# Bryant University

## HONORS THESIS

# Examining the Relationships Among Mindfulness, Disability, Social Support, and Stress in Emerging Adults

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## ABSTRACT

College students, as part of the broader population of emerging adults, are thought to be particularly vulnerable to stress compared to other age groups as they transition through adolescence into adulthood. Various internal and external factors including mindfulness, disability, and social support play an important role in students' stress levels. The relationships among these three predictor variables and stress were analyzed in a sample of 1,049 individuals between the ages of 18-29. Responses were obtained from the dataset "Emerging Adulthood Measured at Multiple Institutions 2: The Data" (Grahe et al., 2018). The data were cleaned in Python and analyzed in SPSS using multiple regression analyses. Higher perceived levels of mindfulness and social support were significant predictors of less stress in students, while a higher perceived level of disability was a significant predictor of more stress. The combined regression model showed that mindfulness, disability, and social support accounted for a significant amount of the variance in distress. Determinants of stress are multifactorial; identification and evaluation of variables that account for a significant amount of the variance in stress within a vulnerable population can contribute to the development of effective stress management techniques.

# INTRODUCTION

Emerging adulthood is a developmental period composed of individuals between the ages of 18-29 as they transition from adolescence to adulthood, including the majority subset group of college students (Arnett, 2000; Barlett, Barlett, & Chalk, 2018). It is important to note that the emerging adulthood period is a cultural construct with cultural norms affecting the degree to which people within the age range are able to delay their transition into adult roles until their twenties (Arnett, 2000). Emerging adults have often left the dependency of childhood but have not fully accepted the full responsibilities of adulthood, giving them freedom to explore their identity and different directions in life (Arnett, 2000). However, as a result of this role transition and uncertainty in life, the emerging adulthood population, specifically the important subset comprised of college students, is thought to be particularly vulnerable to stress compared to other age groups (Towbes & Cohen, 1996).

## Stress in college students

It has been suggested that stressors can be divided into three general types: life events, daily hassles, and chronic strains (Misra, Crist, & Burant, 2003). Life events are stressful experiences that cause major disruptions and changes to a person's normal routine (Hudd et al., 2000), while chronic strains describe more enduring problems and conflicts that people face throughout their lives (Pearlin, 1989). Daily hassles are lesser sources of stress that arise on a daily or weekly basis (Misra et al., 2003). One of the main types of chronic strain stressors can be more closely identified as role strain, because institutionalized social roles (e.g. of homemaker) are often long-term stressors for the individual and problems as a result of those roles are long-lasting (Pearlin, 1989). The category of role strain stressors can further be broken down into subtypes such as interpersonal conflicts within role sets—difficulties that arise between people with complementary roles (e.g. wife and husband), or inter-role conflicts—problems caused by different roles with incompatible demands (Pearlin, 1989). However, for college students, the subtype of role strain stressors with the most relevance would be that of role overload, a type of conflict caused by competing roles that place a heavy demand on an individual's stamina and energy (Hudd et al., 2000; Pearlin, 1989). College students must balance the preexisting demand of academics with new demands of developing

social contacts and being responsible for their own daily necessities, and these competing demands lead to role overload (Hudd et al., 2000).

Stress among college students is ubiquitous with literature reporting that 75% to 80% of college students are moderately stressed and 10% to 12% are severely stressed (Pierceall, Keim, & Keim, 2007). 52% of college students have reported high levels of stress throughout a typical semester (Hudd et al., 2000). Female college students' appraisal of personal stress levels were higher compared to males, but no strong evidence has been found to support gender-specific stressors (Brougham, Zail, Mendoza, & Miller, 2009; Hudd et al., 2000). A study by Beiter et al. (2015) found that upperclassmen were found to be more stressed, anxious, and depressed compared to underclassmen, and the same trend was identified in students living off campus compared to those on campus. However, other studies have indicated the opposite in that underclassmen are more stressed than upperclassmen (Brougham et al., 2009). It is possible that this discrepancy can be explained by the types of stress examined; freshmen might feel more college-environment and social stress while seniors might feel more stress regarding post-graduate plans (Hudd et al., 2000). Additionally, the timing at which surveys are distributed is important as different class years might have different stressors depending on the time of year (Hudd et al., 2000).

Academic performance was found to be the leading stressor for college students with other factors such as pressure to succeed, post-graduation plans, self-esteem, financial concerns, social relationships, daily hassles, and familial relationships playing a role (Bedewy & Gabriel, 2015; Beiter et al., 2015; Brougham et al., 2009). Stress as a result of the transition between secondary education and college, and as a result of college itself can lead to several emotional issues including negative affect, depression, and anxiety (Beiter et al., 2015; Crockett, Iturbide, Stone, & Mcginley, 2007). Unhealthy lifestyle changes such as problems with alcohol, sleep difficulties, increased consumption of "junk" food, and lower levels of exercise were additional symptoms of stress in college students (Amaral et al., 2018; Bodenlos, Noonan, & Wells, 2013; Brougham et al., 2009). Negative effects of stress can be mitigated with good coping mechanisms.

Coping strategies can be classified as either problem-focused or emotion-focused (Brougham et al., 2009). People who use problem-focused strategies often alter their behavior to take action or make plans while emotion-focused strategies involve altering expectations and disclosing emotions (Brougham et al., 2009). Unlike college students' use of problem-solving strategies that tend to be more beneficial and less likely to produce symptoms of depression, emotion-focused strategies can include the use of avoidant coping mechanisms and are associated with more negative outcomes and symptoms (Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000; Pritchard, Wilson, & Yamnitz, 2007). However, emotion-focused coping that uses strategies of acceptance and positive reframing compared to avoidant mechanisms have been associated with a more positive outcome, meaning that the type of mechanism used as part of a coping strategy is more important than whether the strategy used was emotional or problem-solving (Brougham et al., 2009). Prior research has found that women use emotion-focused coping strategies more than men, but both genders use emotion-focused strategies more than problem-solving strategies (Brougham et al., 2009). Improving coping mechanisms in conjunction with social support and improved communication can lead to reduced stress in students (Brougham et al., 2009).

There are a few factors that play a role in stress specifically relating to college students. Students in college, especially in their first and second years, must deal with reduced contact with their traditional support groups such as friends, family, and religious groups from home (Hudd et al., 2000). Forming new support groups in college takes time, and the process of developing them is stressful (Hudd et al., 2000). Additionally, changes in disability accommodations at the college level lead to stress in students who need them (Getzel & Thoma, 2008). In elementary, middle, and high school, disability accommodations are incorporated into the curriculum for those who need it, but students in college must disclose their disability to their institution in order to receive help they need (Barnard-Brak, Sulak, Tate, & Lechtenberger, 2010; Getzel & Thoma, 2008). Compared to social support and disability, the presence or absence of mindfulness has a less straightforward but still important impact on college student stress. Individuals with high levels of mindfulness have a heightened ability to cope with and awareness of stressful situations (e.g. peer pressure) (Bowen & Marlatt, 2009). As a result, they tend to choose healthier coping mechanisms such

as talking to a peer instead of using substances, which is a common negative coping mechanism in college that often leads to stress (Pierdomenico, Kadziolka, & Miller, 2017). Social support, disability, and mindfulness are important factors to consider when examining stress in college students.

Mindfulness

The mindfulness construct has roots in religious, cultural, and philosophical traditions, particularly Buddhism (Allen et al., 2006; Brown & Ryan, 2003). In psychological literature, mindfulness has several varying definitions. In its broadest definition, mindfulness involves qualities such as being in the present moment, being attentive and aware, and being calm without judgement, particularly with regards to the self and emotions (Allen et al., 2006; Beitel, Ferrer, & Cecero, 2005; Brown & Ryan, 2003; Keng, Smoski, & Robins, 2011; Pierdomenico et al., 2017). Some researchers include additional aspects of mindfulness into their definitions, such as an expectation that a mindful individual should be able to experience an event fully and accept it without either dwelling on the experience or suppressing it (Cardaciotto, Herbert, Forman, & Farrow, 2008; Keng et al., 2011). Mindfulness is viewed as trait-like, meaning it has a dispositional quality (Masuda, Anderson, & Sheehan, 2009; Pierdomenico et al., 2017). All people have the trait of mindfulness to a degree; individuals with no mindfulness training might possess latent mindfulness while those who practice and train their level of mindfulness may improve it (Brown & Ryan, 2003; Pierdomenico et al., 2017).

With an increasing number of college students presenting with mental health problems and limitations of available campus resources, mindfulness-based interventions can help to reduce student stress and improve well-being (Rosenzweig, Reibel, Greeson, Brainard, & Hojat, 2003). Mindfulness has been found to inversely correlate to negative psychological outcomes such as emotional distress in stressful situations (Beitel et al., 2005; Greeson, Juberg, Maytan, James, & Rogers, 2014). Specifically, studies have negative correlations between mindfulness and depression, dissociation, and rumination among many other variables (Keng et al., 2011). Individuals with high levels of mindfulness have been reported to misuse substances such as alcohol in times of stress less frequently compared to their counterparts, suggesting usage of

healthier coping mechanisms (Pierdomenico et al., 2017). Additionally, positive outcomes such as improved health, social relationships, self-esteem, and sense of autonomy have been associated with the presence of mindfulness (Brown & Ryan, 2003; Keng et al., 2011).

There are three mechanisms of action by which mindfulness is thought to exert its beneficial effects: emotion regulation, reduced rumination, and nonattachment (Coffey & Hartman, 2008). A study by Arch and Craske (2006) examined the effects of focused breathing, a technique similar to mindfulness meditation, on individuals and found that those who participated in the breathing exercise maintained a stable, positive emotional response when viewing negative images compared to groups that had not. The mindfulness technique positively influenced individuals' regulation of emotions resulting in less negative affect and more adaptability when responding to negative stimuli (Arch & Craske, 2006). Other emotion regulating strategies include addressing a source of distress by being aware of and altering thoughts regarding it (Coffey & Hartman, 2008).

Reduction in ruminative thought is another way in which mindfulness is believed to reduce distress (Coffey & Hartman, 2008). Rumination, in contrast to mindfulness which emphasizes the importance of the present moment, is the process of repeatedly focusing on negative emotions and their implications (Nolen-Hoeksema, 1991). A propensity for rumination in an individual predicts depressive and anxiety disorders (Nolen-Hoeksema, 2000). Jain et al. (2007) found that mindfulness meditation focusing on the present awareness of thoughts, sensations, and sounds, bodily movements, and spiritual components was able to reduce rumination while somatic relaxation with a focus on body-awareness relaxation was not. Mindfulness meditation was also able to decrease psychological distress in subjects significantly more than somatic relaxation (Jain et al., 2007).

Nonattachment, the third mechanism hypothesized to play a role in mindfulness's positive effects has its roots in Buddhism and Eastern philosophy (Coffey & Hartman, 2008; W. D. McIntosh, 1997). People who form attachments believe they need to obtain the object of their attachments in order to become happy; however, this can lead to distress and suffering when people are unable to maintain their object, and attachment-based thoughts tend to be ruminative (W. D. McIntosh, 1997). Mindful nonattachment, on the other hand, can help the

individual stay in the present moment and can result in a more stable sense of well-being unaffected by the environment and circumstances (Brown, Ryan, & Creswell, 2007).

Though typically viewed as a dispositional trait, mindfulness is not unchangeable. Mindfulness-based stress reduction programs can improve mindfulness-based skills; studies of these programs for college students showed an increase in psychological health and thus a decrease in distress in those students (Bergen-cico, Possemato, & Cheon, 2013). Some of these programs involve a variety of treatments usually falling under the mindfulness meditation umbrella which includes activities such as breath awareness, walking meditation, and guided imagery (Rosenzweig et al., 2003). Other programs incorporated the idea of mindfulness meditation and related activities with additional discussions on the elements of flexibility, self-compassion, and self-discovery (Galante et al., 2017). A study on Koru, a mindfulness training program involving mindfulness meditation specifically for individuals in the emerging adulthood category, found significant improvements in subjects' perceived stress, sleep quality, and mindfulness compared to the control group (Greeson et al., 2014).

Research suggests that individuals with high mindfulness levels are able to reduce nervous system arousal, a typical physiological symptom of stress, when distressed (Keng et al., 2011; Pierdomenico et al., 2017). It is possible that this mitigation of negative arousal is the result of coping mechanisms (Pierdomenico et al., 2017). Not only does mindfulness correlate with an improvement in self-reported psychological health, but visible changes in the brain were shown in scans of the amygdalae and prefrontal cortexes of individuals with high levels of trait mindfulness compared to those with lower levels (Creswell, Way, Eisenberger, & Lieberman, 2007). Based on these scans, Keng et al. (2011) suggested that mindful individuals might be better at regulating emotional responses through the amygdala.

Social Support

Social support is a broad term that encompasses resources, actual or perceived by an individual, given to that person by others close to them, usually friends or family members (N. J. McIntosh, 1991; Zimet, Dahlem, Zimet, & Farley, 1998). Most definitions of social support agree that it involves a circular transaction between the concerned individuals, in that support does not pass completely from a provider to a recipient, but instead is mutualistically

expressed in a relationship (Gottlieb & Bergen, 2010; Zimet et al., 1998). The closer the relationship between the people involved, the wider the range of social support types available to benefit an individual (Gottlieb & Bergen, 2010). Strong social support has been suggested to have a beneficial effect on an individual's sense of emotional stability, ability to manage stress, and overall well-being (Cohen & Wills, 1985; N. J. McIntosh, 1991). Several studies have demonstrated the ability of a strong support system—either created/provided through the study or already existing—to mitigate the effects of or aid in the prevention of various diseases, disorders, and general health or mental issues such as eating disorders (Winzelberg et al., 2000) and suicidal behavior (Hirsch & Barton, 2011).

The negative relationship between social support and distress has been extensively discussed with regards to several different populations, including that of college students (Crockett et al., 2007; Hirsch & Barton, 2011; Misra et al., 2003; Murray, Lombardi, Bender, & Gerdes, 2012). Crockett et al. (2007) reported on the buffering effect of social support on the effects of stress on Mexican American students, and Hirsch and Barton (2011) found that out of different types of social support, tangible support was most significantly associated with a decrease in suicidal behavior. Misra et al. (2003) examined common primary (e.g. life) and secondary (e.g. academic) stressors of college students and found social support's direct and mediating effects on both types. Consequently, perceptions and type of social support provided are important qualifiers when examining the relationships between support and stress of a given population.

Two consistently identified broad dimensions of social support in literature are source of support, such as spouse or church group, and type of support, including emotional and instrumental (Barrera, 1986; Cohen & Wills, 1985; N. J. McIntosh, 1991). However, more specific evaluations of social support as a construct differ greatly between authors. Many studies include measures to discriminate between types and sources of social support depending on the population being studied, since different types of support can have varying effects on an individual (Alferi, Carver, Antoni, Weiss, & Duran, 2001; Crockett et al., 2007; N. J. McIntosh, 1991). If the type of social support provided does not correspond to the stressed individual's needs, the individual might perceive the support as unhelpful (Horowitz

et al., 2001). Crockett et al. (2007) discriminated between peer-provided support and family support in a study of Latino college students. Individuals with stronger peer support were better socially adjusted compared to those who considered themselves to be better supported by their families; this difference was thought to be due to the ability of peers to better help with issues related to the college environment (Rodriguez, Mira, Myers, Morris, & Cardoza, 2003). Alferi et al. (2001) differentiated between emotional (compassion and concern) compared to instrumental (tangible assistance) support in a population of low-income Hispanic women undergoing treatment for breast cancer, finding that both types of support benefited the women positively. Hirsch and Barton (2011) categorized support into positive social support and negative social exchanges, finding that certain types of support (e.g. emotional, informational, tangible) were associated with lower levels of suicidal thoughts and behaviors while negative social exchanges were identified as a predictor for the opposite. On the other hand, a study conducted by Ardell et al. (2016) found that social support provided by disability services did not help student stress levels, most likely because the service's support did not suite the students' needs. However, most literature reports on the beneficial effects of social support on stress.

Another important discriminating factor when examining the effects of social support on an individual is the difference between perceived compared to actual support. Perceived support represents an individual's confidence that support will be available from a social network if needed and mainly incorporates two dimensions: perceived availability and adequacy of support (Barrera, 1986; Cohen & Hoberman Harry, 2006; Gottlieb & Bergen, 2010). Perceived support is thought to play a large role on the effects of the buffering hypothesis (Cohen & Hoberman Harry, 2006; Gottlieb & Bergen, 2010; Zimet et al., 1998). On the other hand, actual, also called enacted, support involves the actions performed by people in the social network to help an individual (Barrera, 1986). Some researchers have suggested that the degree of the increase in well-being, along with the decrease in stress, depends on the size of the social support system and the individual's feelings of satisfaction with the system (Zimet, Dahlem, Zimet, & Farley, 1998; Barrera, Sandier, & Ramsay, 1981).

There are two main hypotheses thought to explain the relationship between social support and increased health in populations: the buffering hypothesis and the direct effects hypothesis (Cohen & Wills, 1985). The buffering hypothesis suggests that social support protects an individual from the negative mental and physical effects of a stressful event, thus creating a "buffer" (Cohen & Herbert, 1996; Cohen & Wills, 1985). Under this hypothesis, stress will have a large negative effect on individuals with little to no social support, but individuals with stronger support systems will not be as affected by the same stress (Cohen & McKay, 1984). There are two hypothesized mechanisms for the positive benefits of social support on stress (Cohen, 1988; Cohen & McKay, 1984). The first occurs through social support's ability to reduce an individual's stress response to a potentially stressful event by intervening (Cohen, 1988). Individuals' perception of social support can improve their perceived ability to cope with the stressor and prevents the situation from being viewed as stressful (Cohen, 1988). Secondly, support may intervene between a person's experience of stress and the consequent endocrine responses caused by stress appraisal which can lead to pathological responses (Cohen, 1988). This mechanism reduce an individual's appraisal of a stressor and reduces the neuroendocrine response (Cohen, 1988; Cohen & McKay, 1984).

On the other hand, the direct effects, also called main effects, hypothesis suggests that social support can and will benefit an individual regardless of the amount of stress he or she is undergoing (Cohen & Wills, 1985). The direct effects hypothesis relies less on the presence of stress for social support to positively impact an individual compared to the buffering hypothesis (Cohen & Wills, 1985). There are several hypothesized reasons for this beneficial effect; it could be that social support and social networks provide individuals with stability and positive experiences, and/or that support can help one avoid negative experiences (Cohen & Wills, 1985).

Not only is social support thought to decrease the adverse effects of stress, but the health benefits of social support could also be due to its ability to prevent stress in the first place through the lesser known stress prevention model (Barrera, 1986; Uchino & Birmingham, 2011). This model describes an indirect relationship between social support and distress and suggests that an individual is able to avoid or reduce exposure to stressful experiences due to

resources provided by social support (Barrera, 1986; Uchino & Birmingham, 2011). A study conducted by Russell and Cutrona (1991) on older adults supported this model, finding that individuals experienced a lower number of daily hassles when they had higher levels of social support.

Disability

The definition of disability and the concept surrounding it differs depending on the model used to describe it (Nario-Redmond, Noel, & Fern, 2013). The main models include the medical model and the social model (Darling & Heckert, 2010; Nario-Redmond et al., 2013). The medical model emphasizes the undesirability of mental or physical impairments and focuses on the functional limitations of an individual (Darling & Heckert, 2010; Goering, 2015). The social model, on the other hand, suggests that individuals do not need to conform to society standards of function and does not view the individual's impairment in a negative light (Darling & Heckert, 2010; Goering, 2015). In general, the disability construct can be broadly defined as a functional limitation caused by physical or mental impairments that can lead to stigma, social disadvantages, and limitations from society and other external forces (Altman, 2001; Darling & Heckert, 2010; Nario-Redmond et al., 2013).

Approximately 6% to 8% of college students report having a disability (Janusis & Weyandt, 2010). According to surveys conducted by Horn and Berktold (1999), the most common types of disabilities for college students are learning (29%), orthopedic (23%), hearing (16%), visual (16%), speech (3%), or other. For students in primary and secondary education, disability accommodations are provided and incorporated in the curriculum for those in need of it (Barnard-Brak et al., 2010). This built in structure changes at the college level; identification of a disability depends on the student's ability and desire to disclose his condition (Getzel & Thoma, 2008). Despite national legislation that requires institutions to provide accommodations for students with disabilities in both the realms of academics and college campus programming, if a student fails or refuses to disclose his disability to the institution, he may not receive appropriate accommodations or support (Getzel & Thoma, 2008; Marshak, Wieren, Ferrell, Swiss, & Dugan, 2010). Another obstacle in ensuring students receive the help and accommodations they need is that students may not know that

they have a disability, of their lawful entitlement to disability-related services, or of the existence of those services on campus at all (Megivern, 2002). A study conducted by Megivern (2002) found that only 23% of the students surveyed were aware of disability services on campus.

Research has found that students with disabilities face many difficulties (Hall, Spruill, & Webster, 2002). Academically, students may lack the necessary skills or strategies to succeed, and may be less prepared (Hall et al., 2002; Hartley, 2010; Heiman & Precel, 2003). The rate of students with disabilities dropping out also is far higher than that of their counterparts (Hartley, 2010; Heiman & Precel, 2003). As a result, even though the percentage of disabled students entering college has increased over recent years, the percentage of disabled students completing their college coursework has remained the same (Getzel & Thoma, 2008). In addition to academic challenges, students with disabilities often have to cope with social stigma from their professors and peers (Hartley, 2010). Due to this stigma, a student may refuse to disclose their disability and forgo institutional services that could help them (Hartley, 2010). Perceptions of other barriers, including a desire to avoid negative social reactions, identity issues, or negative experiences in the past can also affect a student's disability disclosure (Marshak et al., 2010).

In literature, the reported role of disability as a stressor is inconsistent, with some research identifying it as a stressor, and others reporting no significant differences in perceived stress (Ardell et al., 2016). Hurst et al. (2012) reported college students perceiving their disability as a major stressor, and those with learning disabilities described feeling isolated and fundamentally different from other students. Research conducted by Ardell et al. (2016) reported that perceived stress was higher for students with a disability compared to those without, though no significant differences in stress level were observed whether or not the student was enrolled in Disability Services for Students on campus. On the other hand, Hall et al. (2002) found that students with a learning disability were less stressed than those without. A possible explanation for this might be because resilience might counteract the effects of stress in students with a disability through protective effects (Hall et al., 2002).

There does not seem to be much literature examining the pure relationship between student disability and distress. Instead, most articles focus on the mediating roles of support provided by student disability services (e.g. Ardell, Beug, & Hrudka, 2016) or of various mediating variables including social support, self-esteem, self-efficacy, resiliency, need for achievement, and locus of control (Dooling-Litfin & Rosen, 1997; Elliott et al., 1992; Hall et al., 2002; Hartley, 2010). For example, previous literature has reported that college students with disabilities such as Attention Deficit Disorder (ADHD) report lower self-esteem and self-efficacy compared to their peers with regard to academic ability, which might affect stress (Dooling-Litfin & Rosen, 1997). Additionally, most articles in literature do not delve into the relationships of each type of disability on stress or any other factor.

Research Questions and Hypotheses

Although much research has been conducted on the individual relationships of certain variables with stress, the literature reports some inconsistencies in results. This study aims to further examine the relationships among student perceptions of individual level of support, mindfulness, disability and stress with the following hypotheses:

> H1: Higher degrees of social support will be a significant predictor of
> less stress (negative relationship).
> H2: Higher degrees of mindfulness will be a significant predictor of
> less stress (negative relationship).
> H3: Higher degrees of disability will be a significant predictor of
> more stress (positive relationship).

Additionally, though the three identified predictor variables play a defined role in college student stress, almost no research has looked at amount of variance in stress accounted for by these constructs altogether. The literature indicates a strong likelihood that:

> H4: The combined regression model will account for a significant
> amount of variance on distress.

## RESEARCH METHODOLOGY

Data

The data for this research project was obtained from the dataset "Emerging Adulthood Measured at Multiple Institutions 2: The Data," published in the Journal of Open Psychology Data in 2018 (Grahe et al., 2018). This dataset contained information from surveys of more than 3,134 students at 32 different academic higher-education institutions in the United States from 2016-2017. Data on individual perceptions of more than 15 different measures including mindfulness, support, disability and distress were collected.

Participants

Respondents aged 18-29 were selected for, and those whose ages were not within this age range were excluded from analysis. From that group, only respondents with responses for all questions in the mindfulness, disability, social support, and stress categories were included (N=1,049). The mean age was 20.2 years (SD = 2.3). 72.7% of the sample identified as female, 25.2% as male, and 2.1% as other. Most individuals reported some amount of college education (98.4%) with 86.6% of the total population reporting currently being in college. The majority of participants identified as Caucasian (60.5%), followed by African American (9.7%), Hispanic (9.6%), Asian (6.5%), and Native American (0.4%). 3.2% of participants identified as an unlisted race and 10.0% identified as more than one race.

Measures

Different scales and questionnaires were used to assess student perceptions of personal levels of stress, mindfulness, social support, and disability.

A modified 10-item version of the Perceived Stress Scale ($\alpha$ = .85) (Cohen, Kamarck, & Mermelstein, 1983) was used to assess student stress. Participants indicated their feelings over the last month on a 5-point scale (from 1 = strongly disagree to 5 = strongly agree), with a higher number meaning more stress. Prior to calculating the mean, certain items were reverse scored.

The 15-item Mindful Attention Awareness Scale ($\alpha$ = .81) (Brown & Ryan, 2003) was used to assess mindfulness. Participants indicated the frequency of certain thoughts and emotions

over one day on an 8-point scale (from 1 = almost always to 8 = almost never), with a higher number meaning a higher level of mindfulness. Item scores were averaged before analysis.

The 12-item Multidimensional Scale of Perceived Social Support ($\alpha$ = .88) (Zimet et al., 1998) was used to assess social support. Participants indicated their feelings towards people and relationships in their lives on a 7-point scale (from 1 = very strongly disagree to 7 = very strongly agree), with higher numbers meaning higher levels of social support. Item scores were averaged.

A modified 15-item version of the Personal Opinions Questionnaire ($\alpha$ = .77) (Bolton & Brookings, 1998) was used to assess disability identity. Data from this measure included both participants who did and did not indicate they identified with a disability. Unlike the original dichotomous response format used in Bolton and Brookings (1998) questionnaire, participants from this dataset indicated their degree of agreement towards statements on the effect of disability on their lives on a 5-point scale (from 1 = strongly disagree to 5 = strongly agree). Certain items were reverse scored, so a higher number meant a higher degree of perceived disability, then averaged.

Procedures

All data was obtained from the "Emerging Adulthood Measured at Multiple Institutions 2: The Data" dataset. A Python script was written to isolate only participants who had responses for all questions related to the variables of mindfulness, disability, social support, and stress, resulting in a total sample of 1,049 people. Python was also used to reverse score answers to certain questions (as described in the Measures section) along with mean calculations. Descriptive, correlational, and multiple regression analyses were conducted using the Statistical Package for the Social Sciences (SPSS), the standard in psychology research.

**RESULTS**

Correlations

Results of our preliminary analyses were significant in their expected directions. Our correlational results (Appendix 1, Table 1) support hypotheses 1, 2, and 3 in that social

support is significantly negatively related to stress (r(1,047) = -.25, $p < .001$), mindfulness is significantly negatively related to stress (r(1,047) = -.41, $p < .001$), and disability is significantly positively related to more stress (r(1,047) = .34, $p < .001$).

<u>Regression Analysis</u>

Multiple regression analyses were used to predict stress in college students based on mindfulness, disability, and social support. This model was found to be significant (F(3, 1045) = 120.07, $p < .001$), with an $R^2$ of 0.256 which supports hypothesis 4. The F Change (Appendix 1, Table 2) indicates the amount of variance in stress accounted for by the three predictor variables altogether is significant. The ANOVA (Appendix 1, Table 3) shows that the model as a whole is significant and viable. Each individual predictor variable within the combined regression model contributed a significant amount to the total variance in stress, though to different degrees (Appendix 1, Table 4).

## **DISCUSSION**

The trends and correlations we found among mindfulness, disability, social support, and stress were mostly consistent with prior studies in that social support and mindfulness had a negative relationship with stress while disability had a positive relationship (Appendix 2, Figure 1). Out of the three predictor variables, trait mindfulness had the strongest relationship with stress. Even though this study, due to its retrospective nature, focused on trait mindfulness instead of the more frequently-studied improvements to mindfulness for stress reduction, the correlation coefficient (r(1,047) = -.41, $p < .001$) of the mindfulness and stress relationship was about the same as those reported in studies examining either type of mindfulness (Alferi et al., 2001; Pierdomenico et al., 2017).

The relationship between social support and stress was weaker than that of the relationship between mindfulness or disability with stress, but it was still significant (r(1,047) = -.25, $p < .001$). Additionally, it was consistent with correlations reported in other studies on college students that examined the social support construct in a similar way (e.g. Coffman & Gilligan, 2002). Low social support and stress correlation coefficients could be due a mismatch between the type of social support provided by an individual's support network and the

individual's perceptions of helpful support (Horowitz et al., 2001). Studies that discriminate between types of social support provided by a network may report different results (Ardell et al., 2016; Crockett et al., 2007), but this study was restricted by the responses provided by the dataset.

With a correlation of r(1,047) = .34 (p < .001), disability was also found to be a significant college student stressor. However, these results do not support literature reporting that students with a learning disability were either the same amounts of or less stressed compared to students with disabilities (Hall et al., 2002). These conflicting results could be due to the type of disability suffered by the student, as different disabilities (e.g. psychiatric vs. learning disability) have different impacts on a person's life and his or her ability to function normally (Hartley, 2010). This study did not separate the disability variable into specific types of disability. Overall, it is difficult to compare exact correlation coefficients of the disability-stress relationship to other studies due to vast differences in the way researchers define disability.

Regression analyses showed that mindfulness, disability, and social support account for 25.6% of the variance in stress (Appendix 1, Table 2). Determinants of stress are multifactorial, as shown by the Student Stress Scale, a modified version of the Social Readjustment Rating Scale developed by Holmes & Rahe (1967). This scale lists over 30 different stressors that cause varying degrees of stress in a student's life. The ability of these three variables to account for 25% of the variance in stress despite the large variety and number of stressors affecting an individual's overall stress level is important and significant. Of the three predictor variables, mindfulness ($\beta = -.34$, $t(1,045) = -12.36$, $p < .001$) accounted for the greatest amount of the variance in stress, and social support ($\beta = -.15$, $t(1,045) = -5.53$, $p < .001$) accounted for the least. These trends were similar to the ones reported in the individual correlations, most likely for the same reasons.

<u>Methodological Strengths and Weaknesses</u>
As with all studies, there are some important strengths and weaknesses that must be addressed when discussing the applicability of results. Some strengths of using this dataset were that the

sample of students was geographically diverse with over 1,000 respondents from a large variety of public and private schools of different sizes. Additionally, the measures used while collecting data (as described in the Measures section) were reliable and well-tested scales for this population, as shown by their Cronbach's alpha scores.

One of the largest weaknesses of this dataset was the required exclusion of over 2,000 participants due to missing responses for one or more of the survey questions related to the variables of mindfulness, disability, social support, or stress. Confusing instructions for questions on the disability variable were the main reason for missing data. Because questions were on a scale of 1 (not at all) to 5 (all the time), respondents without a disability should have responded "1" to all questions pertaining to the effects of a disability on their life. Unfortunately, many people either left responses blank, or self-identified as not having a disability but then responded to questions asking their disability with a high score. Another weakness of this study involved the sample's average age of 20.1 years. The emerging adulthood population includes individuals between the ages of 18-29; an average age of 20 years means the sample is skewed to the younger end of the age range. The sample was also predominantly female. Additionally, since the responses were mostly from U.S. college students, the results of this study cannot be generalized to other countries or cultures.

Future Directions

This study could be vastly improved by fixing the weaknesses highlighted in the Methodological Strengths and Weaknesses section. For example, collecting survey results from a broader age range in the emerging adulthood population, improving the clarity of instructions for each variable, and obtaining responses with more balanced gender ratio, could broaden the applicability of results. Examining the regression model and relationships among the variables of interest in different populations (e.g. older individuals in their fifties), or of the same emerging adulthood population but in a different country could yield different results. Another future direction could be to use more detailed types of modeling. PATH analysis is an in-depth modeling technique that examines how variables relate to one another in an extremely detailed manner. It allows researchers to draw cause and effect-type

conclusions from their results, even if the study is retroactive, and could help draw more meaningful conclusions from this dataset.


## CONCLUSION

Individuals, specifically college students, in the emerging adulthood population are particularly vulnerable to stress from a variety of different factors. Correlational analyses reveal that higher degrees of mindfulness and social support are significant predictors of less stress in students, while the opposite is true for disability. Combined regression analyses indicate that mindfulness, disability, and social support account for a significant amount of the variance in distress. Identification and evaluation of variables accounting for some amount of the variance in a vulnerable population's stress can help contribute to the development of stress management techniques.

## APPENDIX 1

Table 1: Correlations among Social Support, Mindfulness, Disability, and Stress

| Variable | Stress | Social Support | Mindfulness | Disability |
|---|---|---|---|---|
| Stress | | | | |
| Social Support | -.25*** | | | |
| Mindfulness | -.41*** | .15*** | | |
| Disability | .34*** | -.21*** | -.19*** | |
| Mean | 31.91 | 65.02 | 53.83 | 46.22 |
| Standard Deviation | 6.50 | 13.80 | 12.62 | 8.22 |

*** indicates $p < .001$

Table 2: Model Summary

| R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | df1 | df2 | Sig. F Change |
|---|---|---|---|---|---|---|---|---|
| .506 | .256 | .254 | 5.614 | .256 | 120.067 | 3 | 1045 | .000 |

Table 3: ANOVA

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 11350.54 | 3 | 3783.514 | 120.067 | .000 |
| Residual | 32929.74 | 1045 | 31.512 | | |
| Total | 44280.28 | 1048 | | | |

Table 4: Regression Results for the Parameters Predicting Stress

| | Unstandardized Coefficients B | Std. Error | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|
| (Constant) | 37.119 | 1.657 | | 22.398 | .000 |
| Disability | .191 | .022 | .241 | 8.721 | .000 |
| Social Support | -.071 | .013 | -.152 | -5.528 | .000 |
| Mindfulness | -.174 | .014 | -.338 | -12.357 | .000 |

## APPENDIX 2

Figure 1: Correlations among Social Support, Mindfulness, Disability, and Stress
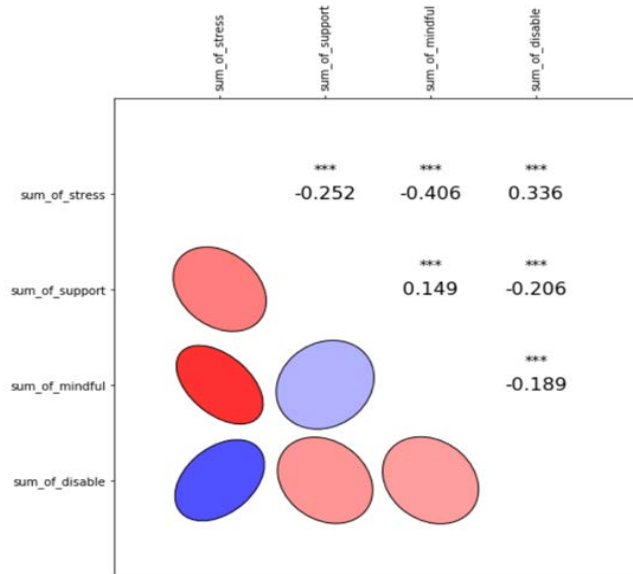
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