermore, research suggests that the social-emotional skills required to navigate early adulthood changes and the transition to college, are different than what development demands of middle or high schoolers (Conley, 2007). Consequently, college students may experience numerous stressors, and may not necessarily have the tools to cope with them quite yet (Conley, 2007).

Relationships

In a meta-analysis of 40 qualitative studies published between 2000 to 2012 evaluating college student stressors experienced as part of the transition from high school to college, research revealed relationship stress – which included romantic, faculty, peer, and family relationships –as the most prevalent theme across the data (Hurst et al., 2013). Students endorsed family stressors related to issues of homesickness and pressures to either perform well academically or to provide for their family in the form of money or childcare (Hurst et al., 2013). Romantic relationship concerns ranged from navigating challenging dynamics to break ups, while faculty and peer relationship stressors included concerns related to forging new relationships, assertiveness, asking for things, and difficulties staying in touch with friends back home (Hurst et al., 2013).

Approximately 56% of undergraduates seeking on-campus counseling services reported significant family or specific relationship concerns, placing relationship difficulties as the second most prevalent presenting concern after internalizing issues (LeViness et al., 2019). Further, national survey data indicates that almost 20% of undergraduates seeking on-campus counseling report feelings of loneliness (LeViness et al., 2019), missing friends from home, and fears related to how to make new friends (Ishler, 2004).

Despite relationship concerns and feelings of loneliness, college students long for connection and belonging (Arnett, 2014), and interpersonal communication can be challenging to navigate. Approximately one third of students report that intimate relationships have been very difficult to handle (ACHA, 2019). Unfortunately, college students are particularly prone to conflict with romantic partners and specifically endorse making more negative interpretations of behavior, to feel angry, and to endorse revenge-related goals in response to conflict with romantic partners, compared to family and friend relationships (McDonald & Asher, 2013). Furthermore, students from interdependent cultures frequently endorse family-student conflict, with respect to incongruent institutions and family expectations (Kalibatseva et al., 2017; Park et al., 2010; Vasquez-Salgado et al., 2015).

It makes sense that many students in college may experience relationship difficulties because the capacity to adaptively regulate emotions is connected to relationship contentment (Marroquin, 2011). And, emotion regulation is negatively impacted by internalizing symptoms (Marroquin, 2011), which is the chief mental health concern of undergraduate populations (LeViness et al., 2019; Xiao et al., 2017). Adaptive emotion regulation is also predictive of more positive and fewer negative interactions (Marroquin, 2011). The combination of common internalizing problems and strained relationships, however, can have significant consequences on students' psychological health.

Diversity Related Issues

Undergraduates of color and of diverse student populations experience additional stressors (Clark & Mitchell, 2018; Goodwill et al., 2018; Greer et al., 2011; Hong, 2015; Hurst et al., 2013; Johnson et al., 2014; Kranke et al., 2013; Seelman et al., 2017; Williams, 2018; Woodford et al., 2014). While some research has supported that white students tend to meet

diagnostic criteria for depression and anxiety at a greater rate compared to students of color, Black students endorse greater levels of psychological distress and lower levels of subjective wellbeing (Williams, 2018). Students of color, and especially students of color attending a PWI report stressors related to a lack of diversity and understanding across multiple qualitative studies (Clark & Mitchell, 2018; Hurst et al., 2013; Watkins et al., 2007).

Minority Status Stress

Minority status stress, defined as stress related to being a minority student which may be caused by experiences like discrimination or microaggressions, is predictive of negative mental health symptomology among Black students (McClain et al., 2016), Latinx students (Arbona et al., 2018), Asian Americans (Cokley et al., 2017), and international students from Asia (Wei et al. 2008). Given the underrepresentation of students of color in universities, current political climate, and history of racism in the United States, it makes sense that students of color may experience tremendous stress related to belongingness, safety, and stereotype threat while pursuing their baccalaureate degree (Johnson et al., 2014; Steele, 1997; Yosso et al., 2009). What is more, students of color regularly experience microaggressions (Tinto, 2017). Microaggressions are defined as "brief, commonplace daily verbal, behavioral, or environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial slights and insults toward people of color." (Sue et al., 2007, p. 352). With regards to the increasingly diverse collegiate student population (Hussar et al., 2020), this means nearly half of enrolled students experience the weighty encumbrance of repeated, verbal assaults from faculty, teaching assistants, or peers. Microaggressions are serious, frequent attacks that have been found to significantly impact student mental health (Torres et al., 2010).

Ultimately, students who identify with a diverse or historically marginalized student group, may endure added pressures, feelings of isolation, and threats to their well-being. According to minority stress theory (Meyer, 2003; Meyer et al., 2008) and the discrimination health model of stress (Pascoe & Richman, 2009), stigmatization can result in stress, which if left unchecked, accrues over time, and may result in long-term detriments to psychological or physiological functioning.

Intersectional Considerations. Intersectionality Theory is a method of evaluating the confluence of multiple social identities and their relationship with one another, as it relates to an individual's social location and systems of power (Núñez, 2014). Intersectionality is a theoretical framework that is derived from feminist and critical race theories. Approaching academic research from this perspective enables scholars to address the distinctive meeting of lived experiences based on numerous social identities such as income, gender, race, ethnicity, education, etc. (Crenshaw, 1989). Unfortunately, current research on historically marginalized college students and within psychological intervention outcome studies most often overlook the very real confluence of multiple identities that shape a student's experience in college (McCormick-Huhn et al., 2019; Nguyen & Nguyen, 2018; Settles et al., 2020). At the same time, it is imperative to evaluate student experiences that recognize and reflect the intersectionality of identities in higher education and in mental health prevention (Settles et al., 2020). Intersectional Critical Quantitative Research (Covarrubias, 2011; Hernández, 2015; Stage & Wells, 2014), may provide a promising approach to further clarifying the unique risk and protective factors of undergraduates with respect to race, gender, and first-generation college student status (Covarrubias, 2011; Duran et al., 2020; Else-Quest & Hyde, 2016; Kilgo et al., 2019).

Ultimately, according to the ACHA, approximately one third of college students report that stress impacted their academic performance, as measured by dropping a class, receiving at incomplete, or experiencing a significant disruption in their research, thesis, or practicum work (ACHA, 2018). This is particularly significant given that the survey asked students to report their experience and perception of stress only within the past month (ACHA, 2018). We also know that stress is linked to increase mental health as stress affects students' appraisals processes and impacts effective coping behaviors.

Theoretical Models of Stress

The term stress has been studied in a multitude of disciplines and while generally understood, has inconsistently been defined (Epel et al., 2018; Harris, 2020; Kagan, 2016). A recent review of the vast hypotheses published in peer reviewed journals revealed more than 200 models and theories of stress (Harris, 2020). Heterogenous constructs and measurement methods may be a result of multifarious stress research investigating experiences across social, psychological, and physiological contexts (Epel et al., 2018). While each approach to studying stress varies, two principal traditions – biological and psychological - have informed a state model of disease, wherein the impact of stress fosters responses that may have negative and endured impacts on mental and physical health (Cohen et al., 2019).

The Biological Tradition

In 1936, Hans Selye introduced the General Adaption Syndrome model of stress. Selye (1936) conceptualized stress as a defense mechanism. If the stress was prolonged or severe, according to Selee (1936) it may result in sickness or death. Therefore, stress was initially perceived as a negative stimulus which always resulted in negative outcomes (Selye, 1956). Selye later proposed that stress may result in positive outcomes (e.g., eustress) due to the

individual's interpretation of their physiological response to the event (Selye, 1983). Nevertheless, stress was primarily conceptualized as a physical response in the body that activated the sympathetic nervous system.

Continued research on stress within the biological tradition led to the Biopsychosocial Model of Challenge and Threat (BPS) (Seery, 2013). The BPS model assumes a situation is deemed challenging when an individual believes that they have the ability or resources to meet the environmental demands. Challenge – versus threat - appraisals are connected to improved cognitive performance, effective problem-solving, and physiological responses that drive motivation and preparation (Blascovich et al., 1999; Blascovich, 2008; Kassam et al., 2009). Thus, a challenge is defined by having sufficient resources and experiencing lower environmental demands, while a threat is defined as having insufficient resources and high environment demands (Seery, 2013). Researchers posit that psychological activity (e.g. cognitive interpretation of stressors) impact biomarkers such as cardiovascular activity which impact the ensuing stress response (Blascovich et al., 2003).

One strength of this model is that human responses to stress can be measured experimentally while exposed to stress promoting tasks (Seery, 2013). Experimental research conducted to examine stress appraisals demonstrated how human interpretation of stressors significantly impacted biological functioning. Specifically, individuals assigned to a pre-test adaptive cognitive reappraisal condition before completing a challenging academic task, were encouraged to frame their physical arousal as the body adequately preparing and motivating their mind for the challenge. Compared to the control and stress as maladaptive condition, the stress as enhancing participants demonstrated effective cardiovascular functioning, decreased attentional bias for negative information, and more positive emotions (Jamieson et al., 2013; Jamieson et al.,

2016). This is significant because when physiological stress responses are observed, such as perspiration, increased heart rate, or an upset stomach, humans tend to appraise the situation as negative and label their emotion as anxiety, nervousness, or fear (Kassam et al., 2009). As a result, the negative attention bias adversely impacts their performance (Jamieson et al., 2013; Kassam et al., 2009).

A limitation of this theory, however, is that a situation is deemed challenging when the person perceives that they have the resources or ability to meet the environmental demands of the stressor, implying that stressors are challenging only when they can be met with the available coping resources (Crum et al., 2017; Uphill et al., 2019). Further, stressors, according to this model, must be encoded as a threat or challenge, whereas the literature supports that neural networks may be attuned to aversive and appealing cues simultaneously (Uphill et al., 2019) because the brain supports simultaneous processing of positive and negative information (Man et al., 2017). Further, there are times when it would be impossible to reduce the demands of the situation, such as an exam that must be completed, (Crum et al., 2017) and BPS theory does not account for how an imbalance between environmental demands and coping resources can positively promote psychosocial growth (Zayas & Shoda, 2015).

The Psychological Tradition

The Transactional Theory of Stress and Coping is the most notable stress model within the discipline of psychology (Robinson, 2018) and it accounts for how the individual responds to an event and how they cope (Harris, 2020; Kilby & Sherman, 2016). Lazarus & Folkman, as part of the Transactional Theory of Stress & Coping, posit that stress is a transaction between the individual and their environment (Lazarus, 1966; Folkman & Lazarus, 1984) and this pioneering model, although since updated and continuously researched, is widely accepted today (Jamieson

et al., 2018; Lazarus, 1999). Folkman & Lazarus (1984) claim stress occurs when the individual perceives that what the environment is demanding of them exceeds their capabilities or resources, like the BPS model of challenge and threat, and this is particularly true in circumstances that are meaningful. The Transaction Theory of Stress and Coping includes three subjective appraisal phases: first, the degree of the demand is determined (e.g., primary appraisal), and then the individual assesses if they have the resources necessary to meet the demand (e.g., secondary appraisal), and finally, the subject reevaluates current circumstances, capabilities, and resources (e.g., reappraisal) (Folkman, 2011; Folkman & Lazarus, 1984). Therefore, an individuals' subjective interpretation influences the emotions that follow in addition to the physiological stress response if the individual determines the environmental demands to exceed their coping abilities or resources (Ben-Zur et al., 2019). The final component of the model is coping which signifies the individual's attempts to manage the demands that are straining their resources (Folkman & Lazarus, 1984). Coping is characterized as problem-focused or emotion-focused (Folkman & Lazarus, 1984).

One key contribution of the Transactional Theory of Stress and Coping model is the development of coping schemes, that have since spawned significant research regarding adaptive and maladaptive coping behaviors (Ben-Zur et al., 2019; Skinner et al., 2003). Additionally, Lazarus and Folkman contributed a framework that recognizes individual cognition, thus accounting for individual differences in stress response activates and varied stress response magnitudes (Folkman & Lazarus,1984). Therefore, according to this framework, negative stress is not decided solely by biomarkers as indicated in biomedical models.

Although the Transaction Theory of Stress and Coping addresses differences between trauma and chronic stress, as well as various post-hoc stress coping practices, significantly less

research, comparatively, is devoted to individual stress attitudes (Folkman, 2011). Unfortunately, college students do not have the ability, necessarily, to eliminate stressors from their life as detailed previously in this chapter. Colloquial messaging denoting stress as a debilitating variable to be avoided or removed (Jamieson et al., 2016), therefore, may have an impact on a student's psychological health and elude opportunities to leverage stress as a constructive motivator.

The Stress Mindset Model

Very little research has been devoted to general attitudes about stress, yet stress attitudes present opportunities to optimize ongoing responses to challenging events (Crum et al., 2013; Jamieson et al., 2016). Stress Mindset Theory theorizes individual belief systems about stress can impact functioning and a stress-as-enhancing attitude may improve functioning (Crum et al., 2013). This is called a stress-is-enhancing mindset. Stress mindset research posits even stimuli encoded as "high environmental demand and low resource" could be viewed from a stress-as-enhancing perspective to change the ensuing physiological and psychological responses outlined in the Biopsychosocial Model of Challenge and Threat (Blascovich, 2008).

What makes stress mindset theory particularly unique is that the theory questions the compulsory "ingredients" required to thrive and asserts that even if an individual is particularly opposed by the situation and has few resources, an adaptive mindset may sufficiently reduce negative physiological and psychological responses to high environmental demands (Crum et al., 2017; Crum et al., 2013). For example, the relationship between adverse life events and psychological symptomology among students with a stress-as-enhancing mindset was significantly reduced compared to students who endorsed a stress-as-debilitating mindset (Park et al., 2018). Among first year undergraduates, adoption of a stress-is-enhancing mindset

predicted higher levels of positive mood (Goyer et al., 2018) and promoted more adaptive appraisals (e.g., “this is a challenging” versus “I can’t do this”) of puzzling math tasks (Kilby & Sherman, 2016).

Stress Mindset Theory may be beneficial from the position of intervention and education, as collegians may experience numerous stressors that they do not have the agency to change within the foreseeable future, such as systemic institutional issues, anticipation of an exam, financial constraints, or ongoing roommate conflict. Developing research suggests stress-as-enhancing mindsets may thwart activation of stereotype threat (Jamieson et al., 2016) which otherwise negatively impacts minority groups (Steele, 1997). Moreover, college student reports of stress mindset, perceived stress, and symptoms related to anxiety and depression support a stress-is-enhancing mindset can mitigate the positive relationship between perceived stress and internalizing symptoms (Huebschmann & Sheets, 2020). Ultimately, stress-is-enhancing mindset research compliments the interdisciplinary and large body of research on stress, as it points to another channel for intervention.

Applicability of Stress Mindset Theory Among Historically Disadvantaged Populations

Presently, review of the literature between 2000 and 2022 suggests that no research has been conducted to evaluate the applicability of overall attitudes about stress maintained within historically marginalized populations. A push to perceive stress as “enhancing,” in the broader context of systemic racism and social justice, may be invalidating and reinforcing of systemic issues that uphold racism and forward the narrative that therapy is for white folks (Ahsan, 2020). Camagian & Cariaga (2019) asserts that in social emotional learning (SEL) teaching, lack of attention paid to individual identities and race further reinforces systems of oppression. As a result, color-evasiveness, or refusal to acknowledge race (Camagian & Cariaga, 2019) within the

context of sociopolitical education or within the field of psychology, results in damaging instruction. Thus, future research must decolonize understandings of "well-being" and social emotional learning curricula in order to ethically serve all students. Detailed participant demographic and racial data is not disclosed in present literature evaluating stress mindset.

Exploration of stress theories is relevant to this investigation of attenuating this undergraduate mental health crisis. If attitudes about stress can operate as buffering factors, and students can also learn more effective cognitive appraisals or behavioral responses to specific stressful events, symptoms of anxiety and depression could decrease

A Public Health Prevention Model

Schools present themselves as an ideal environment for tiered, mental health supports (Kilgus et al., 2015). Evaluating the strengths of a MTSS service model for mental health services in higher education, as well as the key implementation barriers, may push policy makers, researchers, school administrators, school psychologists and other teams to work together and to mobilize decision-makers to address this pressing issue. Currently, MTSS service models are supported by research in kindergarten through 12th grade settings, and an MTSS preventive mental health model has yet to be explored within the higher education context. While it is important to address student mental health concerns from a social ecological model to support lasting, sustainable change (Bronfenbrenner, 1977), review of the literature supports that individual and institutional supports are necessary (Golden & Earp, 2012).

More than twenty years ago, the Surgeon General asserted that mental health must be included as part of the public health model of disease and illness prevention (U.S. Department of Health and Human Services, 2000). A public health model focuses on the promotion of positive mental health, prevention of mental illness, and treatment of mental illness symptoms for all

individuals (Brown-Chidsey & Bickford, 2015) rather than remediation for clinically symptomatic individuals. Applied to school systems, the public health model has been translated to what is known as multi-tiered systems of support (MTSS). The MTSS framework is an acceptable model for delivering mental health supports due to its focus on prevention, matching service level with the intensity of student's needs, and screening measures to identify at-risk individuals (Collins et al., 2019; Kilgus et al., 2015). Traditionally, there are three tiered systems of support: primary prevention or universal services; secondary targeted services, and tertiary intensive individual services (McIntosh & Goodman, 2016).

Tier-I Promotion and Prevention

The foundation of a public health model or first tier of MTSS approach to mental health, is designed to promote students' wellbeing and prevent mental illness (Brown-Chidsey & Bickford, 2015; Cook et al., 2015; National Association of School Psychologists [NASP], 2015). Examples of tier-one services may include preventive social-emotional learning curricula to bolster student skills and universal mental wellness promotive services. The theory behind universal programming is to equip students with skills and bolster effective behaviors to prevent mental illness from developing in the first place (Kilgus et al., 2015). When a MTSS system is implemented with fidelity, approximately 80% of individuals benefit from universal programming and do not require more indicated levels of service (McIntosh & Goodman, 2016).

Tier-II Support

The second level of public health model or MTSS approach to school-based mental health services approximately 15% of students who require more targeted intervention (McIntosh & Goodman, 2016). Tier-two interventions may look like peer-mentoring or group-based interventions specific to the presenting problem. A key feature of tier-two interventions is that

students do not need to present with clinically significant symptomology in order to receive services (Kilgus et al., 2015).

Tier-III Services

Lastly, the third level of an MTSS approach to school-based mental health services is for indicated students who require individual services specific to their clinically significant mental health needs (Cook et al., 2015). The research supports that when an MTSS model is implemented with fidelity, that only approximately 5% of students will require tertiary care (McIntosh & Goodman, 2016). Because this third tier of intervention is the most individualized, it is associated with greater implementation and maintenance costs (NASP, 2015). Thus, implementing preventive programs at the universal level may save institutions significant money (Greenberg et al., 2017; U.S. Department of Health and Human Services, 2000). Further, school-based mental services implemented within the context of an MTSS framework are particularly effective for students with internalizing behaviors because internalizing issues are more likely to go undetected by others compared to students with externalizing concerns, thus missing key opportunities to intervene (Collins et al., 2019; Weissberg et al., 2015).

Barriers Related to a MTSS Higher Education Model

Implementation of an MTSS framework, however, is not without its challenges (McIntosh et al., 2014; Parcover et al., 2015). The current research on MTSS implementation, largely in kindergarten through 12th grade settings, suggests that limited resources and buy-in are the most significant barriers prevention adoption of an MTSS framework for school-based mental health (Dowdy et al., 2010; McIntosh et al., 2014). Given the significant lack of research related to a MTSS framework for mental health services in college, however, universities also lack comprehensive programming and shared initiatives as well.

Limited Resources

In a qualitative analysis of school staff perceptions of barriers to multi-tiered school-based mental health service delivery in 217 schools in 14 states, limited resources were reported as the most significant barrier to sustaining the school-based mental health program (McIntosh et al., 2014). Limited resources are defined as restricted funding and time (McIntosh et al., 2014). The school staff who were interviewed reported that once funding dried up, programs were unsustainable. Participants listed the absence of new funding to keep initiatives going and the limited time available for one school representative to continue implementation efforts of an entire research team once they left as primary funding related issues (McIntosh et al., 2014). Pinkelman and colleagues (2015) replicated these studies and found similar results.

Restricted Programming

Another barrier related to an MTSS model for mental health prevention in higher education is the dearth of comprehensive social-emotional learning programs that target the leading issues college students endorse (e.g., internalizing symptoms, relationship issues, and suicidal and self-harming behaviors) (ACHA, 2019; Conley et al., 2015). Instead, preexisting evidence-based interventions available, tackle singular issues (Blueprints for Healthy Youth Development, 2020), which is problematic (Reinke et al., 2012). Scholars posit, “singular interventions typically have modest effects, possibly because targeting only one risk factor may be insufficient for reducing problems given that most problems are rooted in a multitude of risk factors” (Reinke et al., 2012, p.158). Thus, multi-tiered services must address various underlying issues and universal programming must reach a broad range of common student concerns (Reinke et al., 2012).

Siloed Initiatives

Related to incohesive programming, it is not uncommon across large university settings and multiple colleges housed under one university to yield siloed, though related, varying initiatives within the higher education context (Cox & Naylor, 2018; Parcover et al., 2015). In a qualitative review of lessons learned while instituting a public health approach to counseling services at a large institution on the east coast, Parcover and colleagues asserted relationship development and maintenance with other departments and student organizations as critical mechanisms of change. The literature highlights the necessity of a unified approach to prevention (Cox & Naylor, 2018; Parcover et al., 2015).

Administrator Buy-In

In addition to insufficient resources, school personnel also listed administrator buy-in and perceptions of competing responsibilities as a key determinant of multi-tiered, school-based mental health success (Langley et al., 2010; Pinkelman et al., 2015). Achieving buy-in may be difficult if mental health services are seen as competing with academic preparation and if staff are incredulous to the bidirectional relationship between mental-health and academic performance (Pinkelman et al., 2015). Open-ended interviews of mental health MTSS program initiators, for example, reported that if school administrators decide an intervention was futile, MTSS programs do not get off the ground and fail in less than five years (Langley et al., 2010).

Infrastructure and Models

Due to the dearth of research and action related to a MTSS framework for mental health services in the higher education setting, a notable barrier is the lack of model for other universities to reference (Brown-Chidsey & Bickford, 2015). For example, according to Mental Health America's (MHA) recent position statement on college and university responses to

mental health crises, recommendations were focused on tertiary services (MHA, 2019). Specifically, one of twelve recommendations included preventive measures (MHA, 2019). At the same time, public health approaches to preventing disease and illness is a common place approach to supporting human well-being (CDC, 2018). Relatedly, infrastructure related to intervention fidelity and implementation protocols are cited as central barriers inhibiting effective mental health service delivery within a public health framework (Reinke et al., 2012). Thus, the lack of what an MTSS service delivery model may look like within the higher education setting, coupled with limited resources, a deficiency of comprehensive social-emotional learning programs designed for college-age students, siloed campus initiatives, and buy-in, all pose a serious threat to effectively reducing and preventing student mental health issues.

Strengths Related to a MTSS Higher Education Model

Given that tiered service delivery models have been indicated as the gold standard for systemic prevention of and efficacious treatment for learning difficulties, mental health issues, disease, and illness, there are several strengths associated with this model (NASP, 2015). Key strengths include the preventive nature, ecological sensitivity, cost-effectiveness, and academic payoff or benefits.

Preventive Nature

Perhaps the most remarkable feature of a MTSS service delivery model is that it is preventive versus reactive. This model boosts early identification proficiencies. Dated models of service operate on a “waiting to fail” ideology whereby students who meet clinically significant diagnostic criteria and present substantial, impaired functioning are the few who receive mental health services (Dowdy et al., 2010). Dowdy and colleagues (2010) argue that this antiquated

method has failed to decrease rates of mental illness in students, particularly because students are not identified until their symptoms are well developed. Recent economic research on counseling spending in higher education settings supports that centers who devote budget spending to hiring counselors for individual and small group counseling at the indicated (Tier III) level see "just more students who want services" and "fail to shorten waiting lists" (Novotney, 2014, p. 35). Alternatively, when a collegiate counseling center redirected funds towards developing and implementing a preventive phone app for students with mild anxiety symptoms, skill-based mini video lessons, and text reminders, the center reported significant, increased numbers of students served and remarkable reductions in anxiety symptoms and shorter waitlists for students with critical needs (Novotney, 2014).

Ecological Sensitivity

In a meta-analysis of adolescents' help-seeking behaviors and barriers to receiving services, results indicate that transportation, stigma, and poor mental health literacy were substantial barriers to receiving mental health support (Gulliver et al., 2010). Gulliver and colleagues' research also showed significant improvements in help-seeking behaviors when tiered, school-based mental health services are provided, thus further substantiating the efficacy and acceptability of an MTSS delivery model (Gulliver et al., 2010). Reasons for delaying or abstaining from seeking help include misinformation regarding mental health (Johnson & Coles, 2013), financial barriers, lack of time (Hunt & Eisenberg, 2010; Downs & Eisenberg, 2012), and perceived stigma (Downs & Eisenberg, 2012). Furthermore, results from a state-wide survey of California public institution undergraduates showed that students with active coping skills and those who endorsed their campus to be supportive of mental health in general, were more likely to use individual mental health services when needed (Sontag-Padilla et al., 2016). This suggests

that school-wide efforts to support student mental health and teach active coping skills may promote effective help-seeking if or when indicated levels of symptomology arise.

Unsurprisingly, researchers have also found that the delivery of intervention services in the very setting in which the problem exists provides children and adolescents maximum opportunities to generalize treatment gains (Gulliver et al., 2010; Michie et al., 2015). Implementation of an MTSS model for mental health within a higher education setting also enhances equitable access to mental health services across a broader continuum of care for students who may not otherwise be able to access care (Villancourt et al., 2013). Overall, the research demonstrates that a school's reach is unparalleled, citing services provided in a school (compared to off-campus community settings) as more ideal spaces for both access to and acceptance of prevention and intervention services (Gulliver et al., 2010; NASP, 2015; Paternite, 2005).

Cost-Effectiveness

Anxiety and depression issues among young people cost the United States more than 210 billion dollars per year (Bruffaerts et al., 2018). Despite the development of additional programs, implementing an MTSS service delivery model for mental health is cost-effective because, if implemented to fidelity, students only receive the level, frequency, and intensity of services that they need (August et al., 2018) which ultimately saves organizations money that would otherwise be spent on costly individualized or intensive care for a larger number of students (O'Connell et al., 2009). Failure to provide preventive services as part of a tiered model can result in worsening student symptoms, (LeViness et al., 2019) which may result in increased student dropout rates, or worse, suicide rates (Mortier et al., 2018). Research conducted by the American Council on Education supports universities who invest in preventive mental health

programming benefit from increased academic performance, retention, and tuition revenues in addition to improved student mental health and post-graduation income (Lipson et al., 2019a).

Academic Payoff

While some schools may argue that their responsibility is to provide academic instruction, research demonstrates that academic and mental health competencies are interrelated (Esch et al., 2014; McLeod et al., 2012; Suldo et al., 2008). In fact, this relationship is bidirectional (Suldo et al., 2014) and may even have cascading effects (Burt & Roisman, 2010; Masten et al., 2005; Masten & Cicchetti, 2010; Moilanen et al., 2010). Research assessing adolescents' self-report measures of subjective well-being and symptoms of psychopathology found that students with lower rates of symptoms of psychopathology and higher rates of subjective well-being were correlated to higher reading scores, academic goals, and school attendance (Suldo et al., 2008). A tiered school-based mental model has been linked to improvements in student mental health as well as academic performance (Cook et al., 2015) and high education settings who provide preventive services as well as a continuum of care are associated with higher rates of academic persistence (Eisenberg et al., 2009).

Social Emotional Learning Program Considerations

Social emotional learning programs are appealing. At the same time, there is a dearth of programming specific to higher education populations. It is imperative to evaluate the theoretical assumptions of Social Emotional Learning (SEL) programming and its impact on historically marginalized racial and ethnic communities.

Paucity of Emerging Adult SEL Programs

While there is a plethora of research devoted to social emotional learning (SEL) curricula in primary and secondary schools (Durlak et al., 2011; Taylor et al., 2017), very little research

has been devoted to SEL programs in higher education (Conley, 2013). The Collaborative for Academic, Social, and Emotional Learning (CASEL), is an institution committed to researching and supporting effective implementation of evidence based SEL curricula as part of their mission to educate the whole child. Review for their SEL program guide indicates that there are no evidence-based curricula and established programs for students in higher education settings that meet the necessary inclusion criteria (Weissberg et al., 2015). Inclusion criteria include at least one carefully conducted evaluation that includes a control comparison group, pre and post intervention measurements and significant main effects (Weissberg et al., 2015).

Relatedly, search results obtained through the University of Colorado Boulder's Blueprints for Healthy Youth Development program guide yielded two programs for college students that are substantiated by efficacy research findings, yet neither "Blue Prints Model" program (e.g. Brief Alcohol Screening and Intervention for College Students [BASICS] and Body Project), target undergraduate mental symptomology specifically through a skill-focused lens, nor may be appropriate for a universal college student population to prevent mental health issues (Blueprints for Healthy Youth Development, 2020; Mihalic & Elliott, 2015). Programs that received a "promising" Blueprints rating, aimed to prevent substance use or violence, or targeted very specific populations such as foster care youth transitioning to college, individuals with diagnoses of social anxiety, or low-income students seeking post-secondary job skill training (Mihalic & Elliott, 2015). Consequently, while universities may serve as the testing ground for faculty's research initiatives related to mental illness prevention, there are no known, wide-spread, evidence-based preventive curricula that can be looked to in response to this undergraduate mental health crisis. Despite the paucity of research related to mental health prevention programs, there are some promising, skill-focused interventions piloted on college

campuses that pertain to mindfulness, relationship skills, and cognitive-behavioral coping skills as potential keys to prevent symptomology moving forward. Additional considerations include how collegiate SEL programming may be responsive to racial, ethnic, and other sociocultural differences in an authentic way that promotes student wellbeing in a manner that is culturally meaningful to them.

Social Emotional Learning Cultural Responsivity

The aim of SEL, according to (CASEL), is in part, to help disadvantaged groups to realize their fullest potential (Jagers et al., 2018). Yet, SEL programming has historically promoted dominant cultural norms of individualism, European American definitions of what it means to be well, and the Western specific ways by which "healing" and resilience can be achieved (Mahfouz & Anthony-Stevens, 2020). Student experiences among historically marginalized groups, unfortunately, are often viewed or perceived from a "deficit model", as indicated in Social Capital Theory, whereby students are perceived to lack skills that are only specific to the individualistic, affluent, and Euro-American centered institutions (Bourdieu, 1986; Yosso, 2005). Social Capital Theory can be problematic because it assumes that some students are culturally rich while others are culturally poor, and therefore they are inherently at a deficit. Yosso's seminal work on cultural community wealth through a critical race theory lens (2005) asserts, "as a result, schooling efforts usually aim to fill up supposedly passive students with forms of cultural knowledge deemed valuable by dominant society" (p. 75) and students' cultural strengths may be ignored. Importantly, equitable SEL programs are, arguably, those that foster sense of self among young persons, uphold students' cultural values, rewrites the narrative of "alternative" forms of coping or help-seeking as cornerstones to promoting the cultural wealth

(Yosso, 2005) and critical consciousness (Diemer et al., 2017; Garriott, 2020) of the students it aims to serve.

Promising Mental Health Interventions

There is a dearth of social emotional learning curricula. What is more, there is a lack of research pertaining to the ecological validity of universal level social emotional learning program across racial and ethnic groups within the higher education context. At the same time, mental health disorders in college are related to declines in academic performance (Bruffaerts et al., 2018), decreased undergraduate graduation rates (Hunt et al., 2010), relationship difficulties (Topor et al., 2016), labor market marginalization – as measured by sick leave due to mental illness and unemployment - (Niederkrotenthaler et al., 2014), persistent mental illness (Brimblecombe et al., 2017; Zivin et al., 2009), and physical health problems (NIMH, 2019; Scott et al., 2016). As a result, it is necessary to understand what are effective, culturally sensitive and responsive interventions that can be employed to promote student wellbeing and prevent symptomology in the first place. One hypothesis as to why internalizing issues, relationship difficulties, and subsequent self-harming and suicidal behaviors plague college students is the lack of adaptive skills to respond effectively to stressors (Beiter et al., 2015). Mindfulness-based, coping skill, and relationship skill interventions emerged in the literature as primary intervention directions.

Mindfulness-Based Interventions

According to Kabat-Zinn's seminal research on mindfulness-based interventions as a tool for reducing stress, mindfulness is "the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). Mindfulness-based interventions (MBIs) teach students

how to observe their thoughts and surroundings nonjudgmentally, to be in the present-moment, and to do what works for them, thus accepting and acknowledging what comes into their awareness (Kabat-Zinn et. al, 1985; Kabat-Zinn, 2003). The literature supports MBI's positive effects on students' psychological health (Keng et al., 2011) among non-clinical (Cavanagh et al., 2018) and clinical (Hofmann et al., 2010) populations. Support for MBIs are also reported with decreases in substance use (Single et al., 2019), a maladaptive behavior connected to coping with internalizing issues (Vohra et al., 2019; Zack et al., 2014).

In a randomized control trial comparing mindfulness-based interventions – one with a formal meditation practice and one without, and a waitlist control, for undergraduate students without clinically significant psychopathology, both MBI conditions supported significant decreases in perseverative thinking, as well as anxiety and depression symptoms (Cavanagh et al., 2018). One strength of this intervention is that it was delivered online for two weeks, suggesting high feasibility with regards to required resources. Another MBI evaluation suggests that students may require as little as three MBI in-person sessions, to decrease symptoms of depression and anxiety, with maintenance experienced 3 weeks post intervention (Parcover et al., 2018). Both interventions are cost effective with respect to interventionist's time and may be acceptable to students given the brief participation commitment. Due to high attrition rates in both randomized controlled trials, however, and absence of long-term follow-up assessment, it is unknown how impactful the intervention may be over time and the difference between students who dropped out and students who remained enrolled in the interventions.

The literature also supports that a 6-week mindfulness-based stress reduction (MBSR) intervention for non-clinical students and faculty significantly reduced psychological distress, compared to a waitlist control (Canby et al., 2015). Given the small sample size of the control (*N*

= 25) and treatment (N = 19) groups, respectively, and small effect size, however, it is unclear what the scalability of this intervention may be and the likelihood that similar effects exist within the population of university students (e.g. power).

Lastly, the *Learning to BREATHE* (LB2) program, a research-supported MBI developed, in part by Kabat-Zinn and colleagues (1985), was adapted and implemented for first-year undergraduate students residing on-campus. Completion of the intervention was associated with decreases in internalizing symptoms and increased student life satisfaction, whereas students in the waitlist control condition endorsed decline in mental health and life satisfaction (Dvořáková et al., 2017).

One limitation of this study, however, is that participation reasons were solely reliant on student motivation, as academic credits, for example, were not awarded for completion of the course (Dvořáková et al., 2017). Further consideration of behavior change techniques may bolster intervention acceptability when motivation levels are varied. Ultimately, MBI's may be a useful tool to reduce college student internalizing symptomology, however no studies were found that support MBI intervention among college students' coping abilities nor improved relationships. Therefore, in order to respond to the cluster of common mental health symptoms experienced by undergraduates, an effective social-emotional learning program may introduce students to a variety of tools.

Coping Skill Instruction

Findings from a meta-analysis on randomized controlled trails evaluating the impact of undergraduate mental illness prevention interventions suggest, collectively, that coping skill interventions may reduce symptoms of anxiety, depression, and stress, with sustained effects from seven to 18 months (Winzer et al., 2018). Further, these interventions may support

student's use of effective, active coping with a medium and significant effect size (Winzer et al., 2018). In an evaluation of institutional and individual predictors of student mental health problems, student coping abilities were supported as the strongest predictor of mental health (Byrd & Mckinney, 2012). These findings are significant, as they suggest that teaching students how to cope effectively is particularly crucial to preventing mental health issues (Bettis et al., 2017).

One example of a coping skill intervention is called the *Blues Program*. Multiple randomized control trials of this brief, 6-week, intervention for students with elevated, though not clinically significant, symptoms of depression, supports variable efficacy in reducing sub-clinical depression (Rohde et al., 2015; Rohde et al., 2016; Rohde et al., 2018; Stice et al., 2007). As part of the *Blues Program*, college students are taught cognitive restructuring and behavioral activation coping skills, two core techniques associated with cognitive behavioral therapy. Yet, the *Blues Program* has not consistently yielded greater gains when compared to the self-help book, *Feeling Good* (Burns, 1999) condition or among those who received depression-prevention brochures (Rohde et al., 2014). While there is no waitlist or business-as-usual control to compare across treatment group symptomology, these findings are significant, suggesting coping skill instruction alone may not suffice to promote significant mental wellness among college students (Rohde et al., 2014). Additional limitations of this study include a small sample resulting in limited power and low attendance rates which constrain interpretation and application of findings. Additionally, notable treatment gains due to coping skill intervention may not have been achieved due to the lack of skill coaching (Conley et al., 2015). An evaluation of 103 controlled coping skill interventions for students in higher education supports that interventions with skill use supervision (e.g., skill coaching) yields greater, overall mean effect

sizes compared to programs without skill coaching in reducing symptoms related to depression, anxiety, and overall psychological distress (Conley et al., 2015).

Lastly, one distinguished intervention that included coping skill coaching is an intervention that lasted the duration of an academic year and taught students skills related to mindfulness, emotional literacy and regulation, interpersonal communication, stress management, effective problem-solving, cognitive restructuring, and relaxation (Conley et al., 2013). While participation was voluntary, completion of the course was associated with greater adjustment in college and decreased ratings of stress (Conley et al., 2013). The research also supported that students who rehearsed the skills taught was related to improved student outcomes (Conley et al., 2013). Limitations of this study, however, include a small sample size (n = 51) and lack of follow up data to survey the presence, if any, of lasting intervention effects.

Relationship Skills

Despite relationship issues presenting as a top reason for seeking mental health services among college students (LeViness et al., 2019; Locke et al., 2016), review of the research published between 2010-2020 support very few relationship skill-related interventions to ameliorate this source of distress for students. One intervention that supported specific relationship skills, targeting social, informational, and instructional support seeking behaviors for first-general college students demonstrated that student intervention participation was associated with self-reported closer relationships with faculty and improved attitudes about school (Schwartz et al., 2018). The intervention was led by trained faculty and asked students to identify strong and weak ties within their respective support network, roleplay skills related to making requests, and complete mock interviews (Schwartz et al., 2018). The researchers provided opportunities to support students drawing from their own systems of support and enhanced their

preexisting resources and connections, yet due to the low ratio of professor to student numbers, this intervention presents significant scalability concerns.

When college students have been provided conflict resolution training as part of a freshman orientation seminar, findings from a randomized control trial support no statistically significant impact on students' follow up reports of conflict handling style nor satisfaction in relationships (Waithaka et al. 2015). Although the findings were insignificant, the duration of the intervention was two hours long and largely comprised of video modeling and no opportunities to practice (Waithaka et al., 2015). Thus, students may have benefitted from skill rehearsal, peer coaching, and feedback from an instructor, as well as more exposure to the intervention (e.g. increased intervention duration) which are evidence-based behavior change practices (Michie et al., 2015). These are findings are important because social support is associated with reducing stress among undergraduates (Leary et al., 2012) and students who have social support described as helpful and meaningful, report less loneliness, an easier transition into college (Mattanah et al., 2010), and greater academic achievement (Mattanah et al., 2012).

A Proposed MTSS Mental Health Program in Higher Education

It is undeniable that universities are uniquely situated to provide preventive mental health programming in response to the stressors and challenges associated with emerging adulthood because they have direct, frequent access to undergraduate students (Conley et al., 2015; Schiraldi et al., 1998). Universities may learn from the well-studied and supported kindergarten-12th grade MTSS preventive mental health and social emotional learning models.

A recent publication issued by the Center for Collegiate Mental Health (CCMH) indicated that counseling centers must partner within their institutions to support a range of comprehensive clinical and promotive services (Locke et al., 2016), which further illustrates the

importance of instituting tiered mental health services in higher education that step beyond the perils of reactive models. Instead, this mental health crisis warrants universities to promote adaptive skills, prevent mental illness, and then as needed, respond to the few who require individual level of care. Greenberg and Abenavoli (2016) assert, "if one can shift the mean of the entire population, the percentage of persons requiring the high-risk [intervention] will decline" (p. 8) which is exactly what a tier-I college level mental health course could deliver.

A Universal Level Foundation

Because mental health promotion and illness prevention through an MTSS framework relies on a solid tier-one foundation (Brown-Chidsey & Bickford, 2015) to promote wellness and prevent illness, it is imperative to first establish an effective universal level mental health program (McIntosh & Goodman, 2016). Establishment of a universal preventive mental health class would complement preexisting counseling therapy services and may offer reprieve to long waiting lists for tertiary care (Brunner et al., 2017).

Logistically, because the design of the universal mental health prevention is course-based, several stigmas concerning help-seeking behaviors would be mitigated, including social stigma (Cadigan & Lee, 2019; Gulliver et al., 2010), transportation (Downs & Eisenburg, 2012; Gulliver et al., 2010), cost (Cadigan & Lee, 2019), and lack of time (Hunt & Eisenburg, 2010). Students would register for the intervention just like they would for another class, receive course credit, and mental health prevention would be normalized, in part, through psychoeducation and ideally, campus-wide undergraduate requirements to complete the course. To mitigate issues related to siloed campus initiatives (Cox & Naylor, 2018; Parcover et al., 2015), academic advisors would be informed of and require or strongly recommend the course to all incoming

students. It is anticipated that the course may be an appropriate tier-one class that would effectively service 80% of the collegiate population who would not require additional services.

Secondary and Tertiary Care

When institutions do not implement a MTSS framework and lack an effective universal intervention that promotes student wellbeing, unaddressed risk factors may become exacerbated and students may become symptomatic (Cook et al., 2015). Consequently, students turn to resource-intensive Tier II and Tier III services, such as group and individual therapy and rapid access crisis services, because without a continuum of care (e.g., MTSS framework) these types of services may be the only option (Wesley, 2019). Furthermore, because many university settings still require a nominal fee or bill student insurance (Eisenberg et al., 2009; Wesley, 2019), this method also not does not equitably serve all students. Given these factors, this can result in underserved students (Cook et al., 2015) and overcrowded counseling centers (Parcover et al., 2018).

Alternatively, if the abovementioned Tier I class is effective and a MTSS framework is implemented with fidelity, approximately 80% of students will have their needs met through universal programming (McIntosh & Goodman, 2016) and do not require more advanced care (August et al., 2018). As result, students who do seek higher level services, would be more likely to receive better quality and more in-depth services because counseling centers would experience a decrease in demand for services when preventive services are in place (O'Connell et al., 2009) and would be able to more effectively serve a volume of students that more appropriately matches tight operating budgets (ACHA, 2019).

An Upstream Prevention Package for the Higher Education Context

In response to preliminary research findings that support the efficacy of adapting evidence-based therapeutic interventions for sub-clinical populations (Cavanagh et al., 2018; Flynn et al., 2018; Parcover et al., 2018; Stice et al., 2007), the following upstream prevention package may be a suitable universal level foundation for undergraduate students to reduce internalizing symptoms. The proposed prevention package was developed by School Psychology faculty, namely Jim Mazza, Jaclyn Lally, and school psychology graduate students at the University of Washington. This intervention is aimed at all undergraduate students and is informed by the literature. It includes evidenced-based skills and content derived from Dialectical Behavioral Therapy (the principal treatment modality among suicidal clients and those with significant emotion regulation difficulties; Linehan, 1993), in addition to key practices drawn from Acceptance and Commitment Therapy (Hayes et al., 1999) and Positive Psychology (Seligman, 2007). Given the relationship between higher levels of interpersonal stress, increased internalizing symptoms, and low coping skill usage among undergraduates (Coiro et al., 2017), the proposed intervention package may effectively treat each of these common issues.

Dialectical Behavioral Therapy

A meta-analysis of interventions for internalizing problems among university students supports cognitive behavioral therapy and mindfulness-based interventions are effective for depression and generalized anxiety disorder (Huang et al., 2018). Specific skill instruction pertaining to mindfulness, coping, or relationship skills also have been associated with increased undergraduate wellbeing (Conley, 2015). One third-wave cognitive behavioral modalities, Dialectical Behavioral Therapy incorporates mindfulness-based interventions, offers specific coping and relationship strategies, and is grounded in CBT principals.

Among college students presenting with clinically significant psychological presentations such as depression, borderline personality disorder and/or suicidal behaviors, the DBT therapeutic modality has been shown to be highly effective among this young adult student population in a four-year university setting in decreasing internalizing symptoms, number of non-suicidal self-injury events, and social adjustment (Muhomba et al. 2017; Pistorello et al., 2012). While DBT was originally developed specifically for patients with borderline personality disorder and suicidal behaviors, this treatment modality has been supported among a variety of symptom clusters (Panepinto et al., 2015). For example, a short-term, 10-week intervention implemented through a college counseling center at a large 4-year university campus supported significant improvements in students' emotion regulation and functional coping (Muhomba et al., 2017). Teaching students DBT skills alone, compared to the comprehensive DBT treatment model which includes individual therapy and phone skill coaching, is also associated with decreased rates of hospitalizations due to substance use and psychiatric necessity (Chugani et al., 2013; Meaney-Tavares & Hasking, 2013). These findings suggest that DBT skills alone may contribute to a reduction in psychological symptomology. Furthermore, the implementation of DBT Skills alone (versus DBT Skills plus individual therapy), has been linked to decreases in unsafe behaviors, suicidality, and anxiety among clinical populations (Valentine et al., 2015).

DBT and Sub-Clinical Populations

More recently, DBT therapy approaches, particularly DBT skills, have shown positive results as a promising prevention model among sub-clinical adolescent and young adult student populations (Üstündağ-Budak et al., 2019; Fleming et al., 2015; Lee & Mason, 2019). For example, when DBT skills were taught to 14–16-year-old adolescents in a school-based setting in the general population, students who received the DBT skills curriculum presented significant

decreases in internalizing problems ($p = 0.01$, $d = 0.83$) compared to the waitlist control (Flynn et al., 2018). When a 9-week DBT skills training intervention was delivered to 80 middle-school aged youth in the general education setting with subclinical symptomology, Zapolski & Smith (2017) also observed significant decreases in youth's likelihood to engage in risky behaviors.

Cultural Considerations and DBT

Dialectical behavior therapy skills also have been utilized across cultural and racial contexts, suggesting this approach to bolstering individuals' wellbeing may be salient across sociocultural contexts. For example, Ramaiya and colleagues (2018) found Nepali women with histories of suicidality demonstrated improved emotion regulation and behaviors associated with resilience, following completion of a DBT skills 10-session intervention. There is also growing evidence that DBT skills interventions have been significantly effective among Korean clinical and subclinical populations (Choi, 2018), Chinese international students living in the United States (Cheng & Merrick, 2017), and Latino populations (Mercado & Hinojosa, 2017). An example of the cultural adaptations that were supported include tailoring psychoeducation and skill rehearsal of interpersonal effectiveness skills in a way that honors cultural values of harmony and respect to authority consistent in many Asian cultures (Cheng & Merrick, 2017). Similarly, skill instruction that incorporated Latino values of familismo, respecto, and marianismo yielded positive results (Mercado & Hinojosa, 2017). These adjustments are very consistent with American Psychological Association's ethical guidelines of practice which promotes "integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences" (APA, 2002, p. 57). The use of DBT skills training also has been effective when paired with American Indian/Alaska Native (AI/AN) specific healing traditions and traditional practices among AI/AN youth (Beckstead et al., 2015;

Kohrt et al., 2017). This data suggests that actively providing space for student or client integration of culturally relevant values and personalization of content is essential to positive outcomes among diverse student populations and that this can be successfully achieved within the framework of DBT principles.

Acceptance and Commitment Therapy

Acceptance and Commitment Therapy (ACT) also has been shown to contribute towards decreased internalizing issues while targeting improved psychological flexibility (Hayes et al., 2012). Furthermore, ACT linked to increased sociocultural responsiveness due to its theoretical assumption that therapy targets are not syndromal in its entirety. Hayes, the original author of ACT posits the approach is "more applicable to human beings in general" (p. 978). In this way, ACT views individuals holistically, and as a core tenet of the therapeutic modality, assumes that clients already hold wisdom and skills to move closer to their goals. From this perspective, individuals' core values are used to support committed action, acceptance, self-awareness, and cognitive diffusion as tools to bolster psychological flexibility (Hayes et al., 2012). Presently, ACT is recognized by the APA as an evidence-based treatment of depression, anxiety, and by the Substance Abuse and Mental Health Services Administration (APA, 2017).

ACT and Sub-Clinical Populations

ACT's research base among individuals with subclinical levels of symptomology is growing. College students 18 years of age or older who identified as experiencing some form of distress participated in a 4-week web-based self-help intervention adapted from ACT empirically validated protocols. While the majority of participants presented with mildly elevated scores on at least one symptom subscale, as measured by the Counseling Center Assessment of Psychological Symptoms, completion of the brief ACT intervention yielded significant decreases

in overall distress ($p = 0.01$, Cohen's $d = 0.66$) in addition to reductions in self-reported measures of social anxiety, academic concern, and social well-being (Levin et al., 2017). Further, Canadian university students who completed four, 2.5-hour ACT workshops and related homework, demonstrated significant increased psychological flexibility, well-being, and school engagement in addition to decreased self-reports of stress, anxiety, and depression (Grégoire et al., 2018).

ACT Values and Historically Marginalized Populations

ACT has been found highly acceptable and effective among Muslim populations (Tanhan, 2019). And ACT activities such as values clarification exercises may have far reaching utility among a variety of student groups. For example, FGCS who articulated how their long-term career aspirations are connected to their family or community goals, such as how they will help their parents or siblings or in what way they will give back to their social group, are more likely to persist in college when compared to FGCS who did not identify their goals (Azmitia et al., 2018). Among Latinx students, connecting family support to earning potential associated with a bachelor's degree is related to persistence (O'Neal et al., 2016). Values identification may give students a "strong sense of purpose" at the university, thus propelling them to persist (Hébert, 2018, p. 96). Lastly, brief values affirmation exercises facilitated by instructors may support significant increases in diverse students' GPA and retention in STEM fields (Harackiewicz et al., 2014). Hayes posits, "the usefulness of different ways of relating to experiences is emphasized [in ACT]. Utility is measured against the clients' own values, and values are viewed as choices the client makes, not judgments" and "values may differ from culture to culture, but the idea of therapy serving the client values in the client's social context does not" (Hayes et al., 2021, p. 992). If educators are able to promote or enhance student

reflection of values and goals, then it is hypothesized that a diverse student body may benefit from this intervention.

Positive Psychology

Lastly, positive psychology interventions focus on fostering more positive cognitions and emotions (Keyes et al., 2012; Seligman, 2007; Seligman & Csikszentmihalyi, 2014) rather than solely focusing on reducing illness (Seligman, 2019). A meta-analysis evaluating 39 studies, totaling 6,139 participants suggest positive psychology interventions (PPIs) can enhance psychological well-being and reduce internalizing symptoms (Bolier et al., 2013). While initially criticized for an overemphasis on the cultivation of happiness, its "Whiteness" in nature (Vaughan & Rodriquez, 2014), erasure of racism, sexism, and poverty within the theoretical underpinnings of this modality (Yakushko, 2018), second wave positive psychology assumes a dialectic whereby leveraging community and individual students' strengths, promoting resilience while also attending to the challenging experiences, behaviors, and emotions of being human can be an effective method to increasing individuals' wellbeing (Lopez et al., 2018; Sandage et al., 2003; Utsey et al., 2008; Wong & Roy, 2018). While not yet rigorously, empirically supported, this suggests positive psychology interventions may work best in tandem with other therapeutic interventions or modalities (Bolier et al., 2013). Examples of positive psychology key principles include character and family strengths, hope, forgiveness, gratitude, satisficing, posttraumatic growth, positive relationships, and savoring (Seligman, 2019). Positive psychology interventions have been found useful among clinical and subclinical populations and emerging research suggests that it may be acceptable and beneficial among diverse student groups too.

Positive Psychology and Clinical Populations

Review of the literature on PPI used among patients with severe mental illness (ex. Schizophrenia, bipolar disorder, and personality disorders) suggest there is a place for positive psychology interventions. A meta-analysis of 16 studies, totaling 729 patients, supports PPIs significant impact on patients with severe mental illness, specifically yielding large effects on measures of psychopathology and moderate effects on well-being (Geerling et al., 2020). Brief, positive psychology gratitude and personal strength exercises completed by hospitalized adults presenting with suicidal ideation and/or suicidal behaviors yielded medium to strong effect sizes on increasing optimism and decreasing hopelessness (Huffman et al., 2014). Further, a meta-analysis of evaluating efficacy of 30 published and peer reviewed positive psychology interventions in clinical settings support significant, though small effect sizes for improved patient reported well-being and decreases in depressive symptoms, and moderate improvements in anxiety (Chakhssi et al., 2018). On the other hand, one randomized control trial evaluating young adults diagnosed with 1 12-month depressive or anxiety disorder and the effect of positive mental health interventions on psychological wellbeing yielded promising, and significant effects among patients with anxiety disorders, while recovery from a depression disorder was not predicted by well-being nor positive mental health after controlling for psychotropic medication, comorbid disorders, acuity of symptoms (Schotanus-Dijkstra et al., 2019). A common theme across literature, however, is that PPIs alone may not be a sufficient intervention for individuals with clinically significant mental health issues, particularly depression, and clinical populations may benefit from PPIs when paired with other evidence-based interventions (Marrero et al., 2016).

Positive Psychology and Subclinical Populations

Completion of a brief gratitude intervention (Seligman et al., 2005) among those on a waiting list for psychotherapy at an outpatient, community-based clinic who had endorsed moderate degree of depression, anxiety, and stress symptoms as measured by the Depression Anxiety and Stress Scale – Short Form (DASS-21) and clinically significant levels of impairment as measured by the Outcome Questionnaire (OQ-45) demonstrated significant increases in psychological functioning and decreases in depressive symptoms compared to the control group (Cohen's $d = 1.23$) (Kerr et al., 2015). In college student populations, students who wrote about "my best possible self" endorsed increased well-being (King, 2001) which has been replicated in at least 34 randomized controlled trials, yielding small to medium effects on positive affect and optimism, though affects were strongest among studies that assessed students affect immediately following the intervention (Heekerens & Eid, 2020). College students who reflected on positive experiences as part of a gratitude journal for three days reported elevated moods and frequented their campus health center less at 3 month follow up compared to students who write about their burdens (Emmonse & McCullough, 2003) and similar findings were obtained in a randomized control trial whereby undergraduates completed a gratitude writing intervention and positive effects in improved mental wellbeing were maintained at 6-month follow up (Bohlmeijer et al., 2020). Further, meta-analyses indicate utilization of multiple positive psychology interventions, rather than just one, yields greater wellbeing gains, thus support a dose-response relationship (Schrank et al., 2014).

Positive Psychology and Cultural Considerations

There is emerging evidence to support positive PPIs may be acceptable and effective among diverse student groups. For example, Utsey and colleagues evaluated 215 African

American undergraduates at a large public 4-year university and examine the relationship between African American college students' cultural orientation, religiosity, and racial pride as it relates to psychological functioning and well-being. African American college students' endorsements of a cultural orientation that is consistent with African American culture in the United States, religiosity, and racial pride positively predicted psychological functioning and well-being (Utsey et al., 2008). Similar findings were corroborated by Ajibade and colleagues (2016) whereby racial/ethnic identity was positively associated with life satisfaction. Consequently, providers and social emotional learning instructors can aim to promote self-authorship as it relates to cultural and racial identity as well as character strengths (Utsey et al., 2008), consider how religiosity may serve as a source of optimism and hope for this student group (Shafranske, 2005; Utsey et al., 2008), and utilize psychoeducational materials that African American students can see themselves reflected in. A study evaluating a positive psychology intervention package administered to a culturally diverse college student group yielded positive effects of students' ratings of wellbeing, as measured by the Scale of Positive and Negative Experience and the Flourishing Scale, at post-intervention and three months follow up, suggesting PPIs may be culturally relevant across student groups (Lambert et al., 2019). In Lambert and colleague's research, 39 nationalities were represented, while Nigerian, Emirati, and Indian nationalities were the largest student groups, 77% of students identified as Muslim, and 94% of the students identified as international students. Specific PPIs conducted included the following: writing a gratitude letter, mindfulness, service to others, and savoring. These same PPIs are promoted in this study's intervention.

Evidence-Based Behavior Change Techniques

According to evidence-based guidance issued by the National Institute for Health, core behavior change principles include delivering an intervention using content that is evidenced based, individual level interventions, social relationships as a facilitator, rigorous monitoring, and evaluation (Abraham & Michie, 2008). Furthermore, meta-analyses of efficacy of behavior change techniques when used by health care professionals identified that self-monitoring and social support were the most effective behavior change strategies utilized across 23 randomized control trials, whereas providing information and materials alone was found to be insufficient (Van Achterberg et al., 2011). Additional, well-supported behavior change techniques (BCTs) include goal setting and self-monitoring of behavior (Michie et al., 2015). In this same report, Michie and colleagues evaluated 93 common behavior change techniques reflected in applied intervention research across several countries. Future research aims should clearly document BCTs employed and thoughtfully integrate BCTs to enhance intervention efficacy when asking students to adopt new skills as habits moving forward.

Purpose of Proposed Study & Research Questions

In sum, there is a dearth of information in existing literature regarding preventive mental health interventions, evidenced-based curricula, compounded by no frameworks that higher education institutions can look to as road maps in response to this mental health crisis, despite foundational similarities in common evidence-based multi-tiered systems of support models and curricula in primary and secondary education settings. While the challenges of the current mental health treatment model in the higher education context is well-defined, more information is needed as to how universities may take an up-stream approach to mitigating the development of mental health issues requiring individual therapeutic services.

The purpose of this study was to investigate anxiety and depression outcomes associated with a preventive mental health course for college students. During the 10-week intervention, students enrolled in the University of Washington's EDUC 215 completed lessons and activities centered around seven core areas of practice: the science of resilience, a stressor framework, values identification and goal setting, core mindfulness, distress tolerance, emotion regulation, cognitive restructuring, interpersonal effectiveness, gratitude, and cultivation of positive emotions. Course content is derived from three evidence-based therapeutic modalities: Dialectical Behavioral Therapy (Linehan, 1993; Linehan, 2014), Acceptance and Commitment Therapy (Hayes et al. 1999; Hayes et al., 2012) and Positive Psychology (Seligman, 2007). This study examined the predictive value of students' pre-intervention self-reports of symptoms of anxiety, depression, and attitudes about stress on anxiety and depression change and the potential impacts of student demographic factors on this relationship.

Additionally, due to psychologists' historical failure to represent the multidimensionality and impact of systemic disadvantage and advantage on a participant's access to power and individual wellbeing (McCormick-Huhn et al., 2019), the current study contributes to research shifts by considering participants' intersectional positions to inform statistical analyses choices and interpretation of research findings. In general, findings from this study may contribute the emerging body of research devoted to preventive mental health programming in higher education and more accurately represent the specific students who may benefit from a preventive mental health intervention through intentional, critical quantitative research methods.

The research study aimed to answer the following research questions:

Research Question #1

What is the relationship among pre-intervention variables (e.g., demographic factors in addition to anxiety, depression, and stress mindset ratings) and students' change in anxiety and depression?

It was hypothesized that there will be a modest, though significant negative correlations between change in internalizing symptoms and pre-intervention internalizing symptoms (e.g., anxiety and depression, respectively), due to the lower, though still concerning base rates of psychological symptomology reflected in the general population (Greenberg & Abenavoli, 2016). Modest correlations are predicted due to the high rates of students who report needing psychological services who have not yet received care (Bruffaerts et al., 2018; Zivin et al., 2009). It was also hypothesized that pre-intervention ratings of stress mindset, which reflect a stress-as-enhancing perspective, will be significantly associated with change in psychological symptoms given the psychological protective factors associated with this ethos (Goyer et al., 2018; Huebschmann & Sheets, 2020; Jamieson et al., 2016). Lastly, it was hypothesized that there will be a positive, significant relationship between female, international student, and historically marginalized student participants and internalizing symptom change. Specifically, experiences of disadvantage may be associated with less symptom change due the encumbrance of additional, remarkable stressors associated with discrimination (Clark & Mitchell, 2018; Goodwill et al., 2018; Greer et al., 2011; Hong, 2015; Hurst et al., 2013; Johnson et al. 2014; Kranke et al., 2013; 2014; Seelman et al., 2017; Williams, 2018; Woodford et al., 2014) that may not be adequately addressed in European American centered psychological interventions when compared to students of other genders, domestic students, and students who identify as white.

Research Question #2

What is the unique effect of student pre-intervention anxiety, depression, and stress mindset on change in anxiety with consideration to the interaction of participants' international student status, HMS status, and gender?

It was hypothesized that of the pre-intervention variables mentioned above, that lower student pre-intervention ratings of anxiety and depression, respectively, will be uniquely predictive of decreases in anxiety symptom change. While seemingly contraindicated, because the course is preventive by nature, students with clinically significant symptoms may become more aware of their distressing thoughts, mood, and impairment, consequently resulting in elevated symptom endorsement (Lipson et al., 2019). With regards to student demographic predictors, psychologists and researchers have often failed to account for differences across and within student's multifaceted identities (McCormick-Huhn et al., 2019). For this study, it was hypothesized that variables more frequently associated with greater privilege will account for a significant proportion of the variance associated with symptom change.

Research Question #3

What is the unique effect of student pre-intervention anxiety, depression, and stress mindset on change in depression with consideration to the interaction of participants' international student status, HMS status, and gender?

It was hypothesized that of the pre-intervention variables mentioned above, that lower student pre-intervention ratings of anxiety and depression, respectively, will be uniquely predictive of decreases in depression change for similar reasons as stated above in question two.

Research Question #4

This study also sought to answer what effect, if any, does pre-intervention stress mindset have on the relationship between pre-intervention internalizing symptoms and changes in anxiety post-intervention?

It was hypothesized that stress mindset may have a moderating effect on the relationship between pre-intervention symptoms and anxiety at post-intervention. The emerging literature indicates stress-as-enhancing mindsets may attenuate a person's propensity to encode stressors negatively and accordingly, buffer threats to psychological wellbeing (Huebschmann, & Sheets, 2020).

Research Question #5

Lastly, what effect, if any, does pre-intervention stress mindset have on the relationship between pre-intervention internalizing symptoms and changes in depression post-intervention?

Like the hypothesis stated above under question four, it was hypothesized that stress mindset may have a moderating effect on the relationship between pre-intervention symptoms and depression at post-intervention.

Chapter 3: Method

The previous chapters described the research related to the complex psychosocial stressors experienced by undergraduates, the alarming status of mental health among college students, and related research questions. This chapter focuses on the research methodology, intervention procedures, and design for this study.

Setting & Participants

Survey data for this study was collected at a large, four-year, urban, public university in the Pacific Northwest. Intervention procedures occurred in a naturalistic setting whereby participants received the intervention in a lecture hall and classroom settings. Survey completion was conducted outside of class, whereby, qualitatively, participants oftentimes reported completion in the privacy of their dorm room or university library. Contextually, data collection occurred prior to the covid-19 pandemic which affected community and university operations in winter, 2020.

Participants recruited to participate were all undergraduates who are 18 years old or older and enrolled in the EDUC 215 course titled “Resilience and Wellness in College and Beyond” during the fall 2019 academic quarter. Participants who are 17 years old may have completed the survey described below, though data obtained from these participants was excluded for analyses. Inclusion criteria of participants include enrollment in EDUC 215 fall 2019 and students who are 18 years or older. Students were recruited via email and Canvas announcements. The principal investigator posted a link to the survey on Canvas. As part of the larger research project, researcher team members also served as teaching assistants and thus serve dual relationships with the study population.

Sampling Method

A non-probability, voluntary sampling method was utilized, whereby students registered for EDUC 215 were invited to complete the pre course survey, while students who were still enrolled and completed EDUC 215 after the 10-week quarter were invited to complete the post course survey. Due to the voluntary sampling method and because students were awarded extra credit points for completing the survey, students who have an interest in the topic of the survey as well as those who wanted to boost their grade may have elected to participate (Dillman et al., 2014). The total number of students who completed the survey before the class began ($N = 307$) was greater than the total number of students who completed the survey ($N = 226$), resulting in 73% of students completing both measures. A total of 225 paired surveys were completed. Listwise deletion for missing data was employed. Qualitative review of the missing data and participant characteristics for this case suggests no differences when compared to complete cases. The total, final sample size for this study was $N = 225$. Power analyses were conducted using G*Power statistical software to ensure sufficient power. Specifically, with a sample size of 225, 11 to 13 predictors, and an expected R^2 value ranging from 0.457-0.481, sufficient power was obtained (effect size $f^2 = 0.867 - 0.926$, depending on the given research question and corresponding regression model).

Demographic Characteristics

During the time that the data was collected, the student population at the university was 46% male, 54% female, 59% in-state residents, 40.3% White, 4% Black, 1.1% American Indian, 25.4% Asian, 8% Latinx, 17% International, 0.9% Hawaiian/Pacific Islander, and 3.2% not indicated (University of Washington Office of the Registrar, 2019). Of the participant sample, 35.4% students identified as White ($N = 80$), 2.2% identified as Black ($N = 5$), 0.4% American

Indian (*N* = 1), 47.8% Asian (*N* = 108), 8.4% Latinx (*N* = 19), and 4.4% were not indicated (*N* = 10). The sample was also comprised of 24.3% Males (*N* = 55), 74.8% Females (*N* = 169), and 0.4% non-binary students (*N* = 1) and participants were 18-39 years old (*M* = 18). Freshman was the largest year of study group (*N* = 108), followed by sophomores (*N* = 59), juniors (*N* = 38), and seniors (*N* = 21).

Procedures

As part of a larger study, a survey was electronically distributed to students the first week of class, prior to content delivery. The pre-intervention survey collected baseline data and informed consent was distributed electronically which explained the procedures, purpose of the study, and student rights. Students were able to provide an electronic signature in response to the consent form. If students consented to participate, they were emailed a unique survey link with a corresponding individual access code which was kept separate from their survey responses. Survey administration was completed online through Qualtrics to enable anonymous participant responses and data collected was encrypted to reduce risks related to unauthorized access or use by unintended parties. During finals week, the survey was emailed to students again to collect outcome data, allowing for pre-post comparisons of student wellbeing after participants had completed the course. All procedures and survey items were reviewed and approved by the Human Subjects Division at the University of Washington before this study was conducted.

Intervention Overview

Utilizing core concepts and skills from the three aforementioned evidence-based therapeutic interventions that target relationship skills, internalizing symptoms, and self-harm or suicidal behaviors, the three primary issues that have afflicted a large proportion of undergraduate students (LeViness et al., 2019; Mortier et al., 2018), a ten week, for-credit course

was designed. Table 1 outlines the evidence-based behavior change interventions utilized that are consistent with Michie et al. (2015) taxonomy of Behavior Change Techniques (BCTs). Additionally, a brief description of the intervention within the context of this proposed study, the target behavior, and intervention frequency and duration were tabulated. The behavior change techniques are consistent with social cognitive theory, operant conditioning, and relapse prevention theories (Abraham & Michie, 2008).

This preventive mental health intervention is available every quarter at the University of Washington. Components of the intervention are detailed in Table 2. Students met on Tuesdays for 170 minutes one time per week at the same, reoccurring time for lecture, whereby evidenced-based psychoeducation and skill modeling was provided. Additionally, students met on Fridays for one, 50-minute lab section in groups of 45, which are further divided into 5 person "family groups," for the duration of the quarter. Grouping structure or cohort effects are minimized in both the intervention and statistical designs. Specifically, participant cohort was included as a covariate within the statistical models, while the structure and intervention(s) disseminated during each quiz section was standardized. During quiz sections, participants received additional skill instruction and modeling, practiced skills, and received coaching and corrective feedback from their peers, student skill coaches, and teaching assistants. Quiz section is, arguably, an integral component of the intervention as skill coaching, rehearsal, and feedback has been linked to increased behavior change and skill maintenance (Conley, 2015). A more detailed example of the skills that students learn, practice, and self-monitor are further detailed in the attached diary card as seen in Figure 1.

Lastly, participants completed weekly assignments that were comprised of the following components: lecture reflection, skill reflection, goal setting, reflection on last week's goal,

obstacle planning for past and future goals, gratitude writing, and a reflection on readings for the upcoming week. A glossary of skill definitions, and primary author from which the content is derived is included in Table 1, while an overview of the intervention package is reflected in Table 2.

Implementation Considerations

Core implementation factors, including intervention acceptability, adoption, appropriateness, cost, feasibility, fidelity, penetration, and sustainability (Gerke et al., 2017; Proctor, 2020) guided the development of this project. The EDUC 215 preventive mental health course demonstrates strong acceptability and adoption among faculty, administrators, and students as measured by the College of Education's approval of this course, student enrollment for EDUC 215 consistently meeting capacity (i.e., 400 students/quarter), and faculty satisfaction with devoting a portion of their FTE to instruct the course. Further, student rates of internalizing and relationship issues and suicidal behaviors and the coinciding content of this course reflects strong, perceived fit or appropriateness of the intervention. Outcome research may also better answer if the intervention indeed addresses this particular mental health crisis (Gerke et al., 2017). The cost of the intervention presents modest financial impact when compared to the costliness of overburdened on-campus counseling centers and the financial demands related to individual therapeutic intervention. Implementation feasibility was accounted for through tiered, graduate student training opportunities. Volunteer masters level student skill coaches, paid masters level student reader/graders, and funded doctoral level teaching assistants supported faculty to successfully carry out the many components of the 10-week intervention in return for valuable training opportunities and professional development. To bolster treatment fidelity, weekly volunteer, grader, and teaching meetings were held to promote fidelity to the program

design which was documented in team Google Documents and Microsoft Office Power Points. Additionally, skills taught to students were reviewed and teams reviewed content published by original authors of DBT, ACT, and Positive Psychology to again, maintain strong content fidelity. To support strong process fidelity, lectures were taught by faculty members and/or senior teaching assistants who completed comprehensive training in the aforementioned therapeutic modalities. Treatment dosage was controlled through set, lecture and quiz section times for students, thus furthering intervention fidelity. With regards to implementation penetration, the intervention was offered as a for-credit course and the course also satisfies, in part, the institution's "Individuals and Societies" general education requirement. Continued integration within the course structure and graduation requirements at the university will support penetration of this intervention. And lastly, the preventive intervention supported strong sustainability as evidenced by the course being offered fall, winter, and spring quarters since 2016, serving 200-500 total students per quarter.

Measures

Student demographic data was collected as described above in addition to self-report rating scales measuring psychological symptomology and stress mindset. The survey standardized instructions and students were permitted to discontinue the survey at any point.

Brief Symptom Inventory

The Brief Symptom Inventory-18 is rating scale designed for individuals 18 and older to measure overall psychological distress. It was originally developed by Derogatis in 2001. Respondents rate symptoms along a five-point scale according to how much they have been bothered by the symptom in the prior week. There are 18 items, and total scores are summarized on the Global Severity Index (GSI), while anxiety, depression, and somatization subscale scores

may also be obtained. For the index and composite scores, higher scores suggest greater amounts of distress.

The BSI-18 is normed on gender-specific normative data from community-based, non-clinical populations residing in the United States (Derogatis, 2001). Dimension and global scores obtained from the BSI-18 correlate highly ($r > 0.90$) with Symptom Check-List-90 Revised scores, the more comprehensive, long-form rating scale that assesses global psychological symptoms, that are obtained from a community, non-clinical population (Derogatis, 2001). The BSI-18 has been utilized in college populations whereby strong internal consistency (Cronbach's alpha = 0.83 – 0.87) and temporal stability were supported (Houghton et al., 2012; Houghton et al., 2013). Evaluation of the psychometric properties among Portuguese non-clinical adult population (M = 37.86 y.o.) indicate appropriate construct validity, convergent and discriminant validity, and internal reliability (Nazaré et al., 2017) which were consistent with Lancaster and colleague's evaluation of the psychometric properties of this measure when used among undergraduate varsity athletes in the United States (Lancaster et al., 2016). Further, utilization of the BSI-18 among collegiate athletes yielded no significant differences due to race (Lancaster et al., 2016). It is important to note that while the BSI-18 is a widely used instrument in medical and research settings among non-clinical samples, that it is unknown if the BSI-18 is a useful tool among clinical samples and should be used a screening tool – compared to a diagnostic tool – only (Franke et al., 2017).

Stress Mindset Measure

The Stress Mindset Measure (SMM) is an eight-item rating scale developed by Crum and colleagues (2013) measuring the extent to which an individual views stress as enhancing or as debilitating. Respondents rate attitudes towards stressors on a 5-point Likert-type scale ranging

from zero (strongly disagree) to four (strongly agree). To score this measure, the four negative items (i.e., 1, 3, 5, and 7) items are reversed scored. Then, item scores are summed, and higher scores indicate a stronger stress-is-enhancing mindset. SMM is found to have high internal consistency in adults 18-64 years old (Cronbach's alpha = 0.85 – 0.86) and adequate to high internal consistency in college student populations (Cronbach's alpha = 0.71- 0.84) (Crum et al., 2013; Horiuchi et al., 2018; Kim et al., 2020; Kilby & Sherman, 2016; Park et al., 2018). Review of the literature suggests symmetric distribution, that age and sex is not predictive of SMM scores, and factor analyses support a unifactorial loading (Crum et al., 2013).

Unfortunately, most researchers who utilized the SMM with young adult, undergraduate populations, have failed to report demographic characteristics beyond gender and age nor considered the racial and ethnic assumptions that shifting attitudes towards stress as "enhancing" is universally adaptive given the social context of varied lived experiences with stress and histories of oppression experienced among Black, Indigenous, and People of Color (BIPOC) student groups, students with disabilities, and other historically marginalized groups. Presently, the utilization of the SMM in Greek undergraduates (Karampas et al., 2020), Latino American high school students (Schmidt & Lee, 2020), Korean young adult preschool teachers (M = 22 y.o.) (Kim et al., 2020), rural and urban migrant adolescents in China (Jiang et al., 2019), as well as among Asian American and African American students attending a prestigious university (Crum et al., 2015), all of which suggest adequate to strong internal reliability (Cronbach's alpha = 0.75 - 0.80). Given the increasingly diverse make up of college institutions, critical evaluation of the psychometric properties of measurement scales and validity of constructs across and within student groups is imperative to conducting meaningful and ethical research.

With regards to discriminant and convergent validity, Pearson correlations indicate weak correlation between stress mindset and other measures of stress such as the Social Readjustment Rating Scale, Intolerance of Uncertainty Scale, Social Coping Scale, and Perceived Stress Scale, suggesting stress mindset is not a preexisting construct (Crum et al., 2013). Stepwise multiple regression models evaluating the predictive value of SMM on other factors related to wellbeing and psychological symptomology, reflect SMM is a significant predictor of life satisfaction and mood and anxiety (Crum et al., 2013). Similarly, correlations were obtained to measure convergent and discriminant validity, whereby low SMM scores characterized by greater "stress as debilitating" mindsets were negatively correlated with elevated levels of depression and anxiety (Karampas et al., 2020) while higher SMM ratings characterized by "stress as enhancing" mindsets were positively correlated with elevated ratings of perceived self-efficacy, positive emotions, and effective coping mechanisms (Karampas et al., 2020).

Coding and Transformation of Variables

To ensure an interpretable intercept in the final model gender was effect coded ("Female" = 1, "Not Female" = -1). Effect coding was utilized to better ascertain true estimate of an interaction between categorical variables (Tabachnick & Fidell, 2013). The nominal, categorical variables Historically Marginalized Student (HMS) status were effect coded ("HMS" = 1, "Not HMS" = -1), and FGCS ("FGCS" = 1, "Not FGCS" = -1) as it is not desired to test the linear effect of these predictors (Tabachnick & Fidell, 2013). Racial identity was collapsed into HMS student status due to non-representative sampling and small within group sample sizes (VanEenwyk, 2010). The scientific benefit of continuing to provide racial data, despite representative sampling, may support critical evaluation as to whether this preventive mental health intervention may be reaching and benefiting diverse student groups as it pertains to the

deconstruing of whiteness in psychology (Ahsan, 2020; VanEenwyk, 2010). It is important to note that the term historically marginalized student is an imprecise term and not a racial category. The “non-White” aggregate may harmfully assume an array of sociocultural values, history, and variance in experience of oppression (Gillborn et al., 2018) and thus data was interpreted with particular attention. Lastly, student year of study was transformed into a dichotomous variable and effect coded as 1 = freshman and -1 = not freshman.

BSI-18 anxiety composite scores and BSI-18 depression index scores were calculated from item-level ratings. A BSI-18 anxiety composite was calculated from the raw item level ratings pertaining to the anxiety index, while BSI-18 depression index was calculated from the raw scores assigned to the depression index. Pre-intervention BSI-18 anxiety, pre-intervention BSI-18 depression, post-intervention BSI-18 anxiety, post-intervention BSI-18 depression, BSI-18 anxiety change, and BSI-18 depression change scores were calculated and then standardized. Items that make up the BSI-18 somatization index were excluded as this construct is not of interest for the purpose of this study.

Similarly, SMM ratings were calculated from item-level data and a total SMM score was produced. SMM total pre-intervention, SMM total post-intervention, and SMM change scores were calculated and the scores were standardized for ease of data interpretation.

A Priori Analyses

Completed pre and post surveys were paired for analyses and there was no missing demographic and student outcome ratings of the matched completed pre and post surveys (N = 225). An independent t-test was conducted to test if there are mean score differences in pre intervention measures of anxiety, depression, and stress attitudes between students who completed both pre and post surveys compared to students who only completed the pre

intervention survey. Additionally, item responses within each questionnaire (i.e., BSI-18 and SMM) were analyzed to measure internal consistency (Cronbach, 1951). The Anxiety and depression composites on the BSI-18 as well as the total SMM scores at pre and post intervention were summarized using the mean as a measure of central tendency (Elliott & Woodward, 2007).

Multicollinearity among demographic, symptom cluster composite scores, stress attitude total scores were evaluated by inspecting zero-order correlations. If two variables were highly correlated, the two predictors would have been aggregated or one of the predictors would be removed from the model, though this was not necessary. Acceptable variance inflation factors were assessed to verify that predictive modeling with these variables was suitable (Tabachnick & Fidell, 2013). Following, a priori t-tests were conducted to verify if significant differences exist between student demographic predictors per dependent variable.

Assumptions

Normality, linearity, and homoscedasticity of residuals were reviewed by visual analysis of scatterplots, histograms, and q-q plots of the residuals of each predictor to ensure that linear regression model assumptions were tenable. Normal distribution and regularity in spread indicate tenable normality and homoscedasticity statistical assumptions while the absence of curvilinearity of residuals depicted in the scatterplot supports a normal distribution (Osborne et al., 2002). Threats to independence resulting from the nested structure of the data was addressed by including confounding variables within the regression model.

Prospective Threats to Validity

Characteristics of students who enrolled in EDUC 215 and of that population, participants who completed both pre- and post-intervention surveys, are unlikely to be

representative of the larger population of students enrolled at the large, 4-year PWI, which represents a substantial threat to external validity. Qualitatively, students who enroll in the course often report being interested in psychology, education, need an "easier class," or their advisor recommended it. While undergraduates enrolled in this preventive mental health course are likely to benefit from participation in this intervention, research findings may not be applicable to the broader college population without replication among a broader range of students, achieved through random sampling or if the course was offered as a university graduation requirement.

Therefore, because the proposed study is not a randomized control trial, student outcomes over time may be associated with participation in the course, while causal claims cannot be determined. Change over time may be discussed, but cohort, maturation, or other confounding variables that may have contributed to change over time may not be controlled for.

Consequently, this study design presents threats to internal validity which necessitate further discussion. As is the nature of studying human behavior and wellbeing, particularly in a natural research design, specific variables that may threaten internal validity include student enrollment in individual therapy or concurrent intervention during the time of the 10-week course, academic stressors increasing as the academic quarter progresses, and psychiatric history. Unfortunately, this data was not collected. With regards to measurement errors and testing, threats of instrumentation and testing may impact internal validity because the scientifically validated measures were not validated with the exact population being tested, although student samples were similar. Standardized survey delivery methods and scoring procedures were utilized.

Statistical Analyses

For the current study, data are presented for college students who completed the EDUC 215 preventive mental health course titled "Resilience and Wellness in College and Beyond," fall quarter of 2019 and who completed pre and post survey measures to evaluate the relationship between a variety of student factors including pre-intervention internalizing symptoms, pre-intervention attitudes about stress, and the interaction of students' demographics, and changes in internalizing symptoms post-intervention.

Descriptive Statistics and Correlations

Means, standard deviations, and zero-order correlations among all variables were calculated to evaluate the relationship between pre-intervention student mental health measures (e.g., BSI-18 anxiety and BSI-18 depression), pre-intervention stress mindset, and student demographic factors including first-generation student status, historically marginalized student status, freshman status, and gender and change in anxiety and depression scores, respectively.

Multiple Linear Regression

To answer the remaining research aims of this study, data was analyzed using multiple linear regression with sequential predictor entry. Multiple linear regression is an analytical procedure that estimates the unique relationship between one dependent variable and multiple independent variables (Tabachnick & Fidell, 2013). A multiple linear regression model with sequential predictor entry was used to determine the unique effect of student pre-intervention levels of anxiety and depression on change in anxiety after controlling for the interaction effects among student demographic factors. Sequential predictor entry is of use because it specifically allows for testing incremental variance accounted for as predictors are added to the regression models (Tabachnick & Fidell, 2013).

Due to the multiple demographic variables of interest and with respect to intersectionality of student identities, one statistical analysis method that has been shaped by Intersectionality Theory that was utilized to explore the interaction of these demographic variables is Critical Quantitative Analyses (Else-Quest & Hyde, 2016). One key element, as part of the analysis processes, is to measure multiple ways students may be systemically advantaged and disadvantaged (Duran et al., 2020; McCormick-Huhn et al., 2020). This method disrupts the monolithic demographic research trends within education and psychology (Kilgo et al., 2019) by more holistically representing the "person" that psychologists aim to better understand. Therefore, to avoid non-independence of residuals, demographic variables in addition to quiz section number (e.g., a prospective grouping effect) was accounted for in the regression models while demographic factors were included as interaction terms with respect to Critical Quantitative Analyses and more recent APA research standards (Clauss-Ehlers et al., 2019).

To answer question two, what is the unique effect of student pre-intervention levels of anxiety, depression, and stress mindset on change in anxiety after controlling for the interaction between student demographic factors, the following regression model was applied. Block one includes freshman, female, first generation college student, and historically marginalized student status in addition to quiz section group; block two includes student indicators of anxiety and depression prior to intervention, block three includes students' pre-intervention stress mindset, and block four includes the interaction between demographic variables of interest as it relates to experiences of advantage and disadvantage.

$$Y_{hat}\ (\text{Anxiety Chg}) = b_0 + b_1 * \text{Freshman} + b_2 * \text{Female} + b_3 * \text{FGCS} + b_4 * \text{HMS} + b_5 * \text{Group} + b_6 * \text{Anxiety Pre} + b_7 * \text{Depression Pre} + b_8 * \text{Stress Mindset Pre}$$

$$+ b_9 * (\text{Female} * \text{FGCS}) + b_{10} * (\text{FGCS} * \text{HMS}) + b_{11} * (\text{Female} * \text{HMS})$$

In the model above, change in student anxiety is equal to the conditional mean (b_0), plus the unique effects of freshman status (b_1), female gender (b_3), first generation college student (b_3), historically marginalized student status (b_4), and quiz section group (b_5), plus the unique effect of pre-intervention anxiety (b_6) and depression anxiety (b_7) in addition to the unique effect of pre-intervention stress mindset (b_8) and the interaction of female and FGCS status (b_9), interaction of FGCS and HMS status (b_{10}), and the interaction of female and HMS status (b_{11}).

Like the model above, a multiple linear regression model with sequential predictor entry was used to answer question three, to examine the unique effect of student pre-intervention levels of anxiety, depression, and stress attitudes on change in depression after controlling for the interaction effects among student demographic factors. Block one includes freshman, female, first generation college student, historically marginalized student status, and quiz section group; block two includes student indicators of anxiety and depression prior to intervention, block three includes students' pre-intervention stress mindset, and block four includes the interaction between demographic variables of interest as it relates to experiences of advantage and disadvantage. The following multiple linear regression model was followed:

$$\begin{aligned} Y_{hat}\ (\text{Depression Chg}) = {} & b_0 + b_1 * \text{Freshman} + b_2 * \text{Female} + b_3 * \text{FGCS} + b_4 * \text{HMS} + b_5 * \text{Group} \\ & + b_6 * \text{Anxiety Pre} + b_7 * \text{Depression Pre} \\ & + b_8 * \text{Stress Mindset Pre} \\ & + b_9 * (\text{Female} * \text{FGCS}) + b_{10} * (\text{FGCS} * \text{HMS}) + b_{11} * (\text{Female} * \text{HMS}) \end{aligned}$$

In the model above, change in student depression is equal to the conditional mean (b_0), plus the unique effects of freshman status (b_1), female gender (b_3), first generation college

student (b_3), historically marginalized student status (b_4), and quiz section group (b_5), plus the unique effect of pre-intervention anxiety (b_6) and depression anxiety (b_7) in addition to the unique effect of pre-intervention stress mindset (b_8) and the interaction of female and FGCS status (b_9), interaction of FGCS and HMS status (b_{10}), and the interaction of female and HMS status (b_{11}).

To analyze the moderating effect, if any, that pre-intervention stress mindset has on the relationship between pre-intervention internalizing symptoms and changes in anxiety post-intervention a multiple linear regression model with sequential predictor entry was used to answer question four. Like the previous models, block one includes freshman, female, first generation college student, historically marginalized student status, and quiz section group; block two includes student indicators of anxiety and depression prior to intervention, block three includes students' pre-intervention stress mindset ratings, and block four includes the interaction between demographic variables of interest as it relates to experiences of advantage and disadvantage. Block five includes the interaction between preintervention stress mindset and anxiety symptoms, as well as the interaction term of pre-intervention stress mindset and depression symptoms. The following multiple linear regression model was followed:

$$\begin{aligned} Y_{hat}\ (\text{Anxiety Chg}) = b_0 \quad & + b_1 * \text{Freshman} + b_2 * \text{Female} + b_3 * \text{FGCS} + b_4 * \text{HMS} + b_5 * \text{Group} \\ & + b_6 * \text{Anxiety Pre} + b_7 * \text{Depression Pre} \\ & + b_8 * \text{Stress Mindset Pre} \\ & + b_9 * (\text{Female} * \text{FGCS}) + b_{10} * (\text{FGCS} * \text{HMS}) + b_{11} * (\text{Female} * \text{HMS}) \\ & + b_{12} * (\text{Stress Mindset Pre} * \text{Anxiety Pre}) + b_{13} * (\text{Stress Mindset Pre} * \text{Depression Pre}) \end{aligned}$$

In the model above, change in student anxiety is equal to the conditional mean (b_0), plus the unique effects of freshman status (b_1), female gender (b_3), first generation college student (b_3), historically marginalized student status (b_4), and quiz section group (b_5), plus the unique effect of pre-intervention anxiety (b_6) and depression anxiety (b_7) in addition to the unique effect of pre-intervention stress mindset (b_8), plus the interaction of female and FGCS status (b_9), interaction of FGCS and HMS status (b_{10}), and the interaction of female and HMS status (b_{11}), and the interaction of pre-intervention stress mindset and anxiety symptoms (b_{12}), and the interaction of pre-intervention stress mindset and depression symptoms (b_{13}).

Lastly, to analyze the effect, if any, that pre-intervention stress mindset has on the relationship between pre-intervention internalizing symptoms and changes in depression post-intervention, a multiple linear regression model with sequential predictor entry was used to answer question five. For this model, block one includes freshman, female, first generation college student, historically marginalized student status, and quiz section group; block two includes student indicators of anxiety and depression prior to intervention, block three includes students' pre-intervention stress mindset, and block four includes the interaction between demographic variables of interest as it relates to experiences of advantage and disadvantage, while block five includes the interaction between preintervention stress mindset and anxiety symptoms, as well as the interaction term of pre-intervention stress mindset and depression symptoms. The following multiple linear regression model was followed:

$$Y_{hat}\ (\text{Depression Chg}) = b_0 + b_1 * \text{Freshman} + b_2 * \text{Female} + b_3 * \text{FGCS} + b_4 * \text{HMS} + b_5 * \text{Group} + b_6 * \text{Anxiety Pre} + b_7 * \text{Depression Pre} + b_8 * \text{Stress Mindset Pre}$$

$+ b_9$* (Female * FGCS) + b_{10}* (FGCS * HMS) + b_{11}* (Female * HMS)

$+ b_{12}$* (Stress Mindset Pre * Anxiety Pre) + b_{13}* (Stress Mindset Pre * Depression Pre)

In the model above, change in student depression is equal to the conditional mean (b_0), plus the unique effects of freshman status (b_1), female gender (b_3), first generation college student (b_3), historically marginalized student status (b_4) and quiz section group (b_5), plus the unique effect of pre-intervention anxiety (b_6) and depression anxiety (b_7) in addition to the unique effect of pre-intervention stress mindset (b_8), plus the interaction of female and FGCS status (b_9), interaction of FGCS and HMS status (b_{10}), and the interaction of female and HMS status (b_{11}), and the interaction of pre-intervention stress mindset and anxiety symptoms (b_{12}), and the interaction of pre-intervention stress mindset and depression symptoms (b_{13}).

Chapter 4: Results

The results of this study are reported in this chapter. Hypotheses were tested using zero order correlations and multiple linear regression analyses to examine the relationship between student demographic factors, quiz group membership, and pre-intervention internalizing symptoms on changes in students' anxiety and depression.

Tests of Assumptions

To achieve the best linear, unbiased estimators it was important to meet the axioms of ordinary least square multiple linear regression (Osborne & Waters, 2002; Tabachnick & Fidell, 2013). Assumptions for ordinary least square multiple regression were tested before each regression analysis (i.e., normality, linearity, homoscedasticity, multicollinearity, and independence of residuals) (Osborne & Waters, 2002; Tabachnick & Fidell, 2013).

Normality

The results for the Shapiro Wilk test (Shapiro & Wilke, 1965) indicate the continuous variables did not follow a normal distribution. However, the results of skewness and kurtosis for the same variables were within the acceptable bounds of the normal distribution of the data -2 to +2 (George & Mallery, 2010). The assumption of normality among the residuals was also nested using P-P plots shown in Figures 2-7. The results show that the residuals are also normally distributed, thus the assumption of the normal distribution of the data was met (Osborne et al., 2002).

Multicollinearity

Multicollinearity was assessed using two approaches. First, review of the correlation matrix highlighted the magnitude and the direction of the relationship between the variables. The results show that the correlation between the predictors of each regression model was less than

0.70 ($r < .70$). Second, the variance inflation factor (VIF) was used. VIF values were significantly less than 10.0 which suggests the assumption of no multicollinearity was met.

Independence of the Residuals

The Durbin-Watson *d* was conducted to examine the independence of residuals (Durbin & Watson, 1951). The Durbin-Watson scores were close to 2.0, indicating the assumption of the independence of residuals was met (Durbin & Watson, 1951; Tabachnick & Fidell, 2013).

Linearity and Homoscedasticity

The linearity assumption refers to the linearity in the parameter assumptions, which was tested via visual inspection of the scatter plots (Tabachnick & Fidell, 2013). Further, the principle of homoscedasticity was tested by plotting fitted values against the residuals. As illustrated in Figures 8 – 28, the results suggest that both linearity and constant variance assumptions were met.

Correlations

Descriptive statistics including means, standard deviations, and zero order correlations for the observed variables are reported below. Zero order correlation results were also used to answer the first research question.

Hypothesis #1

It was hypothesized that there are modest, though significant negative correlations between change in internalizing symptoms and pre-intervention internalizing symptoms (e.g., anxiety and depression, respectively). It was also hypothesized that higher ratings of stress mindset, which reflect a stress-as-enhancing perspective, will be associated with greater change in internalizing symptoms. It was also hypothesized that there will be no significant correlations

between female, international student, nor historically marginalized student participants and internalizing symptom change.

According to the results presented in Table 4, there was a significant, moderate, zero-order negative correlation between pre-intervention levels of anxiety and students' change in anxiety ($r = -0.42$, $p < 0.01$). There was also a weak, though statistically significant relationship between pre-intervention levels of anxiety and students' change in depression ($r = -0.27$, $p < 0.01$). In other words, higher levels of pre-intervention anxiety symptoms were associated with reductions in both anxiety and depression following completion of EDUC 215.

There was a weak, though significant negative correlation between pre-intervention levels of depression and students' change in anxiety symptoms ($r = -0.25$, $p < 0.01$), and a moderate, significant correlation between pre-intervention levels of depression and students' change in depression symptoms ($r = -0.42$, $p < 0.01$). This suggests higher levels of pre-intervention depression symptoms were associated with greater reductions in anxiety and depression symptoms following completion of the 10-week course.

Students' pre-intervention attitudes about stress were not significantly correlated with anxiety nor depression symptom change. There was, however, a weak, though statistically significant negative relationship between pre-intervention anxiety and depression, respectively, and stress mindset scores ($r = -0.23$, $p < 0.01$, $r = -0.33$, $p < 0.01$), suggesting higher pre-intervention internalizing symptoms (e.g., anxiety and depression, respectively) were associated with less adaptive attitudes about stress (e.g., lower stress mindset scores). Results indicated that being female, international student, nor historically marginalized student status were not significantly associated with anxiety nor depression symptom change. Additional pre-

intervention factors including freshman status and quiz group membership were also not significantly associated with change in students' symptoms.

Regression Models

To test the remaining hypotheses, multiple linear regression with sequential predictor entry was used to predict changes in anxiety and depression levels. This was also used to predict the moderating effect of stress mindset on symptomology change.

Hypothesis #2

The second hypothesis states student pre-intervention anxiety, pre-intervention depression, and pre-intervention stress mindset significantly explain a change in anxiety. Multiple linear regression with sequential predictor entry was used to predict change in anxiety symptoms. Results are displayed in Table 5. Freshman, female, international, historically marginalized student status, and quiz section group, which comprised the first block did not account for significant variation in student changes in anxiety, $R^2 = 0.01$ ($R^2_{adjusted} = -0.01$), $F(5, 219) = 0.56$, $p = 0.732$. Specifically, these pre-intervention student demographic factors in addition to quiz group membership accounted for 1% of the variance in anxiety symptom change. Block two, which included pre-intervention student demographic and quiz section group factors in addition to pre-intervention symptomology (e.g., anxiety and depression), accounted for significant variation in anxiety symptom change, $R^2_{change} = 0.19$, $F_{change}(2, 217) = 25.96$, $p < 0.001$ ($R^2_{total} = 0.20$ and $R^2_{adjusted} = 0.18$). Students' pre-intervention levels of anxiety and depression accounted for an additional 19% of the significant, unique variation anxiety symptom changes after accounting for the block one demographic and quiz group factors. In the third block, pre-intervention attitudes about stress (e.g., stress mindset) accounted for an additional 0.2% of the variance in anxiety symptom change above and beyond pre-intervention student

factors, quiz group membership, and pre-intervention anxiety and depression symptoms; this did not add significantly to the model. Likewise, the fourth block, which included interaction terms of student demographic variables, did not significantly add to the model fit. Specific model fit statistics are presented in Table 7.

Overall, the results suggest that the model was a significant fit at a 5% level of significance across blocks 2-4 ($p < .05$). The R^2 for block 4 is highest 0.209, suggesting that the predictors explain 20.9% variation in the students' change in anxiety. In the final model, with all predictors entered, the mean predicted anxiety symptoms change score for students with average pre-intervention internalizing symptoms, average pre-intervention attitudes about stress, irrespective of freshman, female, international, or historically marginalized status nor quiz section group, was estimated to be b = -0.335 points, $SE = 0.51$, $t(213) = -0.65$, $p = 0.515$. Of note, pre-intervention anxiety had a significant impact on decreasing anxiety symptoms (b = -1.836, SE = 0.34, $t(213) = -5.36$, $p < .05$, $sr^2 = 0.107$). Specifically, for every one standard deviation increase in pre-intervention anxiety levels, anxiety symptoms were predicted to decrease by 1.836 points, holding all else constant. The amount of variation in anxiety reductions attributed to pre intervention anxiety is 10.7%, while controlling for the effects of other variables. The pre-intervention attitudes about stress and the pre-intervention levels of depression did not significantly explain the decrease in anxiety, nor were there any significant interaction effects between student demographic factors.

Hypothesis #3

The third hypothesis states that student pre-intervention anxiety, pre-intervention depression, and pre-intervention mindset significantly explain a change in depression. Results showed that freshman, female, international, historically marginalized student status, and quiz

section group, which comprised the first block, did not account for significant variation in student changes in depression, $R^2 = 0.04$ ($R^2_{adjusted} = 0.02$), $F(5, 219) = 1.75$, $p = 0.123$. Specifically, these pre-intervention student demographic factors in addition to quiz group membership accounted for 4% of the variance in student depression symptom change. Block two, which included pre-intervention student demographic and quiz section group factors, in addition to pre-intervention symptomology (e.g., anxiety and depression), accounted for significant variation in depression symptom change, $R^2_{change} = 0.17$, $F_{change}(2, 217) = 23.09$, $p < 0.001$ ($R^2_{total} = 0.21$ and $R^2_{adjusted} = 0.18$). Students' pre-intervention levels of anxiety and depression accounted for an additional 17% of the significant, unique variation in depression symptom changes after accounting for freshman, female, international, historically marginalized, and quiz group student factors. In the third block, pre-intervention attitudes about stress (e.g., stress mindset) accounted for an additional 0.1% of the variance in depression symptom change above and beyond pre-intervention student factors, quiz group membership, and pre-intervention attitudes about stress. In the fourth block, the interaction between demographic variables of interest as it relates to experiences of advantage and disadvantage (e.g., international student status, historically marginalized student status, and female status interaction terms), accounted for an additional 0.7% of the variance in depression symptom change after controlling for the aforementioned variables described in blocks 1-3.

The results of the final model suggest that the model was a significant fit at a 5% level of significance across blocks 2-4 ($p < .05$). The R^2 for model 4 is 0.215, suggesting that the predictors, namely pre-test scores in depression, explain 21.5% variation in the students' change in depression. In the final model, with all predictors entered, the mean predicted depression symptoms change score for students with average pre-intervention internalizing symptoms,

average pre-intervention attitudes about stress, irrespective of freshman, female, international, or historically marginalized status nor quiz section group, was estimated to be b = -0.017 points, SE = 0.46, $t(213)$ = -0.04, p = 0.970.

The pre-intervention demographic coefficients and quiz group membership did not uniquely predict depression symptom reductions. Pre-intervention depression, however, had a significant impact on decreasing depression (b = -1.819, SE = 0.35, $t(213)$ = -5.28, p <.001, sr^2 = 0.103). Specifically, for every standard deviation increase in pre-intervention depression levels, depression symptoms were predicted to decrease by 1.819, holding all else constant and the amount of variation depression reductions attributed to pre intervention depression is 10.3%, while controlling for the effects of other variables. Neither pre-intervention levels of anxiety nor pre-intervention attitudes about stress uniquely predict decreased depression symptoms. Like hypothesis two, there were no significant interactions between student demographic factors. All results testing hypothesis three are reported in Table 8.

Hypothesis #4

Hypotheses four and five aim to assess the prospective moderation effect of pre-intervention attitudes about stress. The fourth hypothesis states that the pre-intervention stress mindset significantly moderates the relationship between pre-intervention internalizing symptoms (e.g., anxiety and depression, respectively) and changes in anxiety post-intervention. To analyze the moderating effect, if any, that pre-intervention stress mindset has on the relationship between pre-intervention anxiety, pre-intervention depression, and changes in anxiety post-intervention, a multiple linear regression model with sequential predictor entry was used. Interaction variables were employed, whereby the proposed pre-intervention stress mindset moderator was multiplied with the independent variables, pre-intervention anxiety and pre-

intervention depression, respectively. Like the previous models, block one includes freshman, female, international student status, historically marginalized student status, and quiz section group; block two includes student indicators of anxiety and depression prior to intervention, block three includes students' pre-intervention stress mindset ratings, and block four includes the interaction between demographic variables of interest as it relates to experiences of advantage and disadvantage. Block five includes the interaction between preintervention stress mindset and anxiety symptoms, as well as the interaction term of pre-intervention stress mindset and depression symptoms.

The results suggest that the model was a significant fit at a 5% level of significance across blocks 2-5 ($p < .05$). The R^2 for model 5 is 0.228, suggesting that the predictors explain 22.8% variation in the students' change in anxiety. Pre-intervention anxiety had a significant unique impact on reduced anxiety symptoms ($b = -1.782$, $SE = 0.34$, $t(211) = -5.19$, $p < .001$, $sr^2 = 0.10$), and pre-intervention anxiety explains a 9.9% variation in the change in anxiety. Anxiety was the only statistically significant predictor. Pre-intervention stress mindset, pre-intervention depression, the interaction between the pre-intervention stress mindset measure and pre-intervention anxiety, and the interaction between pre-intervention stress mindset and pre-intervention depression did not significantly explain anxiety reductions, respectively. Results from this regression analysis are further reported in Table 9.

Hypothesis #5

Lastly, the fifth hypothesis states that the pre-intervention stress mindset significantly moderates the relationship between pre-intervention internalizing symptoms (e.g., pre-intervention anxiety and pre-intervention depression, respectively), and changes in depression. To analyze the moderated effect, if any, that pre-intervention stress mindset has on the

relationship between these pre-intervention internalizing symptoms and changes in depression post-intervention, a multiple linear regression model with sequential predictor entry was used. The blocks of this model are consistent with the blocks utilized in the previous model described under hypothesis four. The results, presented in Table 10 suggest that the model was a significant fit at a 5% level of significance across blocks 2-5 ($p < .05$). The R^2 in block 5 is 0.232, suggesting that the predictors explain 23.2% variation in the students' change in depression.

Higher, pre-intervention depression has a significant unique impact on decreases in depression symptoms ($b = -1.906$, $SE = 0.35$, $t(211) = -5.51$, $p < .05$, $sr^2 = 0.110$), and this explains 11% variation in depression reductions. Pre-intervention stress mindset, pre-intervention anxiety, nor the interaction between pre-intervention stress mindset and pre-intervention depression do not significantly explain the change in depression.

There was a significant interaction between pre-intervention stress mindset and pre-intervention levels of anxiety on depression symptom change, $b = 0.778$, $SE = 0.38$, $t(211) = 2.06$, $p = 0.04$, $sr^2 = 0.02$. To understand the nature of the interaction, predicted values were plotted for each group by two pre-intervention levels (low = -1*SD* and high = +1*SD*) which is provided in Table 11. As illustrated in Figure 29, depression symptoms decreased among students who endorsed high pre-intervention anxiety but espoused more "stress-as-enhancing" beliefs, holding all else constant. Specifically, students with one standard deviation above average pre-intervention levels of stress mindset (e.g., more stress-as-enhancing mindsets) who also endorsed low levels of pre-intervention anxiety predicted the greatest decrease in depression by -2.22 points over students with similar stress mindset ratings and high pre-intervention anxiety (-1SD). The effect of below average pre-intervention levels of stress mindset (e.g., more stress-as-debilitating mindsets) among students who endorsed above average levels of pre-

intervention anxiety (+1 SD) predicted increases in depression symptoms by -0.892 points over students with similar stress mindset ratings and below average levels of anxiety (-1SD).

Chapter 5: Discussion

A summary of the research method, aims, and results, the implications and limitations of the findings, and related future research directions are presented in this chapter. A goal of this study was to explore anxiety and depression outcomes associated in a sample of college students who completed a preventive mental health course. Hypotheses were tested using multiple linear regression analyses to examine the associations between demographic factors, quiz group membership assignment, pre-intervention internalizing mental health symptoms, and attitudes about stress on change in anxiety and depression symptoms. Promisingly, results indicated that, on average, higher pre-intervention anxiety levels predicted greater drops in overall anxiety symptom levels, while higher pre-intervention depression levels predicted reduced depression symptoms following completion of the course. Moreover, the interaction of pre-intervention stress mindset and pre-intervention levels of anxiety was predictive of depression symptom change which is further detailed below. Pre-intervention attitudes about stress independently did not predict internalizing symptom changes. Finally, quiz section group membership and demographic factors including gender, international student status, and historically marginalized student status were not significant factors on student outcomes. This is the first known study to explore student anxiety and depression outcomes among a large sample of students who participated in a comprehensive, preventive mental health intervention within the higher education context. The results and implications of this study are discussed in greater detail below.

Pre-Intervention Internalizing Symptom Factors

Pre-Intervention Anxiety

Pre-intervention anxiety had a significant unique impact on the change in the anxiety. Students who enrolled in the course with higher levels of anxiety tended to show a greater reduction in anxiety symptoms. Pre-intervention anxiety accounted for approximately one tenth of the variation in anxiety symptom change while controlling for the other effects of the other factors included in the regression model as noted in Table 7. While it was hypothesized that students with elevated symptoms may become more aware of their distressing thoughts, mood, and impairment, consequently resulting in elevated symptom endorsement at post-intervention (Lipson et al., 2019), this data does not suggest an iatrogenic effect. Of note, the average pre-intervention anxiety score fell within the average range and scores were normally distributed. While the effect size of this finding is small given the general subclinical sample of college students recruited for this universal intervention, it is remarkable that average levels of anxiety significantly predicted decreases in anxiety symptoms. Prior literature on middle and high school social emotion learning programs suggests that students with higher mental health symptoms may not benefit from prevention programs alone, as their symptoms may in fact be exacerbated (Lipson et al., 2019a). Within this study, however, it is encouraging that students with higher pre-intervention levels of anxiety predicted the greatest decrease in anxiety, which suggests the preventive mental health course may be beneficial for a broad range of students, consistent with the tiered, public health approach (August et al., 2018; McIntosh & Goodman, 2016). These results are especially important given the limited existing research substantiating a universal level preventive mental health intervention for college students (Conley, 2013; Parcover et al., 2015; Weissberg et al., 2015).

Pre-intervention anxiety did not significantly predict improvements in depression symptoms. While anxiety and depression are often co-morbid or co-occurring (APA, 2019), this finding may suggest that decreases in depression are better described by other factors. Improvements in sense of belonging (Joiner, 2007; Van Ordern, 2010) hopefulness (Huffman et al., 2014), gratitude (Bohlmeijer et al., 2020; Kerr et al., 2015; Seligman et al., 2014), or cognitive restructuring (Rhode et al., 2016; Rhode et al., 2018), may better explain depression symptom reduction. These latent variables, however, were not included in the statistical model. Nevertheless, this research finding highlights the importance of scope, whereby mental health interventions at the universal, preventive level should teach college students several skills that address protective factors pertaining to multiple, common psychopathology symptom clusters, as the absence of psychopathology in one area may not inspire nor predict change in a different symptom area.

Pre-Intervention Depression

Pre-intervention depression uniquely predicted change in depression ratings. Students who entered the course with higher levels of depression tended to show a greater reduction in depression symptoms. This accounted for approximately 10% of the change in depression levels while controlling for the effects of the other factors included in the model. It was hypothesized that students with more elevated symptoms may become more aware of their distressing thoughts, mood, and impairment, consequently resulting in higher symptom ratings at post-intervention, and therefore a positive symptom change score (Lipson et al., 2019a). The data does not suggest, however, any adverse effects related to depression. This could be attributable to effective screening and triage processes for students who are identified during the intervention and referred to more targeted services (e.g., Tier-II or Tier-III programming) while subsequently

completing the course. Although the effect size of this finding is small ($sr^2 = 0.103$), it is encouraging that average levels of depression significantly predicted improvements (e.g., decreases) in depression symptoms among a preventive, universal college student sample and that students with more elevated depression levels were predicted to experience greater relief.

Pre-intervention depression did not significantly predict changes in anxiety symptoms. Changes in anxiety may be better described by other factors such as mindfulness (Huang et al., 2018), values clarification (Grégoire et al., 2018; Levin et al., 2017), or distress tolerance (Üstündağ-Budak et al., 2019). These constructs, however, were not included in the present statistical model. Again, this emphasizes the importance of reinforcing and teaching students several skills that may prevent psychopathology, in general, across the general college student population.

Pre-Intervention Stress Mindset Effects

It was hypothesized that pre-intervention attitudes about stress (e.g., stress mindset) may predict internalizing symptom changes, though stress mindset was not a significant, unique factor. It was also hypothesized that stress mindset would have moderating effects on the relationship between pre-intervention internalizing symptoms and anxiety or depression at post-intervention, respectively. No moderating effects were detected; this is because the individual effects of stress mindset on the dependent variables were not significant. Because stress mindsets are not fixed (Crum, 2013), changes in stress mindset or stress mindsets at post-intervention may be a better predictive factor of internalizing symptom change.

There was a significant interaction, however, between pre-intervention stress mindset and pre-intervention levels of anxiety on depression symptom change. Students with high levels of pre-intervention anxiety and high, pre-intervention stress-as-enhancing mindsets predicted an

increase in depression symptoms. This finding indicates that a more beneficial stress attitude alone may not be sufficient in decreasing mental health symptoms, especially if symptom levels are particularly elevated. This reinforces the importance of a multi-faceted intervention that teaches students numerous skills, compared to single skill or narrow focused interventions that have yielded modest effects, at best, among small sample sizes (Dvořáková et al., 2017; Rohde et al., 2014; Schwartz et al., 2018; Waithaka et al., 2018).

Students with low levels of anxiety and stress-as-debilitating mindsets at pre-intervention predicted increases in depression symptoms as shown in Figure 29. This suggests that despite the absence of psychopathology, that the absence of effective stress attitudes may leave students susceptible to mental health issues which is consistent with the emerging literature (Crum et al., 2017; Jamieson et al., 2016). On the other hand, and much to the researcher's surprise, students with higher pre-intervention anxiety and stress-as-debilitating mindsets predicted a reduction in depression symptoms. This relationship yielded a small effect size ($sr^2 = 0.02$) and the changes in depression may be better explained by other factors, such as the use of new skills like "radical acceptance," the "wave skill," or "opposite action" (Linehan, 2014) that participants learned and practiced as part of the preventive course. Alternatively, given the indicators of greater psychopathology, these students may have been more "bought in" to the class and were perhaps more effective in their skill acquisition and practice given the greater and more immediate desire for symptom relief. These effects could also be due to statistical regression to the mean.

Lastly, low levels of anxiety and high stress mindset scores (e.g., stress-as-enhancing attitudes) at pre-intervention predicted the most improvement in depression symptoms (e.g., a decline in depression symptoms). Because co-morbid psychological symptom presentations or multiple problem mental health issues may often be more difficult to treat, this relationship

suggests that when anxiety symptoms are low and students' present an effective stressor encoding attitude, that subclinical depression symptoms may be more susceptible to preventive intervention, though additional analyses are needed to identify why the interaction effect is significant. This is consistent with prior literature suggesting stress-as-enhancing mindsets may attenuate a person's propensity to encode stressors negatively and accordingly, moderate the stress-depression relationship (Huebschmann, & Sheets, 2020). This finding also adds to the literature on how stress-as-enhancing attitudes may be particularly effective in thwarting off depression (or exacerbating depression symptomatology) (Park et al., 2018). In general, low psychopathology coupled with a more resilience-boosting attitude about stressors suggests that if low symptomatic students' effective stressor-encoding processes can be harnessed and explicitly reinforced, students may continue to experience mental health benefits.

Demographic Factors

It was hypothesized that variables more frequently associated with greater privilege would account for a significant proportion of the variance associated with anxiety and depression symptom changes. Pre-intervention demographic coefficients did not account for significant variation in student changes in anxiety nor depression and the interaction terms of these variables also did not significantly add to the model fit. Ultimately variables associated with greater privilege did not account for a significant proportion of the variance associated with internalizing symptom change.

These findings may suggest that students' pre-intervention demographic factors do not play a significant role in determining whether the student may benefit from the intervention as measured by change in internalizing symptoms. While causality certainly cannot be implied, these findings are encouraging as it suggests the current course design may be responsive to the

increasingly diverse student population, despite European American centered theoretical origins of most psychological modalities. The non-significant findings are also consistent with the ongoing examination and debate regarding mental health rates and acuity of symptomology across racial and ethnic groups. While some research suggests differences in mental health rates across racial and ethnic groups (Lipson et al., 2019a; Liu et al., 2019; Williams, 2018), the results of this current study are consistent with the substantial research that points to weak associations (Auerbach et al., 2018) or no significant differences in mental health concerns specifically among college student samples (Eisenberg et al., 2007; Xiao et al., 2017).

Additional pre-intervention factors that were nonsignificant included quiz group membership and freshman status. Consequently, the quiz section group, nor the students' year of study did not significantly account for changes in internalizing symptoms. Given the routinized structure of the intervention and intensity of training required of intervention facilitators, it is not surprising that quiz group membership was nonsignificant. Further, the insignificance of freshman status suggests that student mental health experiences are not specific to the first year of college, though the first year of college has been argued to be the most psychologically taxing (Arnett & Hughes, 2014).

Limitations and Future Research Directions

This study is not without its limitations. Limitations include homogenous sample, coding restraints, model predictive abilities, and the non-randomized study design. The sample of this current study was homogenous as it relates to student year of study, gender, and there were also insufficient group sizes within non-white student groups. The current sample reflects an overrepresentation of freshman and female students compared to the general population which limits the generalization abilities of this study to other university settings. Due to the low number

of male students, for example, this presents a barrier for accurate modeling across gender. Follow up studies that capture male and non-freshman student experiences will allow researchers to better understand significant demographic effects if present. Relatedly, the sample and dataset resulted in coding restraints. The historically marginalized student variable was dichotomized to reflect historically marginalized versus non-historically marginalized due to the relatively small racial groups within the college student sample enrolled in the preventive course. While more students identified as a historically marginalized student, the dichotomized variable used resulted in a loss of important information about the unique experiences within these student groups.

A second limitation is that the regression models utilized to answer the research questions support an adequate, significant fit, yet the predictive ability of the final models were low and explained anywhere from 20-23.2% of the total variance, depending on the given research question. This posed a threat to the internal validity of this study. This may be due to the inclusion of "noisy" variables and the absence of more adequate predictors (Tabachnick & Fidell, 2013). Each independent variable did not predict a significant nor independent portion of the variability of the respective dependent variables which threatens the predictive ability of the regression model (Tabachnick & Fidell, 2013). Related to the predictive ability of the model, difference scores were utilized to measure change and this methodology tends to yield negative correlations to pre-test scores, thus increasing the risk of false positive errors (Linn & Slinde, 1977). For future designs, model acceptability and internal validity indices may be improved by utilizing post intervention ratings instead of change scores – particularly if random assignment to treatment conditions is conducted (Linn & Slinde, 1977) – by removing insignificant predictors, and by including latent variable predictors related to symptoms of anxiety and depression that were explicitly taught in the preventive mental health course. Examples of prospective, more

meaningful constructs that may be explored include mindfulness, values clarification, committed action, distress tolerance, cognitive restructuring, gratitude, emotion regulation, and interpersonal effectiveness.

It is also important to note that the use of multiple linear regression does not allow for causal conclusions. Although focal predictors may significantly contribute to the unique variance of an outcome variable, those predictors do not necessarily cause change in the dependent variable (Tabachnick & Fidell, 2013). Because this study does not utilize an experimental design and there was no random assignment, findings must be interpreted with caution. The effects of the intervention cannot be tested. Especially because there is a dearth of literature related to this specific topic, conducting a well-designed randomized control trial is imperative to exploring student outcomes and prevention efficacy. According to the Collaborative for Academic, Social, and Emotional Learning (CASEL) institute, inclusion criteria for an evidence-based social emotional preventive mental health curriculum includes at least one carefully conducted evaluation that includes a control comparison group, pre and post intervention measurements and significant main effects (Weissberg et al., 2015). Research claims would be bolstered if students were randomized to enrollment and waitlist control conditions and adequate follow up data at three, six, and 12 months was included in statistical analyses.

Regarding external validity, characteristics of this sample are unlikely to be representative of the larger population due to the high rate of female and freshman respondents. Population validity is threatened due to the non-probability sampling methods. Additionally, the context of students sampled who were enrolled in this specific preventive mental health course further limits the external validity. While findings from this study may be generalized to other students with similar demographic presentations who have also enrolled in and completed this

preventive course during another academic quarter, findings are not applicable to demographically divergent college campuses utilizing a different preventive mental health design. A larger sample size may bolster, in part, the external validity.

Lastly, it is unknown if there are truly no differences across student groups and demographic factors. To align programming with APA standards of cultural responsiveness (Clauss-Ehlers et al., 2019) and literature related to identity-affirming learning (Hammond, 2015), intervention acceptability assessments with student participants may affirm current practices or yield necessary intervention adjustment considerations. Future research may aim to answer what are students' experiences of the course as it relates to skill enhancing versus skill deficit assumptions (Yosso, 2005) the presence or absence of racial and ethnic affirming curriculum factors (Jones et al., 2018) and asset-oriented learning experiences in class (Hammond, 2015; Jones et al., 2018).

Implications for Practice

The results of the current study support claims that college students may benefit from preventive mental health programming offered as part of a universal, 10-week intervention delivered on a predominantly white, large, urban, public university.

College Campus Mental Health Service Reform

Lessons related to the reform of mental health service delivery can be drawn from the present study. From a public health or MTSS perspective, schools are an ideal environment for tiered, mental health supports (Kilgus et al., 2015). Because the college student participants demonstrated significant decreases in anxiety and depression symptoms, continued implementation and expansion of the universal preventive mental health class would complement preexisting counseling therapy services and may offer reprieve to long waiting lists

for tertiary care (Brunner et al., 2017). If future research further substantiates the efficacy of the abovementioned Tier-I prevention course and an MTSS framework is implemented with fidelity, approximately 80% of undergraduate students will have their needs met through this type of universal programming (McIntosh & Goodman, 2016) and will not require more advanced care (August et al., 2018). There is an opportunity to get "upstream" before the mental health problems begin and to provide preventive care to students by fostering resilience and enhancing psychological health. Furthermore, preventing mental illness may be an effective suicide prevention method on college campuses (CDC, 2018; Mortier et al., 2018). This is consistent with Greenberg and colleagues' application of the "Prevention Paradox" (Rose, 1985) within the social emotional learning and school-based contexts, whereby the benefit to individual students may be small, but the cumulative benefit to the population is remarkable and significant (Greenberg et al., 2017)

Filling the Higher Education SEL Curriculum Gap

There is a dearth of research related to effective programming utilizing evidence-based interventions and evidence-based behavior change tools to decrease mental health issues plaguing a large portion of university students (Blueprints for Healthy Youth Development, 2020; Weissberg et al., 2015). Because intervention fidelity and implementation protocols are cited as central barriers inhibiting effective mental health service delivery within a public health framework (Reinke et al., 2012), this 10-week, highly structured and well-documented intervention may offer a plausible curriculum for other universities to adopt especially now that there is preliminary evidence to suggest decreases in anxiety and depression symptoms. This is significant because anxiety and depression are the most predominant mental health issues

experienced among college students (LeViness et al., 2019; Lipson et al., 2019b; Xiao et al., 2017), while rates of depression, specifically, are increasing (Mojtabai et al., 2016).

Stress as Enhancing Explicit Instruction

Stress in college is a unique predictor of internalizing mental health issues including depression (Vrshek-Schalhorn et al., 2015) and anxiety (Jones et al., 2018). The results from this study indicate the interaction of pre-intervention stress mindsets and pre-intervention anxiety and predict depression symptom changes. Because stress mindsets are not fixed and can be shifted through brief intervention (Crum et al., 2017; Jamieson et al., 2018; Park & Hahm, 2018), these findings suggest that an explicit stress as enhancing intervention could enhance prevention outcomes. It is unknown, however, if changes in stress mindset (compared to the student's attitude about stress prior to the intervention) may also predict improvements in depression or anxiety symptoms. Therefore, if students could explicitly learn about stress-as-enhancing mindsets, mental health outcomes could be improved. Although the current curriculum teaches students about stress, stressors, and relationship between life events, individual choices, and genetics on happiness, modifying the curricula to include explicit stress-as-enhancing mindset instruction may give students an extra tool to add to their "resilience toolbox." This could enhance student outcomes.

Stress Mindset and Sociocultural Attunement

A push to perceive stress as "enhancing," in the broader context of systemic racism and social injustice, however, may be invalidating and reinforcing of systemic issues that uphold oppression (Ahsan, 2020). Of note, equitable SEL programs are, arguably, those that foster sense of self among young persons, uphold students' cultural values, (Yosso, 2005) and promote critical consciousness (Diemer et al., 2017; Garriott, 2020) of the students it aims to serve.

Therefore, how stress mindset is taught to students must be conducted with the upmost sociocultural attunement, while follow up acceptability studies may clarify how this intervention is perceived and utilized.

Effective Modalities and Modes

Consistent with Conley and colleague's (2015) meta-analysis reviewing higher education mental health promotion and prevention programming, the interventions used in this study, including mindfulness and DBT skills, further substantiates that these modalities may be particularly effective in promoting positive mental health and decreasing the likelihood of mental health issues among students in higher education settings (Cavanagh et al., 2018; Cheng & Merrick, 2017; Conley et al, 2013; Parcover et al., 2018). This helps clarify what specific interventions may be beneficial among this unique and understudied student population. Furthermore, this research adds to the literature suggesting that prevention elements such as skill instruction, skill coaching and for-credit course structures may be effective in reducing symptoms of psychopathology among college students specifically (Coley et al., 2015). This study further substantiates these claims. It is promising that the modalities and skills used as part of this intervention package, in addition to the treatment modes may begin to fill the research gap and offer concrete programming solutions for universities who also wish to meet the mental health needs of their students more equitably, cost-effectively, and efficiently.

Conclusion

College is extremely stressful for some college students (ACHA, 2019; Betier et al., 2015; Nash et al., 2017). High stress, paired with stress-as-debilitating mindsets or a lack of effective coping can negatively impact college student outcomes (Bayram & Bilgel, 2008; Deci & Ryan, 2000). With more than one third of college students meeting the diagnostic criteria for a

mental health disorder (Auerbach et al., 2018; Lipson et al., 2019b), most notably depression and anxiety (Xiao et al., 2017), encouraging universities to provide preventive mental health programming (Conley et al., 2012; Schiraldi et al., 1998) is a potentially effective strategy amidst this college mental health epidemic.

The present study is the first known study to examine the relationship of students' self-report ratings of anxiety, depression, attitudes about stress, in addition to demographic factors to changes in self-report ratings of anxiety and depression within the context of a preventive mental health intervention that teaches DBT, ACT, and Positive Psychology skills to college students. Future research may also further investigate intervention acceptability experienced by students, particularly students who identify as not of European American decent, and to explore other latent variable factors to better predict internalizing symptom change. Results of the present study are consistent with emerging literature on stress mindset which may have an interacting effect with stress-related constructs on depression.

It is affirming that participation in the EDUC 215 may be associated with decreasing symptomology at the universal level and relatedly, potentially preventing the development of significant psychopathology by equipping students with skills for the future. It is of the upmost importance that interventions like EDUC 215 Resilience and Wellness in College and Beyond continue to be investigated, manualized, and disseminated to enhance the quality of life for students enrolled in university. With continued support and research, preventive interventions like this course may effectively attenuate the mental health crisis on college campuses and help our future generations thrive.

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Table 1

Behavior Change Techniques and Course Components

BCT	Description	Target Behavior(s)	Frequency	Duration
1. Social support	Designated small groups	Peer accountability; instrumental support	1x/week	7 weeks
2. Psychoeducation	Provision of materials and information	Rationale	2x/week	10 weeks
3. Scheduled time	Supervised intervention times (e.g. class)	Committed action	2x/week	10 weeks
4. Self-monitoring	Skill use reflection and tracking	Progress monitoring and goal evaluation	1x/day	10 weeks
5. Individual intervention	Individualization of content	Intervention acceptability	Ongoing	10 weeks
6. Written feedback	Personalized corrective feedback	Intervention efficacy	2x/week	10 weeks
7. Goal setting	Student driven SMART goal development	Clear behavioral objectives; committed action	1x/week	10 weeks
8. Prompt intention	State commitment to a new behavior	Committed action	1x/week	10 weeks
9. Prompt obstacles	Identify obstacles and establish plan	Planned, actionable contingency plans	1x/week	9 weeks
10. Goal review	Reflect on progress towards goals	Ecological acceptability; behavior modification	1x/week	9 weeks
11. Skill instruction	Direct, explicit skill instruction	Preparation; intervention fidelity	2x/week	10 weeks
12. Skill modeling	Model skill use via role play	Self-efficacy; content understanding	1x/week	10 weeks
13. Skill coaching	In vivo coaching	Skill practice; intervention fidelity	1x/week	10 weeks
14. Skill rehearsal	Peer role play	Rehearsal and repetition	1x/week	10 weeks
15. Reflection	Reflective journal entries	Personalization; ecological validity	1x/week	10 weeks
16. Graded assignments	Diary cards; reflections; participation	Positive reinforcement; engagement	4x/week	10 weeks
17. Specific labeled praise	Encouragement independent of mastery	Sustained effort	3x/week	10 weeks
18. Relapse prevention	Develop plan; reflect on growth, set goals	Skill maintenance	2x	2 weeks

Table 2

Intervention Package Overview

Week	Topic	Skill(s) and/or Primary Intervention
1	Dual Factor Model of Mental Health; stress; resilience	Psychoeducation on stressors and stress perception; mindfulness
2	Mindfulness	Wise mind; DBT what skills: observe, describe, participate; DBT how skills: non-judgmental, one-mindful, and effective
3	Values and goals, committed action	Values identification; SMART goal setting
4	Willpower and distress tolerance	TIPP, ACCEPTS, pros & cons, willpower
5	Negative attention bias & gratitude	Turning the mind, radical acceptance, willingness, positive self-talk, gratitude interventions
6	Cognitive distortions and cognitive restructuring	Cognitive restructuring, mindfulness of current thoughts
7	Emotion regulation	Check the facts, opposite action, wave skill, psychoeducation on the model of emotions
8	Interpersonal effectiveness skills	DEARMAN, GIVE, FAST, psychoeducation on differential sources of support
9	Therapeutic lifestyle changes, vulnerability factors	TLCs/REFRESHERs
10	Review, future-oriented committed action	Relapse prevention planning

Table 3

Glossary of Skills and Primary Authors

Skill	Definition	Primary Author(s)
Wise mind	Balance between emotion mind and reasonable mind	Linehan (2014)
Observe	Noticing experience of the present moment using five senses without labeling	Linehan (2014)
Describe	Putting words to the experience	Linehan (2014)
Participate	Throwing yourself completely into the present moment	Linehan (2014)
Non-judgmentally	Experiencing and noticing without evaluating by sticking to "just the facts"	Linehan (2014)
One-mindfully	Being completely present in the moment	Linehan (2014)
Effectively	Focusing on doing what works for you	Linehan (2014)
Mindfulness	Paying attention, on purpose, in the present moment, without judging	Kabat-Zinn (2003), Linehan (2014)
TIPP	Distress tolerance skill: using temperature, intense exercise, progressive muscle relaxation, and/or paced breathing to not make the situation worse	Linehan (2014)
ACCEPTS	Distress tolerance skill: using activities, contributing, comparing, cultivating different emotions, pushing away, replacements thoughts, and/or sensations to not make the situation worse	Linehan (2014)
Pros and Cons	Distress tolerance skill: evaluating the pros of engaging in an action urge versus not engaging in an action urge; evaluating the cons of engaging in an action urge versus not engaging in an action urge	Linehan (2014)
WOOP	Goal setting, identifying your Wish, anticipated Outcome, potential Obstacles, and Plan for overcoming barriers to achieve the measurable goal	Oettingen (2012)
Willpower	I will, I won't, and I want power, used to leverage finite capacity to engage in values-directed behavior and achieve personal goals	McGonigal (2011)
Values	Clarify personal, core values that support self-authorship and used to guide behavior	Hayes et al. (2012)
Willingness	Allowing the world to be what it is without changing it; acceptance of the current reality	Linehan (2014); Hayes (2012)

Turning the mind	Turning the mind towards acceptance; choosing to deal with pain without avoidance	Linehan (2014)
Mindfulness of current thought	The process of stepping back and noticing your thoughts for what they are (e.g., just thoughts)	Linehan (2014)
Gratitude	Gratitude journaling, thank you notes, letter writing, or visits	Seligman et al. (2005)
Positive self-talk	Positive self-thinking, affirmations, and encouragement	Seligman et al. (2005)
Cognitive restructuring	The process of challenging unhelpful, automatic thoughts and reframing thoughts to be more effective	Beck (1976), Ellis (1962)
Check the facts	Emotion regulation skill: using five senses to step back and assess situation and determine if emotional response is appropriate and proportionate to the situation.	Linehan (2014)
Opposite action	Emotion regulation skill: When your emotion does not fit the facts of the situation, engaging in a behavior that is opposite of the action urge to cultivate new emotions	Linehan (2014)
Wave skill	Mindfulness of current emotion	Linehan (2014)
REFRESHERs	Therapeutic lifestyle changes: Relationships, Exercise, Fun, Relaxation, Eat well, Sufficient sleep, Helping others, Earth, Reason	DeCano (2018), Walsh (2011)
DEARMAN	Interpersonal effectiveness skill:	Linehan (2014)
GIVE	Interpersonal effectiveness skill:	Linehan (2014)
FAST	Review, future-oriented committed action	Linehan (2014)

Table 4

Frequency Tables (Demographic Distribution)

Variable	Attribute	*N*	%
Quiz section group	A	34	15.1
	B	44	19.6
	D	34	15.1
	E	18	8.0
	F	29	12.9
	G	18	8.0
	H	24	10.7
	I	24	10.7
Year of study	Freshmen	107	47.6
	Sophomore	56	24.9
	Junior	30	13.3
	Senior	20	8.9
	Transfer Student	12	5.3
Gender	Male	56	24.8
	Female	169	75.1
International Student	Not an International Student	181	80.4
	International Student	44	19.6
Historically marginalized student status	Not HMS	80	35.6
	HMS	145	64.4

Table 5

Descriptive Statistics

	Min	Max	*M*	*SD*	Skewness	Kurtosis
Zscore: BSI depression change	-1.14	1.29	0.000	0.737	0.152	-0.890
Zscore: BSI anxiety change	-1.24	1.22	0.016	0.733	0.004	-0.743
Zscore: SMM pre total	-1.25	1.44	0.033	0.823	0.081	-0.894
Zscore: BSI anxiety pre total	-1.152	1.529	-0.061	0.867	0.558	-0.923
Zscore: BSI depression pre total	-1.00	1.42	-0.055	0.804	0.501	-1.003
BSI anxiety change	-6.00	5.40	-0.179	3.396	0.004	-0.743
BSI depression change	-5.02	5.00	-0.314	3.044	0.152	-0.889
BSI anxiety pre total	6.00	19.00	11.293	4.203	0.558	-0.923
BSI depression pre total	7.00	18.00	11.291	3.654	0.500	-1.003
SMM pre total	13.00	26.00	19.191	3.976	0.081	-0.893

Table 6

Descriptives and Zero Order Correlations

Measure	*M*	*(SD)*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Outcomes												
1. Anxiety Change	-0.18	(3.40)	--									
2. Depression Change	-0.31	(3.04)	.60 **	--								
Predictors												
3. Freshman	0.48	(0.50)	-.02	.05	--							
4. Female	0.75	(0.43)	.03	-.13	.03	--						
5. International	0.20	(0.39)	.03	.09	.14 *	-0.079	--					
6. HMS	0.64	(0.48)	.02	.13	-.06	-.02	.30 **	--				
7. Quiz Group	0.15	(0.36)	.02	.10	.42 **	-.07	.29 **	.11	--			
8. Anxiety Pre	11.29	(4.20)	-.42 **	-.27 **	-.02	-.10	.02	-.03	-0.13	--		
9. Depression Pre	11.29	(3.65)	-.25 **	-.42 **	-.20 **	.11	-.02	-.02	-.19 **	0.7 **	--	
10. SMM Pre	19.19	(3.98)	.12	.10	.24 **	-.05	-.07	-.04	.17 **	-.23 **	-.33 **	--

Note. N=225. HMS = Historically Marginalized Student Status, SMM = Stress Mindset Measure.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 7

Predicting Change in Anxiety Using Multiple Linear Regression with Sequential Predictor Entry

	Block 1					Block 2					Block 3					Block 4				
	R^2_{Change}	R^2_{Total}	$R^2_{Adjusted}$	*b*	sr^2	R^2_{Change}	R^2_{Total}	$R^2_{Adjusted}$	*b*	sr^2	R^2_{Change}	R^2_{Total}	$R^2_{Adjusted}$	*b*	sr^2	R^2_{Change}	R^2_{Total}	$R^2_{Adjusted}$	*b*	sr^2
Model Fit	0.013	0.013	-0.010			0.191	0.203***	0.178			0.002	0.205***	0.175			0.004	0.209***	0.168		
Coefficients																				
Intercept				0.014					-0.072					-0.084					-0.335	
Freshman				-0.028	0.000				-0.014	0.000				-0.037	0.000				-0.036	0.000
Female				-0.111	0.001				0.052	0.000				0.055	0.000				0.087	0.000
Intl				0.151	0.001				0.235	0.003				0.225	0.002				-0.115	0.000
HMS				0.025	0.000				-0.039	0.000				-0.030	0.000				0.188	0.000
Quiz Group				0.348	0.010				0.510*	0.021				0.525*	0.022				0.514*	0.021
Anxiety Pre									-1.874***	0.113				-1.866***	0.112				-1.836***	0.107
Depression Pre									0.233	0.001				0.278	0.002				0.261	0.002
Stress Mindset Pre										0.000				0.175	0.002				0.173	0.001
Female*Intl															0.000				0.177	0.001
Intl*HMS																			0.318	0.001
Female*HMS																			0.099	0.000

Note. *N*=225. Block 1 F-change test *df*=5,219; Block 2 *df*=7,217; Block 3 *df*=8,216; Block 4 *df*=11,213. Intl = International student; HMS = Historically marginalized student; Anxiety Pre = Pre-intervention anxiety score; Depression Pre = Pre-intervention depression score; Stress Mindset Pre = Pre-intervention stress mindset score. The categorical variables have been effect coded, ordinal variables are standardized.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 8

Predicting Change in Depression Using Multiple Linear Regression with Sequential Predictor Entry

	Block 1					Block 2					Block 3					Block 4				
	R^2_{Change}	R^2_{Total}	$R^2_{Adjusted}$	*b*	sr^2	R^2_{Change}	R^2_{Total}	$R^2_{Adjusted}$	*b*	sr^2	R^2_{Change}	R^2_{Total}	$R^2_{Adjusted}$	*b*	sr^2	R^2_{Change}	R^2_{Total}	$R^2_{Adjusted}$	*b*	sr^2
Model Fit	0.039	0.038***	0.017			0.169	0.207***	0.182			0.001	0.208***	0.179			0.007	0.215***	0.175		
Coefficients																				
Intercept				-0.086					-0.201					-0.194					0.017	
Freshman				0.191	0.004				-0.067	0.000				-0.053	0.000				-0.016	0.000
Female				-0.447	0.016				-0.271	0.006				-0.273	0.006				0.003	0.000
Intl				0.140	0.001				0.188	0.002				0.194	0.002				0.326	0.002
HMS				0.372	0.012				0.330	0.010				0.324	0.009				0.021	0.000
Quiz Group				0.106	0.001				0.300	0.009				0.291	0.008				0.301	0.009
Anxiety Pre									0.210	0.002				0.206	0.002				0.258	0.003
Depression Pre									-1.774***	0.103				-1.799***	0.102				-1.819***	0.103
Stress Mindset Pre														-0.103	0.001				-0.116	0.001
Female*Intl																			0.414	0.007
Intl*HMS																			-0.349	0.002
Female*HMS																			-0.070	0.000

Note. N=225. Block 1 F-change test df=5,219; Block 2 df=7,217; Block 3 df=8,216; Block 4 df=11,213. Intl = International student; HMS = Historically marginalized student; Anxiety Pre = Pre-intervention anxiety score; Depression Pre = Pre-intervention depression score; Stress Mindset Pre = Pre-intervention stress mindset score. The categorical variables have been effect coded, ordinal variables are standardized.
*p < .05, **p < .01, ***p <.001.

Table 9

Testing Moderating Effects of Stress Mindset and Pre-Intervention Internalizing Symptoms on Anxiety Symptom Change

	Block 1					Block 2					Block 3					Block 4					Block 5				
	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2
Model Fit	0.013	0.013	-0.010			0.191	0.203***	0.178			0.002	0.205***	0.175			0.004	0.209***	0.168			0.018457	0.228***	0.180005		
Coefficients																									
Intercept				0.014					-0.072					-0.084					-0.335					-0.207	
Freshman				-0.028	0.000				-0.014	0.000				-0.037	0.000				-0.036	0.000				-0.071	0.000
Female				-0.111	0.001				0.052	0.000				0.055	0.000				0.087	0.000				0.067	0.000
Intl				0.151	0.001				0.235	0.003				0.225	0.002				-0.115	0.000				-0.110	0.000
HMS				0.025	0.000				-0.039	0.000				-0.030	0.000				0.188	0.000				0.173	0.000
Group				0.348	0.010				0.510*	0.021				0.525*	0.022				0.514*	0.021				0.472*	0.017
Anxiety Pre									-1.874***	0.113				-1.867***	0.112				-1.836***	0.107				-1.782***	0.099
Depression Pre									0.233	0.001				0.278	0.002				0.261	0.002				0.203	0.001
Stress Mindset Pre														0.175	0.002				0.173	0.001				0.242	0.003
Female*Intl																			0.177	0.001				0.213	0.002
Intl*HMS																			0.318	0.001				0.312	0.001
Female*HMS																			0.099	0.000				0.130	0.001
Stress Mindset Pre * Anxiety Pre																								0.711	0.010
Stress Mindset Pre * Depression Pre																								-0.032	0.000

Note. *N*=225. Block 1 F-change test *df*=5,219; Block 2 *df*=7,217; Block 3 *df*=8,216; Block 4 *df*=11,213; Block 5 df=13,213. Intl = International student; HMS = Historically marginalized student; Anxiety Pre = Pre-intervention anxiety score; Depression Pre = Pre-intervention depression score; Stress Mindset Pre = Pre-intervention stress mindset score. The categorical variables have been effect coded, ordinal variables are standardized.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 10

Testing Moderating Effects of Stress Mindset and Pre-Intervention Internalizing Symptoms on Depression Symptom Change

	Block 1					Block 2					Block 3					Block 4					Block 5				
	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2	R^2 Change	R^2 Total	R^2 Adjusted	*b*	sr^2
Model Fit	0.039	0.039	0.017			0.169	0.207***	0.182			0.001	0.208***	0.179			0.007	0.215***	0.175			0.016133	0.232***	0.184176		
Coefficients																									
Intercept				-0.086					-0.201					-0.194					0.017					0.040	
Freshman				0.191	0.004				-0.067	0.000				-0.053	0.000				-0.016	0.000				-0.032	0.000
Female				-0.447	0.016				-0.271	0.006				-0.273	0.006				0.003	0.000				-0.013	0.000
Intl				0.140	0.001				0.188	0.002				0.194	0.002				0.326	0.002				0.324	0.002
HMS				0.372	0.012				0.330	0.010				0.324	0.009				0.021	0.000				0.016	0.000
Group				0.106	0.001				0.300	0.009				0.291	0.008				0.301	0.009				0.259	0.006
Anxiety Pre									0.210	0.002				0.206	0.002				0.258	0.003				0.332	0.004
Depression Pre									-1.774***	0.103				-1.800***	0.102				-1.819***	0.103				-1.906***	0.110
Stress Mindset Pre														-0.103	0.001				-0.116	0.001				-0.107	0.001
Female*Intl																			0.414	0.007				0.404	0.007
Intl*HMS																			-0.349	0.002				-0.342	0.002
Female*HMS																			-0.070	0.000				-0.049	0.000
Stress Mindset Pre * Anxiety Pre																								0.778*	0.015
Stress Mindset Pre * Depression Pre																								-0.461	0.004

Note. *N*=225. Block 1 F-change test *df*=5,219; Block 2 *df*=7,217; Block 3 *df*=8,216; Block 4 *df*=11,213; Block 5 df=13,213. Intl = International student; HMS = Historically marginalized student; Anxiety Pre = Pre-intervention anxiety score; Depression Pre = Pre-intervention depression score; Stress Mindset Pre = Pre-intervention stress mindset score. The categorical variables have been effect coded, ordinal variables are standardized.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 11

Depression Change Predicted Probabilities of Low and High Pre-Intervention Anxiety by Low and High Pre-Intervention Stress Mindsets

	Low Pre Anxiety (-1 SD)	High Pre Anxiety (+1 SD)
Low Pre Stress Mindset (-1 SD)	0.593	-0.299
High Pre Stress Mindset (+1 SD)	-1.177	1.043

Figure 1

Sample diary card used for students' daily self-monitoring of skill use and efficacy. Adapted from Linehan (2014).

EDUC 215 Skills Daily Diary Card

Utility and frequency of skills usage: **Name:**_____ **Date started:**___/____/____

0 = Not thought about or used	**4 = Tried, could do it/them but they didn't help**	**NS = Not learned the Skill**
1 = Thought about, not used, didn't want to	**5 = Tried, could use it/them, helped**	
2= Thought about, not used, wanted to	**6 = Didn't think about it, used it/them, didn't help**	
3= Tried but couldn't use it/them	**7 = Didn't think about it, used it/ them, helped**	

Circle Days Practiced *DNU = Did not use or think about*								**Skills** *For each skill you must track how often you used it (circle DNU or every day you practiced on the left) and provide an average rating (write 0-7 in the box to the right).*	Weekly Skills Use Rating / Comments
								MINDFULNESS	
DNU	T	W	Th	F	Sa	Su	M	1. Wise Mind (balance between emotion mind and reasonable mind)	
DNU	T	W	Th	F	Sa	Su	M	2. Observe (just notice the experience) a component of the "What" skills	
DNU	T	W	Th	F	Sa	Su	M	3. Describe (put words on the experience) a component of the "What" skills	
DNU	T	W	Th	F	Sa	Su	M	4. Participate (throw yourself completely into it) a component of the "What" skills	
DNU	T	W	Th	F	Sa	Su	M	5. Non-judgmentally (see but don't evaluate, just the facts) a component of the "How" skills	
DNU	T	W	Th	F	Sa	Su	M	6. One-mindfully (be completely present) a component of the "How" skills	
DNU	T	W	Th	F	Sa	Su	M	7. Effectively (focus on what works) a component of the "How" skills	
								DISTRESS TOLERNACE	
DNU	T	W	Th	F	Sa	Su	M	8. TIPP (Temperature, Intense exercise, Progressive muscle relaxation, Progressive breathing)	
DNU	T	W	Th	F	Sa	Su	M	9. ACCEPTS (Activities, Contribute, Comparisons, Emotion, Pushing away, Thoughts, Sensations	
DNU	T	W	Th	F	Sa	Su	M	11. Pros & Cons	
DNU	T	W	Th	F	Sa	Su	M	12. WOOP	
DNU	T	W	Th	F	Sa	Su	M	13. I will/want/won't power	
DNU	T	W	Th	F	Sa	Su	M	14. Willingness	
DNU	T	W	Th	F	Sa	Su	M	15. Turning the mind	
DNU	T	W	Th	F	Sa	Su	M	16. Mindfulness of current thought	
								EMOTION REGULATION	
DNU	T	W	Th	F	Sa	Su	M	17. Gratitude (journaling, thank you notes, gratitude letter, gratitude visit)	
DNU	T	W	Th	F	Sa	Su	M	18. Positive self-talk	
DNU	T	W	Th	F	Sa	Su	M	19. Cognitive restructuring	
DNU	T	W	Th	F	Sa	Su	M	20. Check the facts	
DNU	T	W	Th	F	Sa	Su	M	21. Opposite action (when your emotion does not fit the facts)	
DNU	T	W	Th	F	Sa	Su	M	22. Wave skill (mindfulness of current emotion)	
DNU	T	W	Th	F	Sa	Su	M	23. REFRESHERs	
								INTERPERSONAL EFFECTIVENESS	
DNU	T	W	Th	F	Sa	Su	M	24. DEAR MAN (Describe, Express, Assert, Reinforce)(Mindful, Appear confident, Negotiate)	
DNU	T	W	Th	F	Sa	Su	M	25. GIVE (be Gentle, act Interested, Validate, use an Easy manner)	
DNU	T	W	Th	F	Sa	Su	M	26. FAST (be Fair, no Apologies, Stick to values, be Truthful)	

Figure 2

Model 1 P-P Plot of Regression Standardized Residual of Anxiety Change

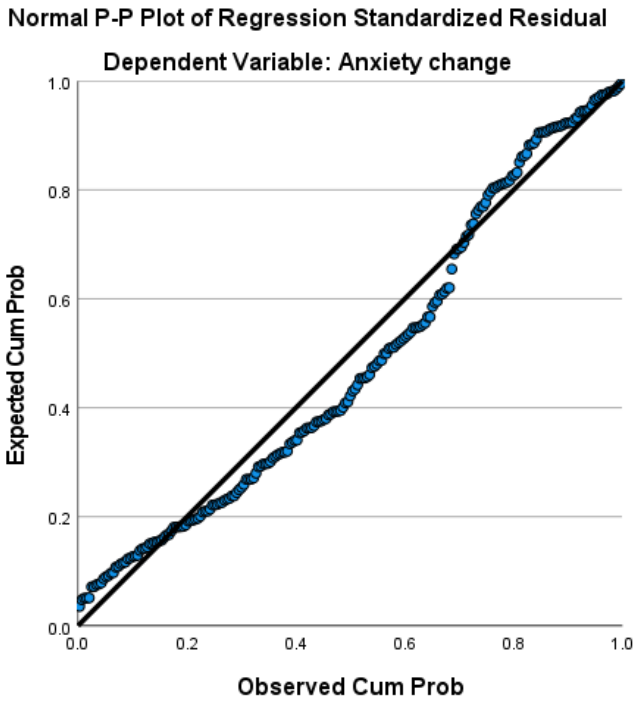

Figure 3

Model 2 P-P Plot of Regression Standardized Residual of Depression Change

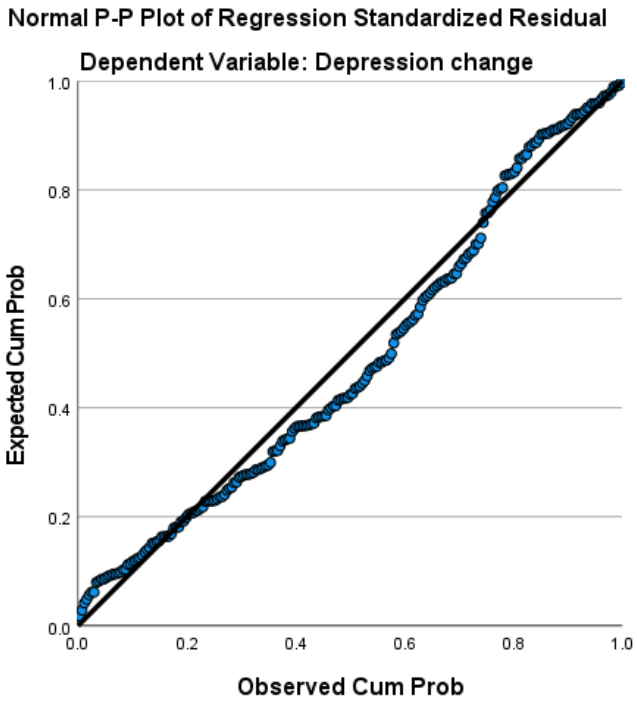

Figure 4

Model 3 P-P Plot of Regression Standardized Residual of Anxiety Change

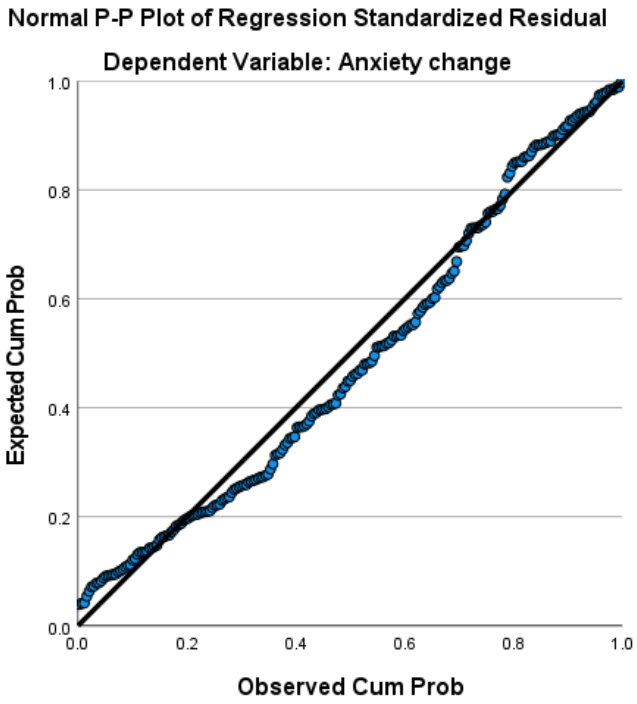

Figure 5

Model 4 P-P Plot of Regression Standardized Residual of Depression Change

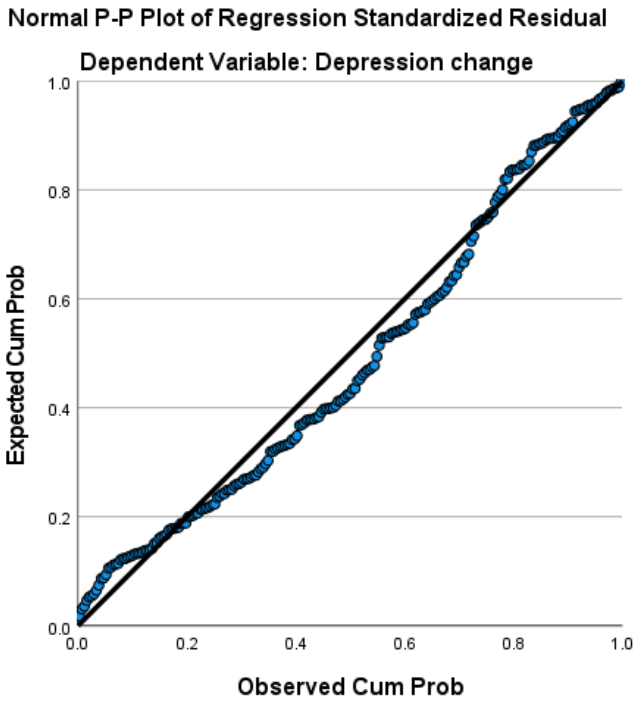

Figure 6

Model 5 P-P Plot of Regression Standardized Residual of Anxiety Change

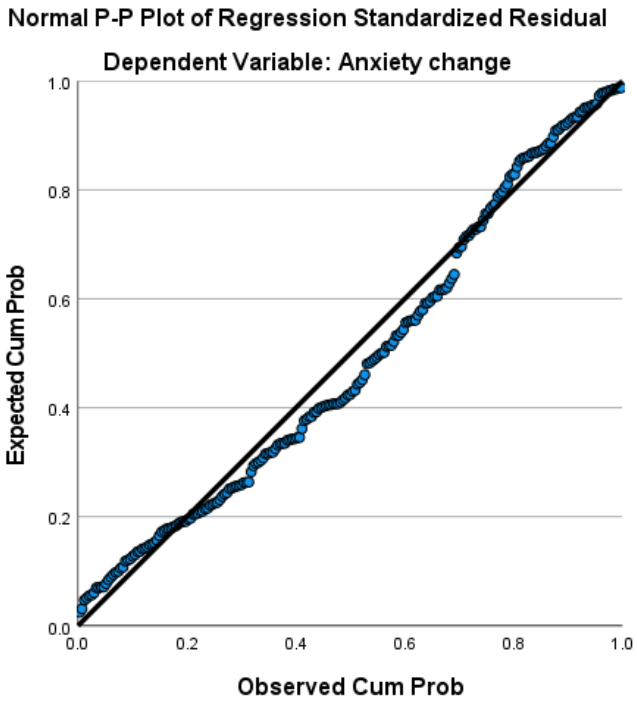

Figure 7

Model 6 P-P Plot of Regression Standardized Residual of Depression Change

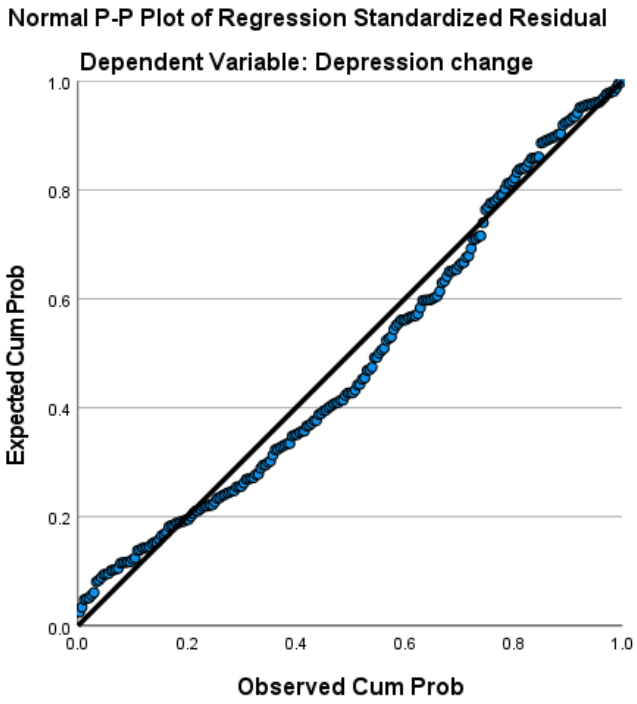

Figure 8

Scatterplot Output from Regression Model 1

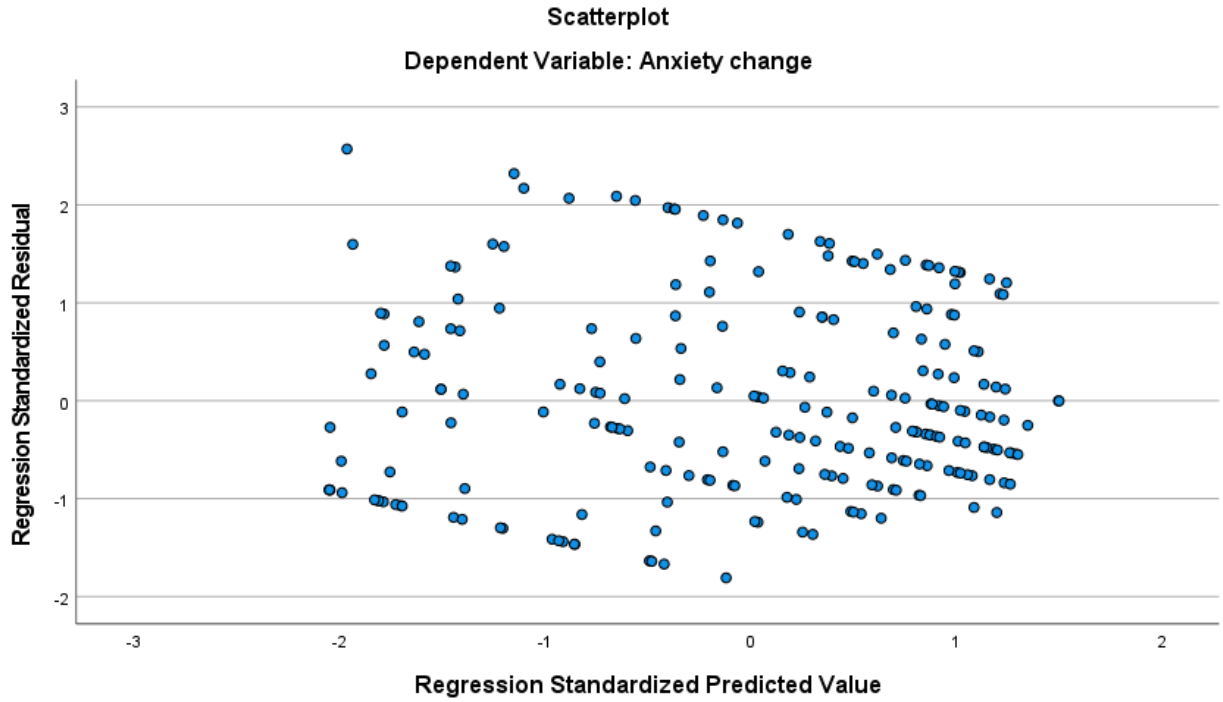

Figure 9

Scatterplot Output from Regression Model 2

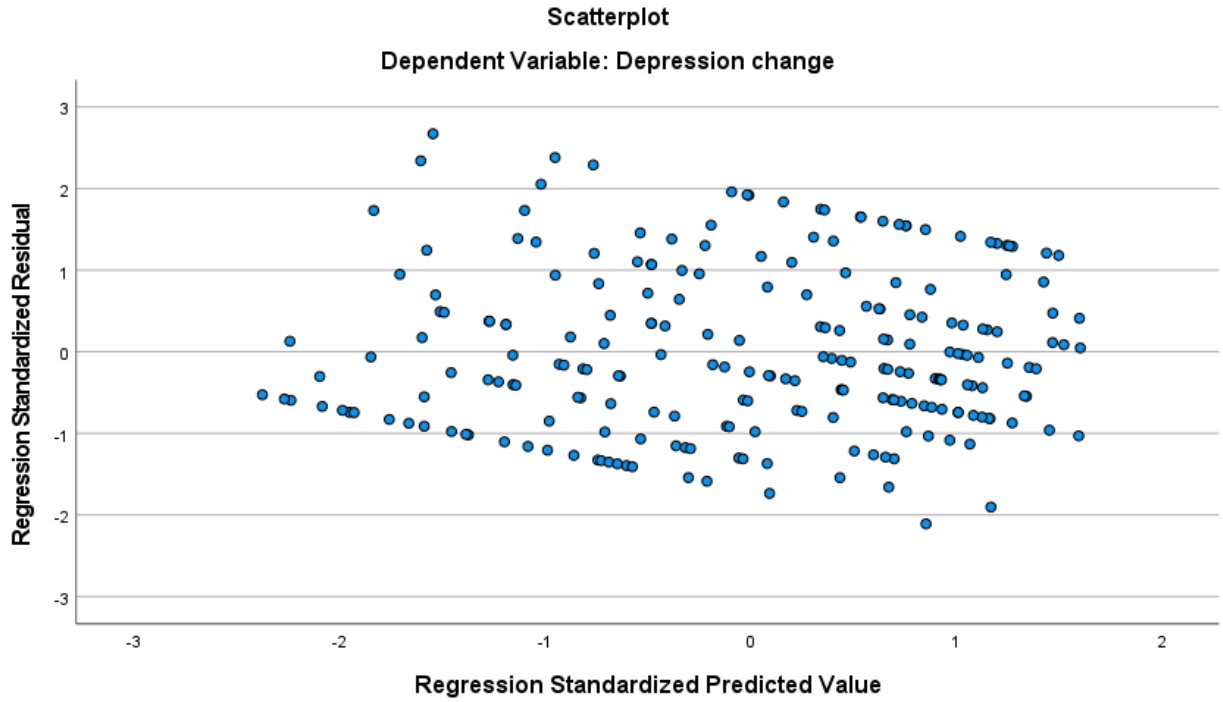

Figure 10

Scatterplot Output from Regression Model 3

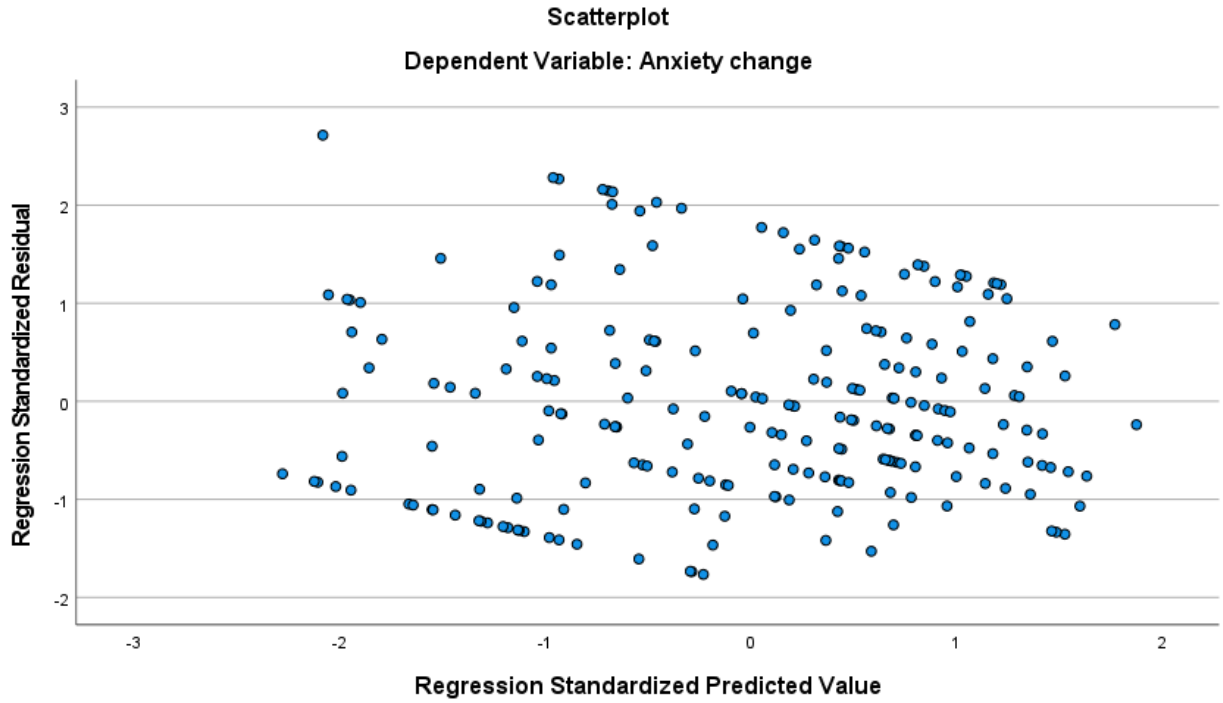

Figure 11

Scatterplot Output from Regression Model 4

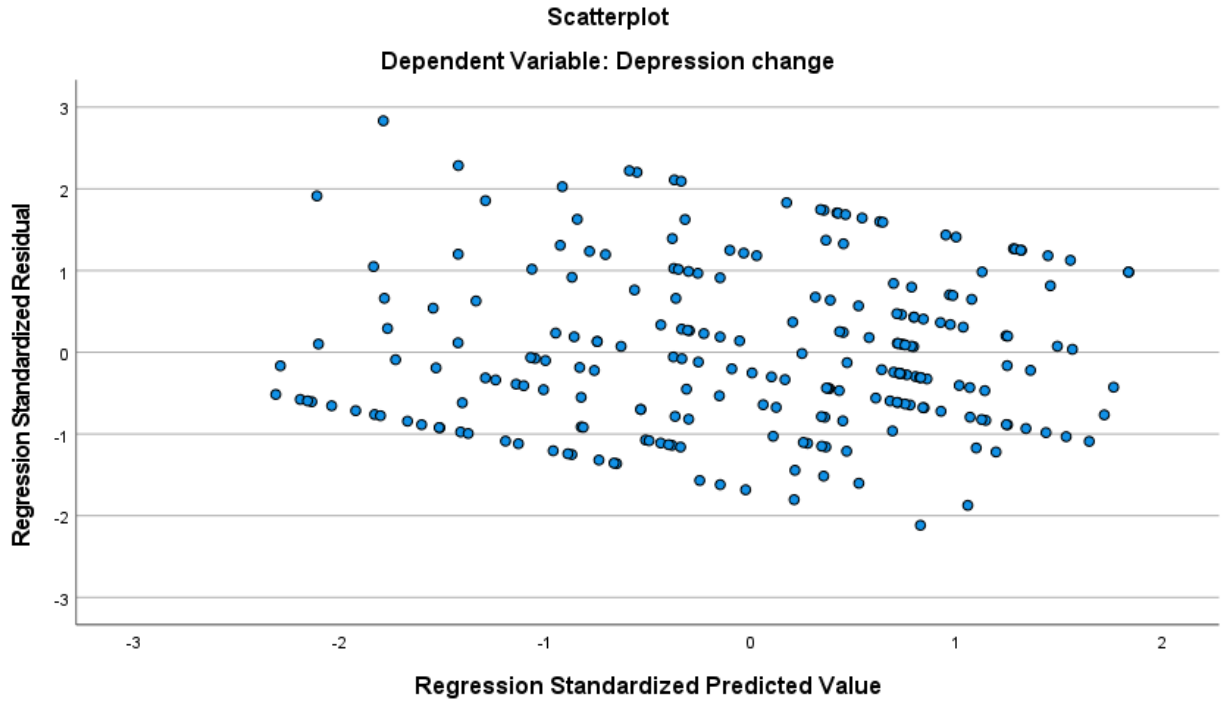

Figure 12

Scatterplot Output from Regression Model 5

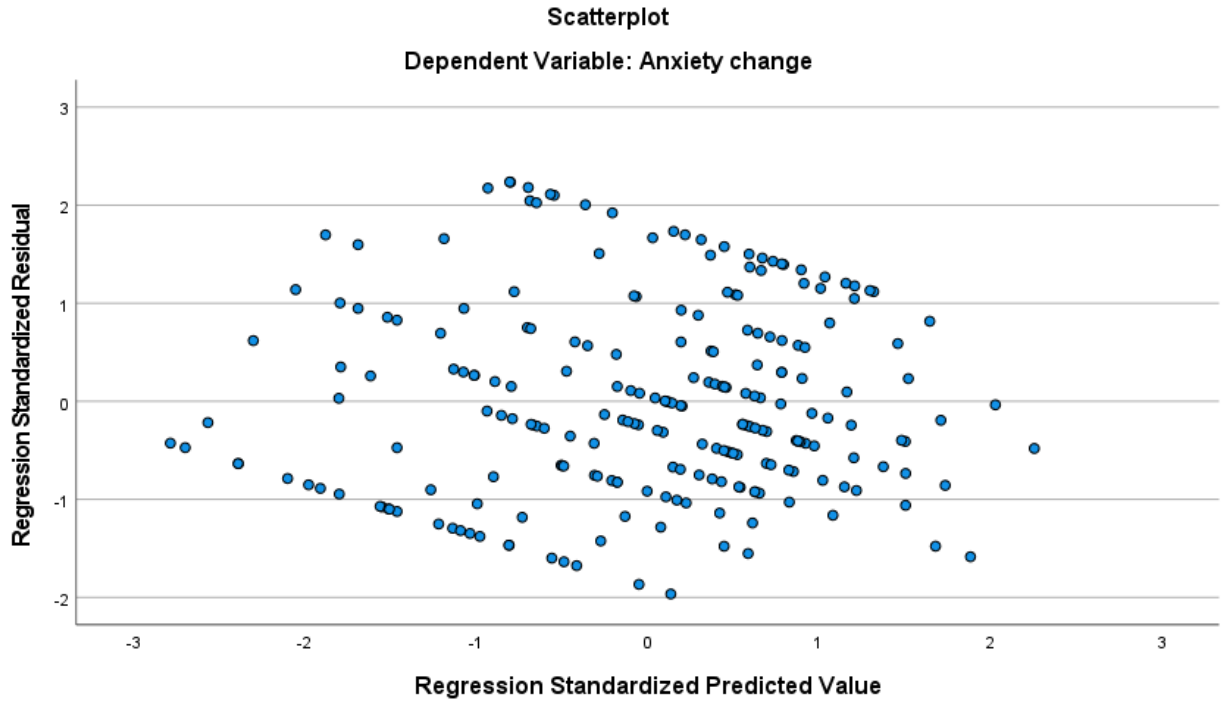

Figure 13

Scatterplot Output from Regression Model 6

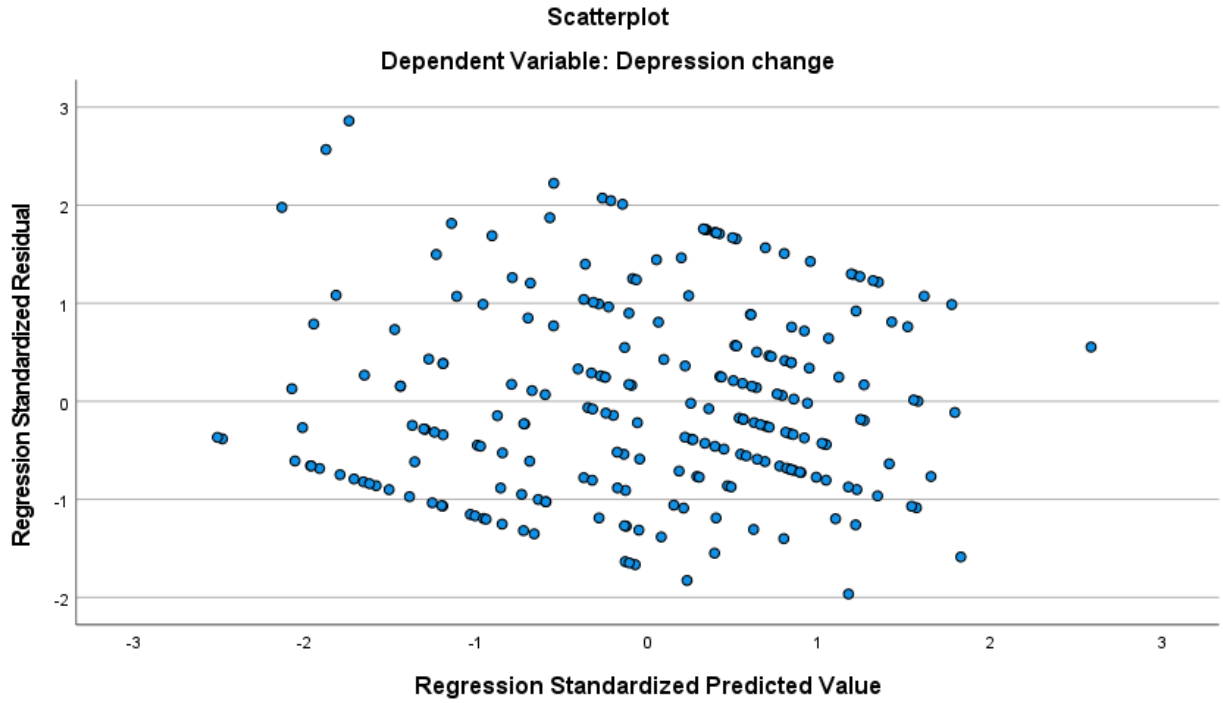

Figure 14

Scatterplot Assessments of Linearity for Regression Model 1 by Pre-Intervention Stress Mindset on Anxiety Change

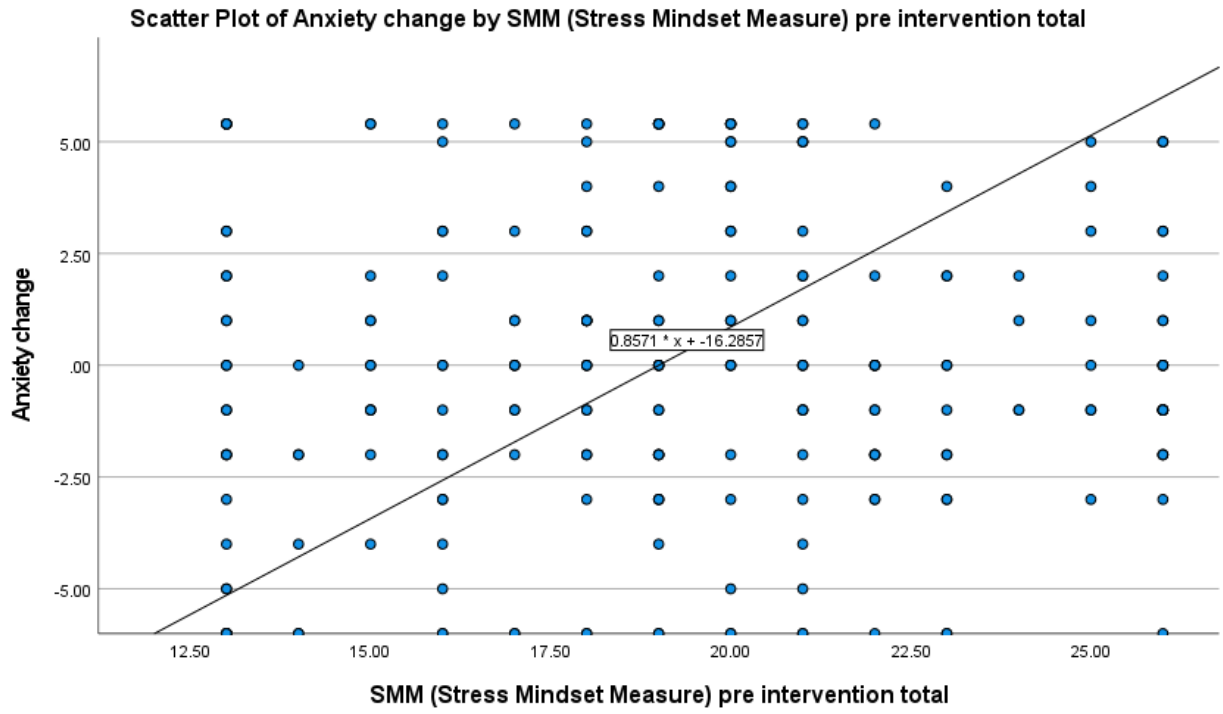

Figure 15

Scatterplot Assessments of Linearity for Regression Model 1 by Pre-Intervention Anxiety on Anxiety Change

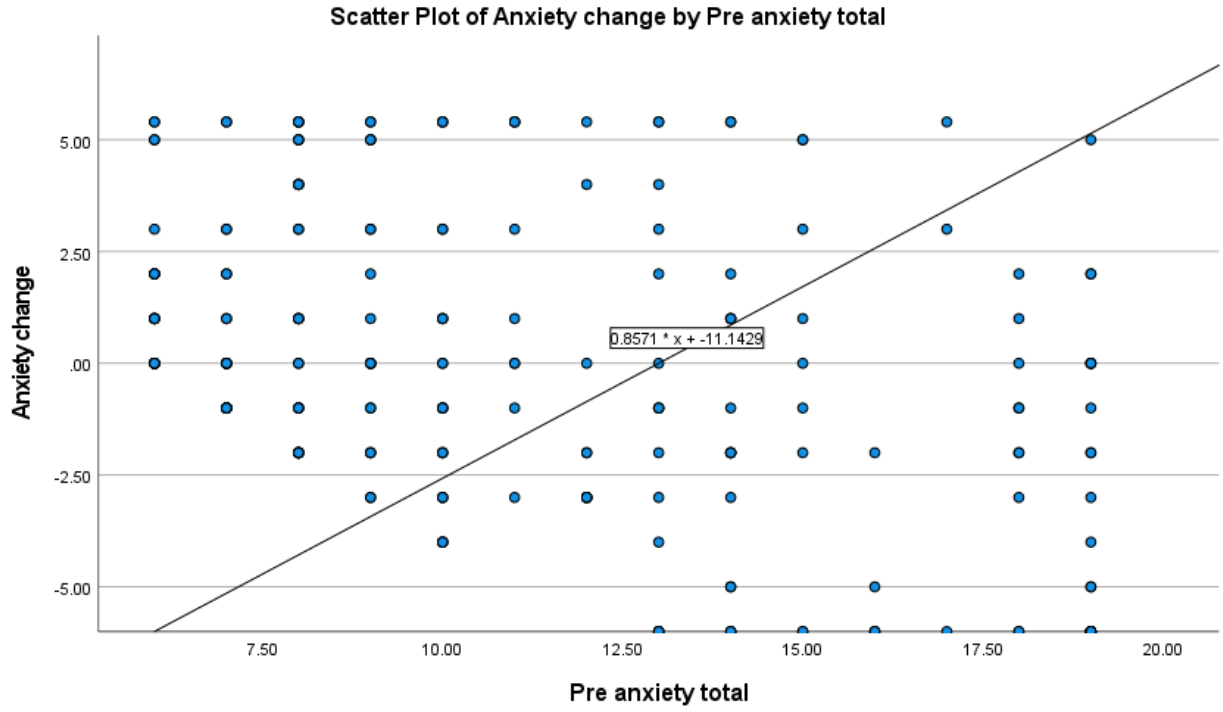

Figure 16

Scatterplot Assessments of Linearity for Regression Model 1 by Pre-Intervention Depression on Anxiety Change

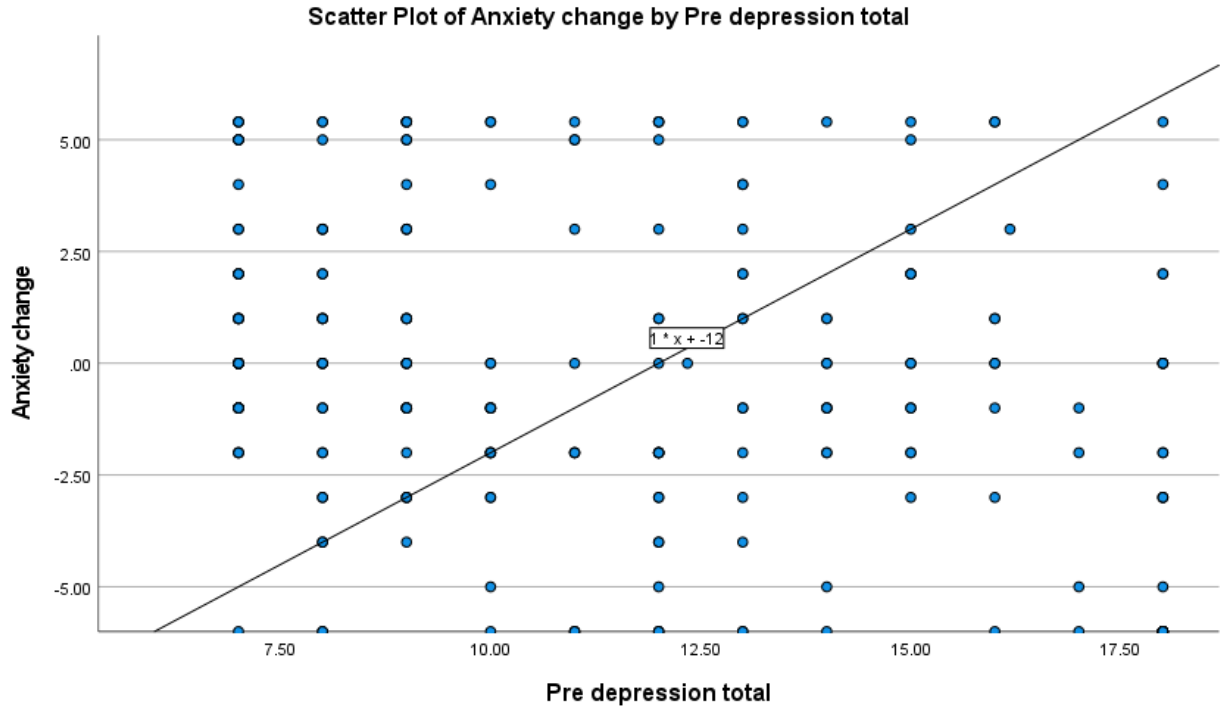

Figure 17

Scatterplot Assessment of Linearity for Regression Model 2 by Pre-Intervention Stress Mindset on Depression Change

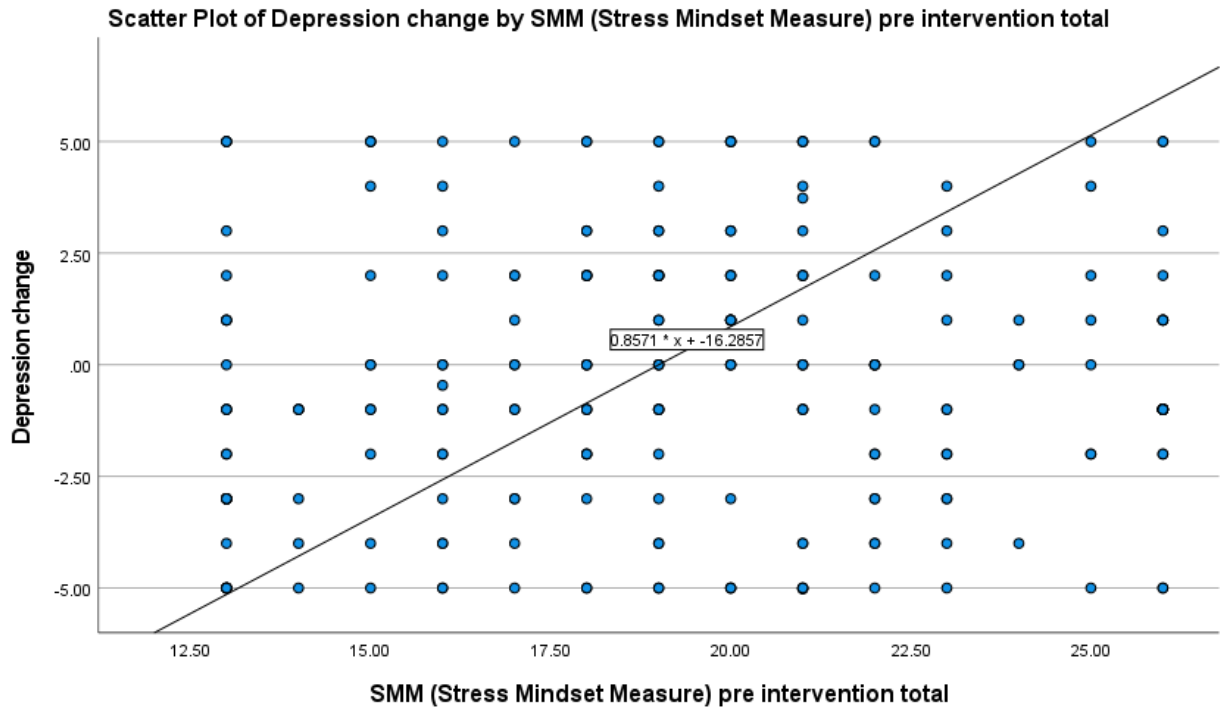

Figure 18

Scatterplot Assessment of Linearity for Regression Model 2 by Pre-Intervention Depression on Depression Change

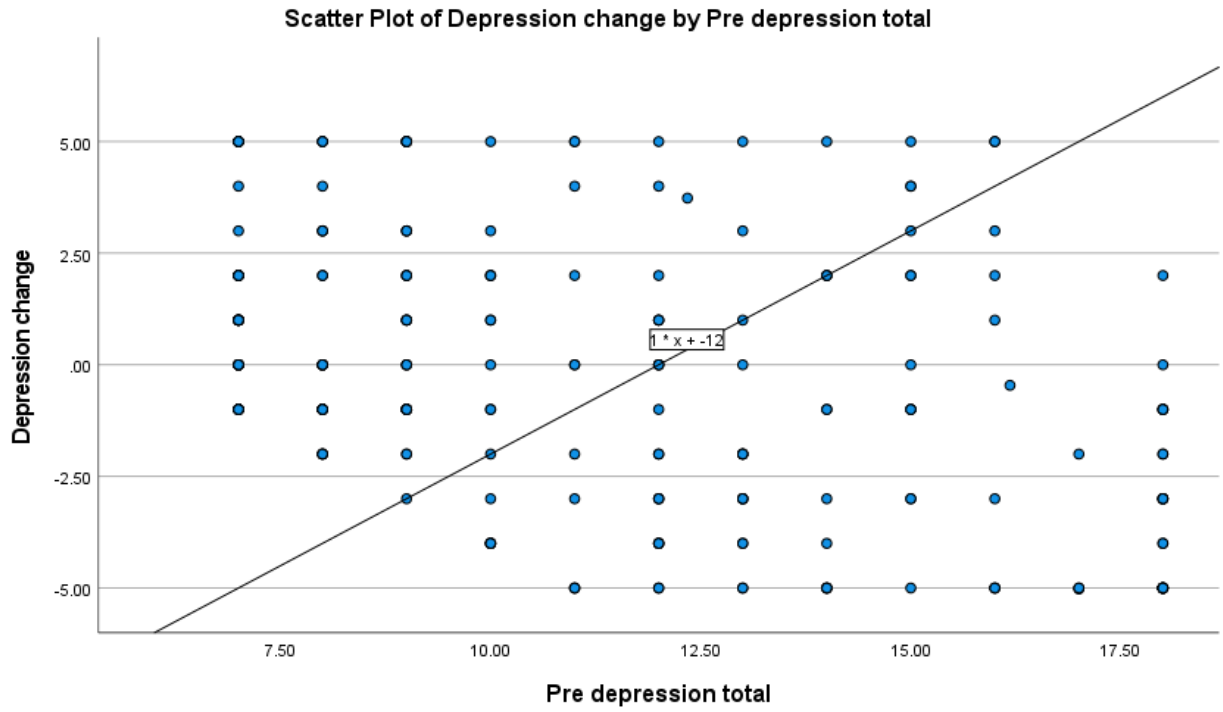

Figure 19

Scatterplot Assessment of Linearity for Regression Model 3 by Pre-Intervention Stress Mindset on Anxiety Change

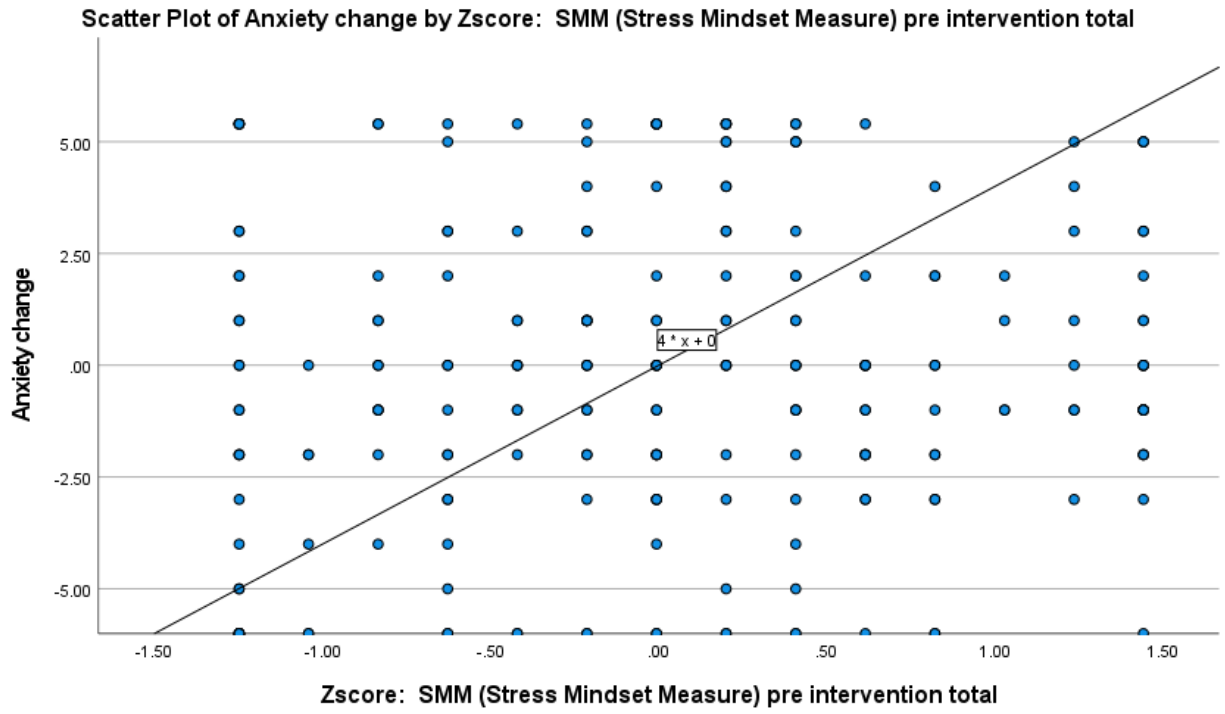

Figure 20

Scatterplot Assessment of Linearity for Regression Model 3 by Pre-Intervention Anxiety on Anxiety Change

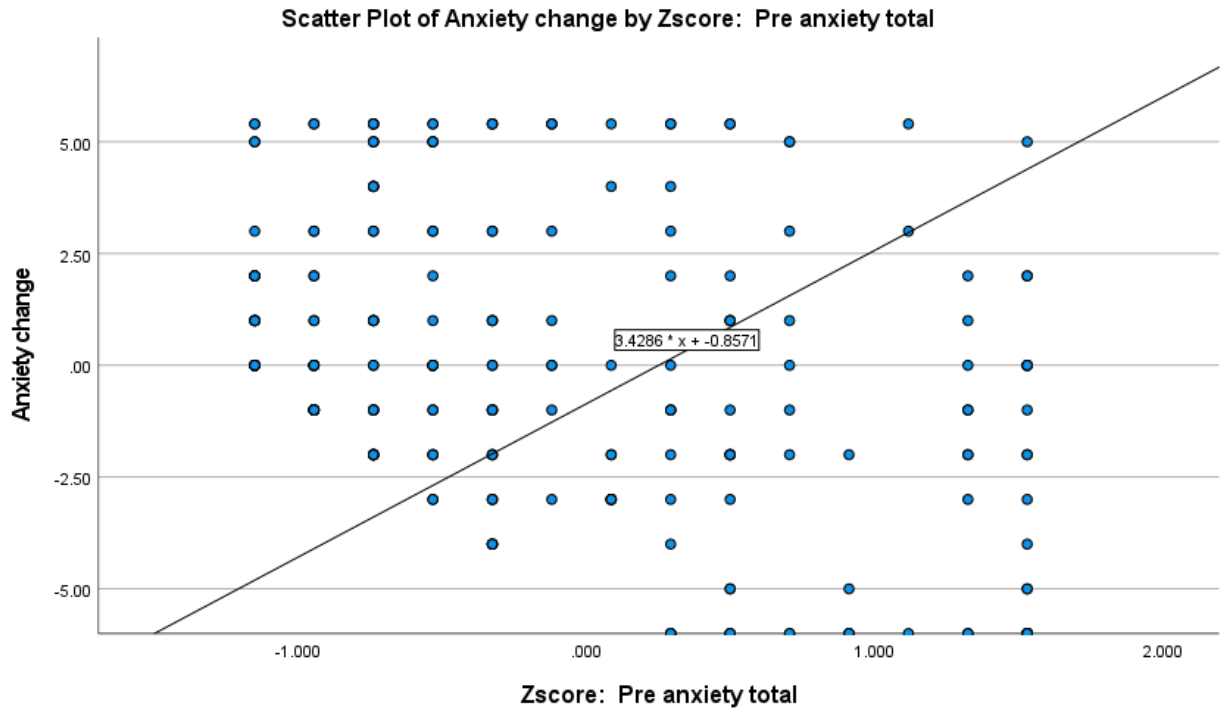

Figure 21

Scatterplot Assessment of Linearity for Regression Model 3 by Pre-Intervention Depression on Anxiety Change

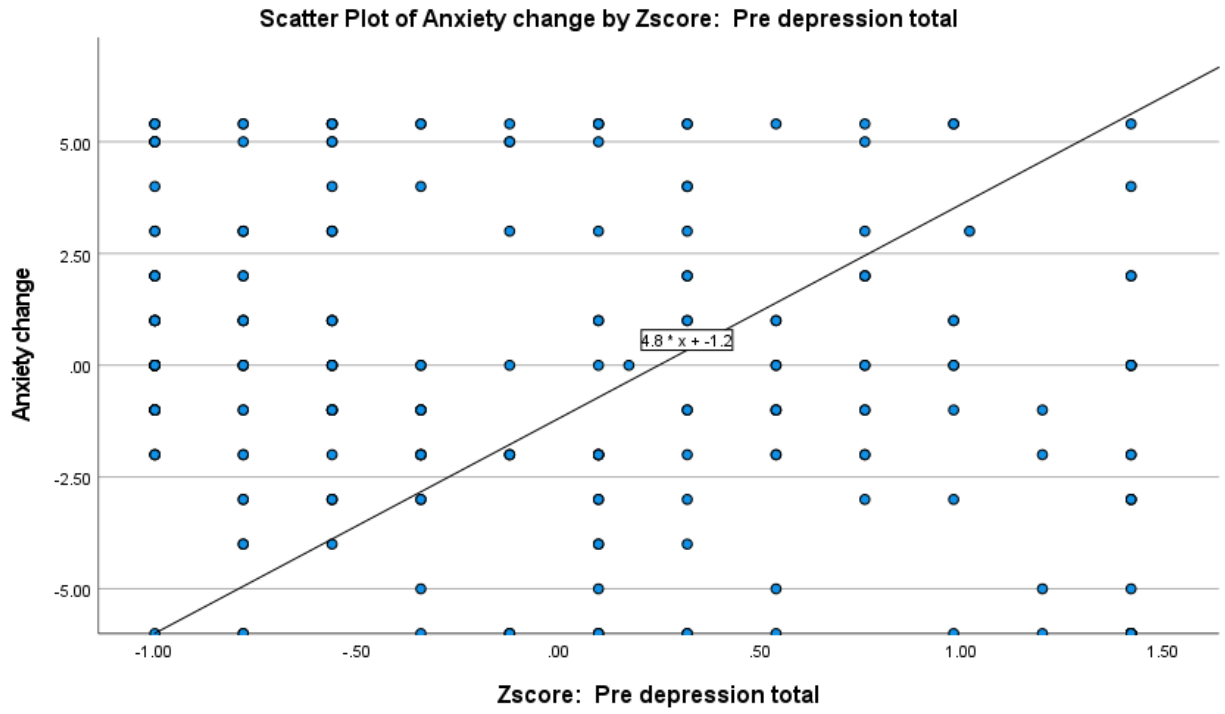

Figure 22

Scatterplot Assessment of Linearity for Regression Model 4 by Pre-Intervention Stress Mindset on Depression Change

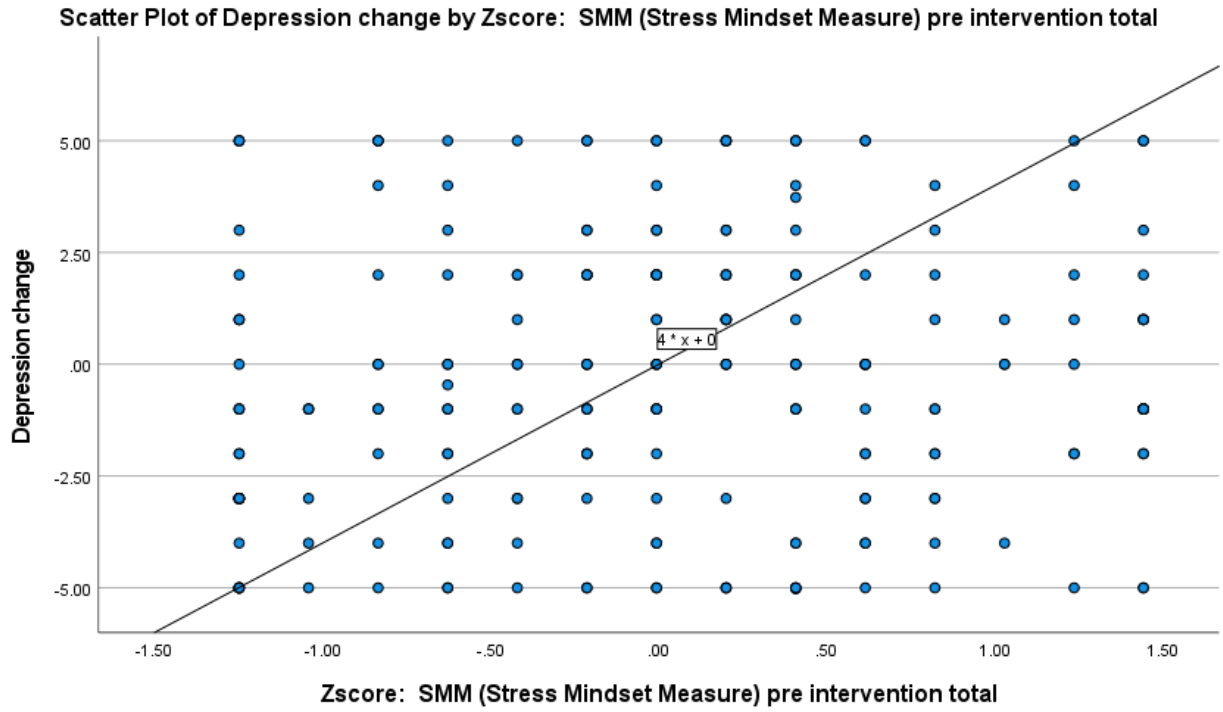

Figure 23

Scatterplot Assessment of Linearity for Regression Model 4 by Pre-Intervention Anxiety on Depression Change

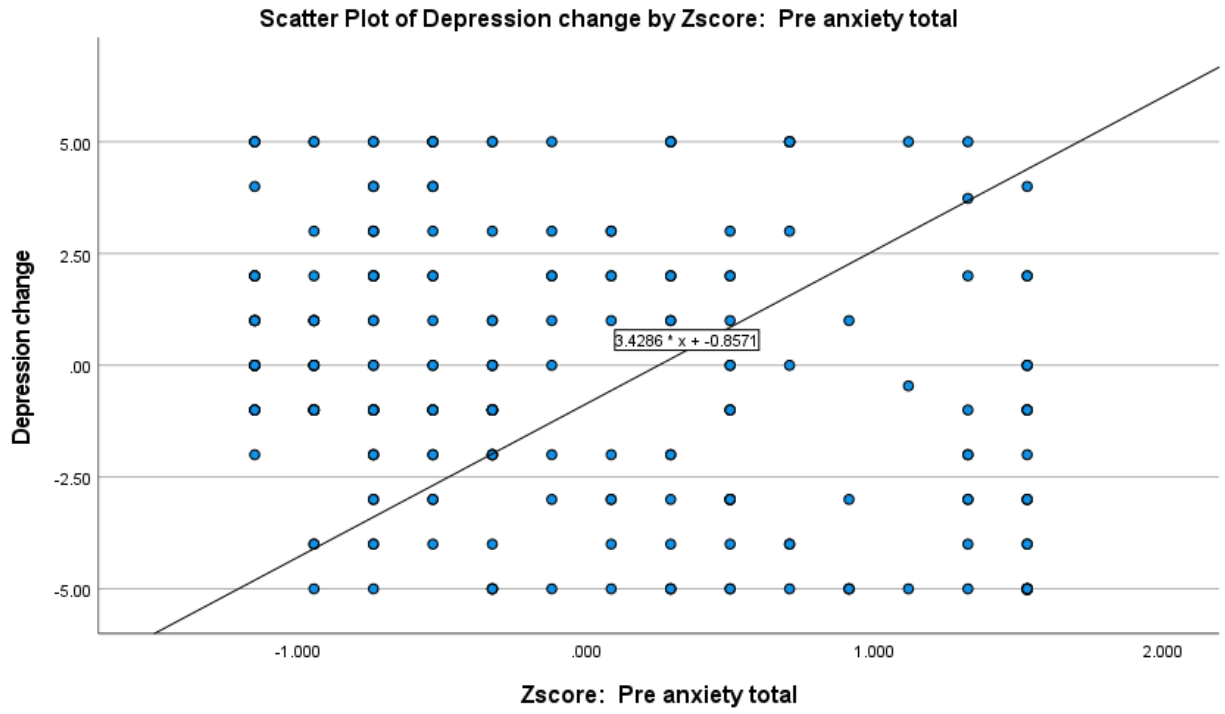

Figure 24

Scatterplot Assessment of Linearity for Regression Model 4 by Pre-Intervention Depression on Depression Change

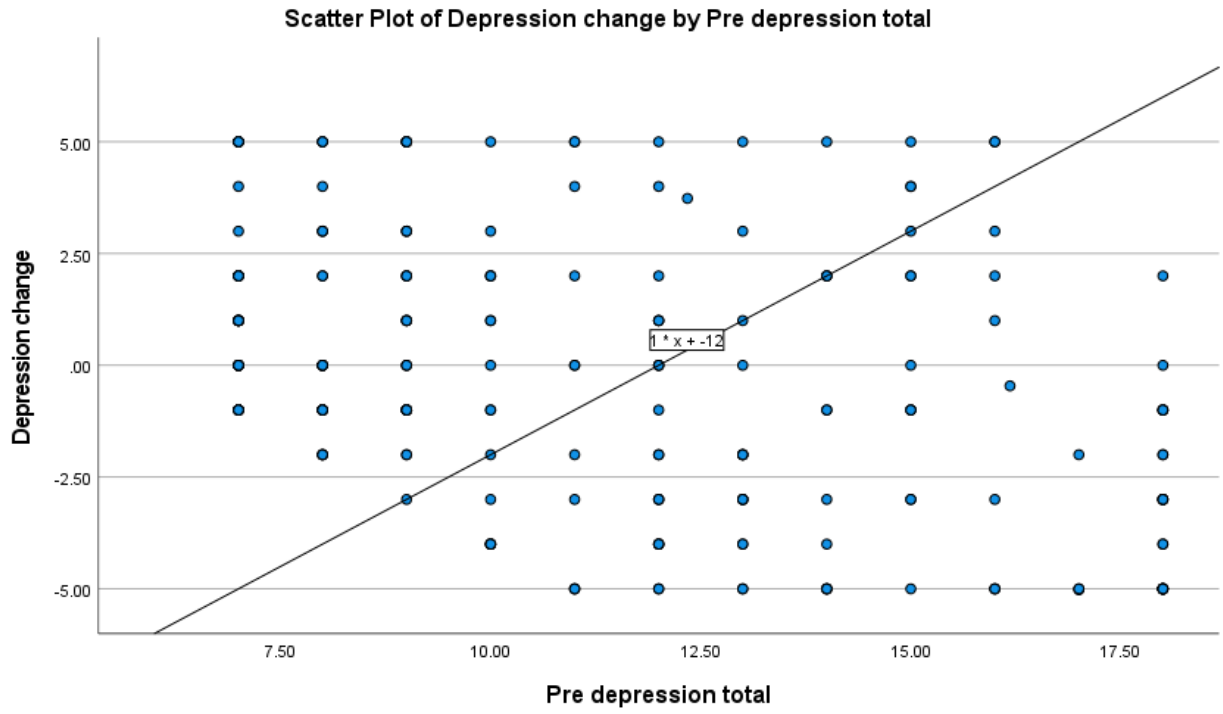

Figure 25

*Scatterplot Assessment of Linearity for Regression Model 5 with Interaction Variables Pre-Intervention Anxiety * Pre-Intervention Stress Mindset on Anxiety Change*

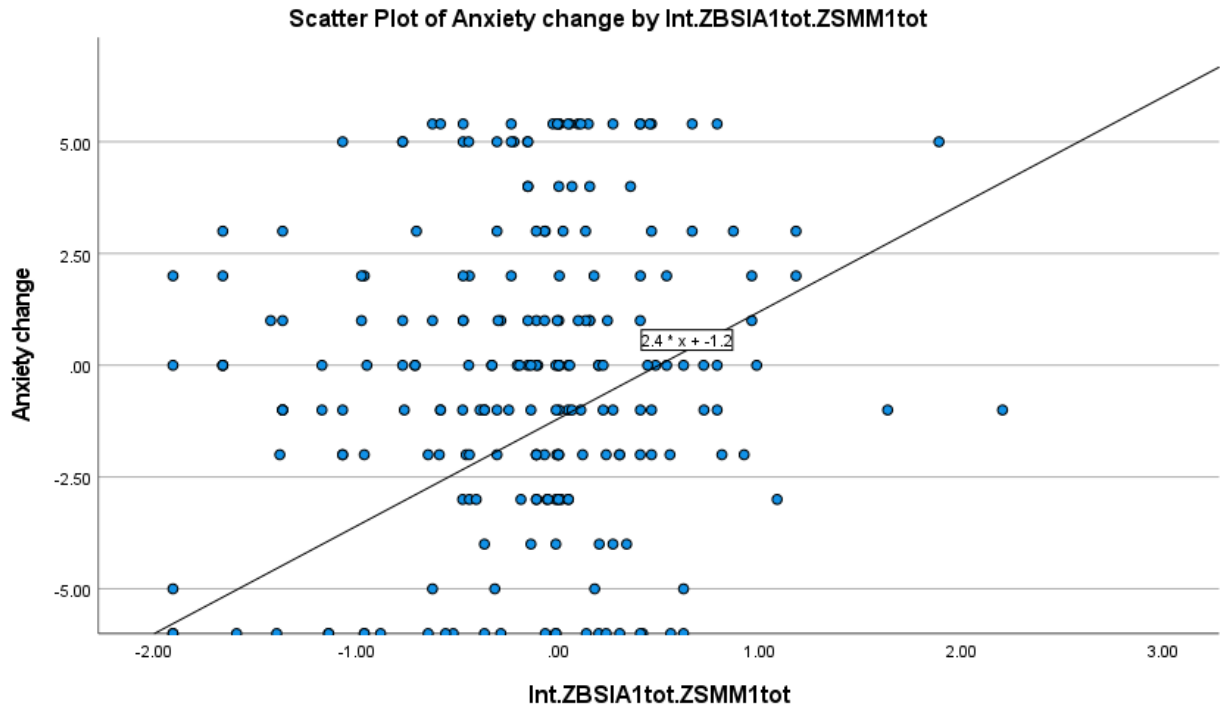

Figure 26

*Scatterplot Assessment of Linearity for Regression Model 5 with Interaction Variables Pre-Intervention Depression * Pre-Intervention Stress Mindset on Anxiety Change*

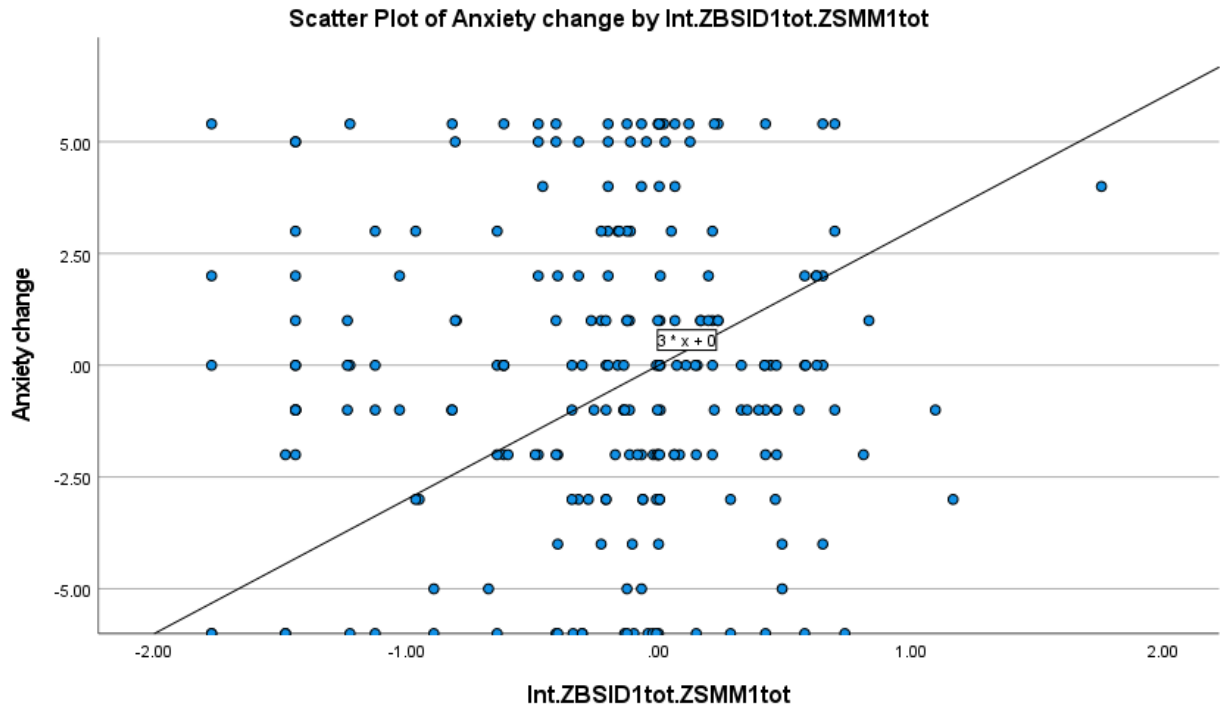

Figure 27

*Scatterplot Assessment of Linearity for Regression Model 6 with Interaction Variables Pre-Intervention Anxiety * Pre-Intervention Stress Mindset on Depression Change*

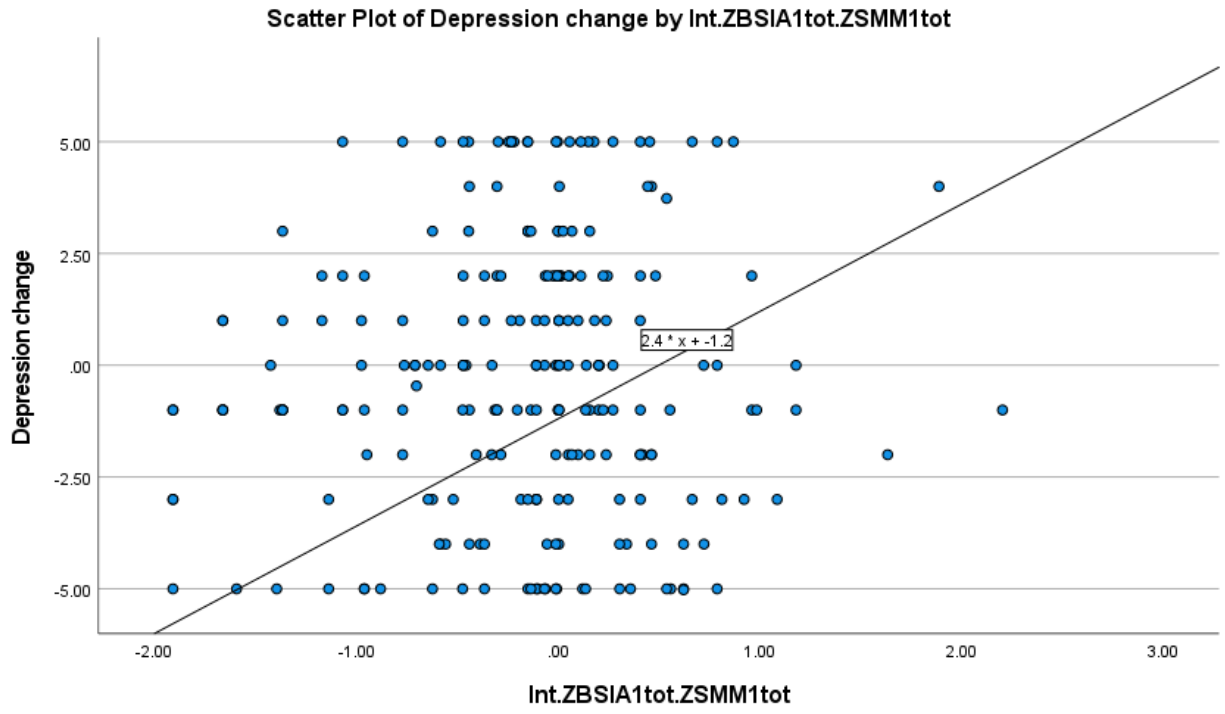

Figure 28

*Scatterplot Assessment of Linearity for Regression Model 5 with Interaction Variables Pre-Intervention Depression * Pre-Intervention Stress Mindset on Depression Change*

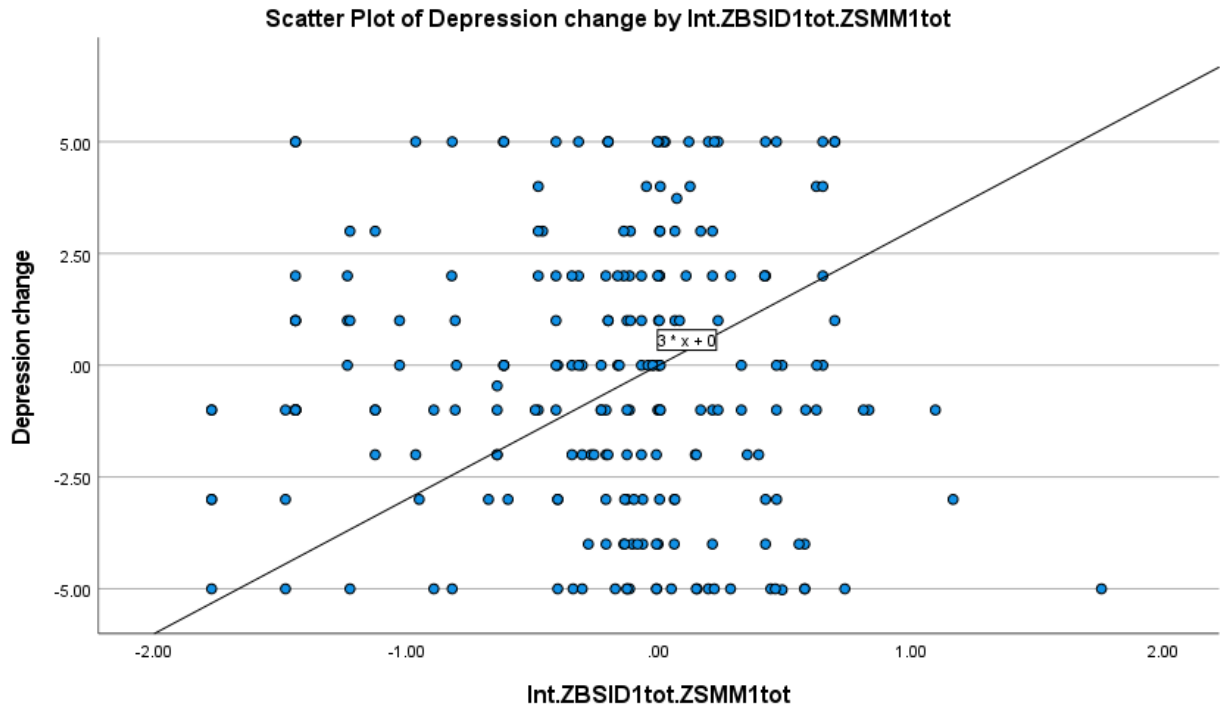

Figure 29

Interaction of Stress Mindset and Pre-Intervention Anxiety on Depression Symptom Change