

IS *THIS* STRESS BENEFICIAL? STRESS MINDSET BELIEFS FOR SPECIFIC
CATEGORIES OF STRESSORS

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ABSTRACT

There is individual variability in the degree to which people view stress as debilitating versus enhancing. These stress mindsets have been shown to moderate the link between stress and psychological, physiological, and performance outcomes. However, when people are asked about their stress mindset, they are asked to generally think about stress and how it might impact their health, performance, and well-being. There is a gap in the literature on whether stress mindsets vary for specific categories of stressors. In the present study, we recruited a sample of college students to complete the Stress Mindset Measure-General (SMM-G) and adapted the measure to address 6 different types of stressors in order to investigate whether (1) different stressor types are associated with different stress mindsets, and particularly whether (2) stigma-based stress is perceived as more debilitating in comparison to other categories of stress. Participants are also asked about the degree in which they thought about these 6 stressor categories upon completing the SMM-G. We found that when people complete the SMM-G, they tend to be thinking most about academic oriented events. We also found that stress mindset ratings vary for different categories of stressors, with academic and societal stressors being perceived as the most enhancing and financial and illness/injury related stressors as the least. Importantly, there were differences based on identity, such that those who identify as a racial/ethnic, sexual, and/or gender minority were more likely to consider identity-based stressors in their stress mindset ratings and were more likely to consider identity-based stressors as more debilitating.

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CHAPTER 1

INTRODUCTION

One of the pioneers of stress research, Hans Selye, defined stress as the nonspecific response of the body to any demand for change made upon it (Selye, 1976). He believed that this response can be to either pleasant or unpleasant stimuli, as living beings are constantly under stress (Selye, 1976). However, if you are raised in American society, you will likely get a steady barrage of messages about how stress is bad and should be avoided. Headlines beginning with “Even the small stresses of daily life can hurt your health” (Wallace, 2018) and “Stress can make you sick” (O’Connor, 2019), by media outlets such as the Washington Post and the New York Times, often remind us of the negative aspects of stress. It is certainly true that stress is often associated with negative physical and mental health outcomes (Crum et al., 2013). Due to these associations, it is less common to hear discourse around the reality that stress can, at times, be helpful, and consequently we often come to circumstances with the goal of strictly reducing or avoiding stress (Crum et al., 2020). Indeed, there is plenty of research linking stress to a host of poor outcomes, including risk processes in youth (Jamieson & Mendes, 2016), cardiovascular diseases (Juster et al., 2010) and psychopathology (Aldao et al., 2010). On the other hand, research suggests that the stress experience has beneficial outcomes as well. Perhaps the most well-known example is the fight-or-flight mechanism, which utilizes the autonomic nervous system to activate the hypothalamic-pituitary-adrenal (HPA) axis to provide an organism with the boost in energy and blood flow needed to survive dangerous situations (McEwen, 2007). Additionally, there are also scenarios where stress can act as a factor that motivates one to prepare for something, facilitate growth and learning (Salehi et al., 2010), and push us to connect with meaning in our lives (Tedeschi & Calhoun, 2004). However, not all stressors are alike, and

some will certainly be more helpful than others. Racial discrimination, for example, has been associated with adverse impacts such as increased risk of hypertension, abdominal fat, worsened sexual functioning, nutrition risk, etc. (Williams & Mohammed, 2009). In comparison to other forms of stress, racial discrimination might be especially toxic. For example, every day discrimination has been associated with increases in depression and lower quality of life, whereas childhood adversity and neighborhood depression were not associated with either outcome (Adams et al., 2015). There is very little research, however, on how perceptions of the enhancing role of stress might vary across different types of stressors. In the present study, we examine whether: (1) stress mindset ratings are driven by specific types of stressors (do specific stressor categories come to mind when people are asked about how beneficial or harmful stress is?); (2) different stressor categories (e.g., academic, interpersonal, identity-based, financial, societal, and illness) elicit different stress mindsets. We are particularly interested in whether people view identity-based stressors as less stress-enhancing when compared to other types of stressors. Because perceptions of identity-based stressors might be different for people who are more likely to experience identity-based discrimination and microaggressions, we will also specifically examine stress mindset perceptions among people who identify as racial/ethnic, sexual, and/or gender minority group members.

The positive effects of stress

Stress has been associated with a number of benefits, including social bonding, motivation, performance and connection to meaning (Cohen, 2011; Merrill et al., 2015, Moore et al., 2013; Park et al., 2012; Taylor, 2006, Vine et al., 2013; Vine et al., 2015). The notion that certain levels of stress can promote optimal performance dates all the way back to 1908, as the Yerkes-Dodson law suggested that an optimal level of arousal promotes optimal performance on

behavioral tasks and over- or under-arousal reduces task performance (Cohen, 2011). More recently, the individual zones of optimal functioning (IZOF) model, developed by Juri Hanin in the 1970s, suggested that there are individual differences that impact the subjective emotional and stressful experiences which subsequently impact an individual's optimal performance in response to stress (Ruiz et al., 2014). In terms of motivation, academic and general stress have been associated with higher intrinsic motivation to accomplish tasks (J. Park et al., 2012). Outside of the classroom, stress has also been found to predict subsequent enhanced performance in meaningful, stressful situations such as flying a plane (Vine et al., 2015), playing sports (Moore et al., 2013), or performing motor tasks such as conducting surgery (Vine et al., 2013). In these cases, evaluating stress as challenging predicted better performances, while the evaluation that a stressful situation is threatening predicted worse performances. There are contexts, therefore, where stress has adaptive impacts on motivation and performance.

Stress has also been associated with increases in social bonding. Through biological processes primarily related to the hormone oxytocin, stress can elicit a tend and befriend response (Taylor, 2006). Taylor and colleagues (2006) demonstrated that oxytocin, opioids and dopaminergic pathways have affiliative effects during the stress experience that leads an individual to seek social contact in order to relieve their stress through tending to someone or befriending someone. Whether this social bond actually helps to decrease stress largely depends on the quality of the social contact, as negative social contacts may exacerbate stress while positive social contacts are linked to a reduction in stress (Taylor, 2006). Stress and oxytocin also drive humans towards others by increasing pro-social behaviors (Bartz et al., 2011). Through mechanisms such as increasing trusting behaviors (Kosfeld et al., 2005) and increasing cooperation (Declerck et al., 2010) and generosity (Zak et al., 2007) oxytocin positively impacts

social relationships. Stressful experiences can therefore increase social bonding via multiple pathways.

In terms of connection to meaning, the meaning that we make from our narrative of a situation can either have positive or negative effects on one's self and their identity (Merrill et al., 2015). The connections that a person makes between themselves and an event, as well as the narrative that they form about that connection has been found to impact identity and well-being (Merrill et al., 2015). Individuals that narrate negative connections between themselves and a highly stressful traumatic event exhibit psychological and identity-based distress, whereas individuals that narrate positive connections between themselves and stressful experiences show adaptive effects on their identity, including psychological growth (Merrill et al., 2015). Stressful events can therefore lead to changes in meaning and identity formation, leading to psychological growth.

Stress mindsets

Stress mindset can be defined as the belief that one has about the impacts that stress has on their physical and/or mental health (Crum et al., 2013). One's stress mindset influences stress responses and it has been shown to be distinct from other important stress variables such as the appraisal of stressful stimuli, the severity of the stress experience, and the coping methods (Crum et al., 2013). To varying degrees, an individual can believe that the experience of stress has enhancing/beneficial effects, or they can believe that the stress experience has primarily debilitating/negative effects (Crum et al., 2013). These stress beliefs can alter stress appraisals (Crum et al., 2013; Kilby & Sherman, 2016), and these appraisals have influence on the coping behaviors that are chosen in response to stress (Folkman, 2010; Horiuchi et al., 2018; Keech et al., 2018).

Research has shown that stress mindsets are important in determining response to threatening and challenging circumstances. Stress is evaluated as being either challenging or threatening based on the perceived demands that the stress brings, as well as the perceived resources that the individual has in order to meet those demands (Crum et al., 2017). If the individual perceives that they lack the resources (such as skill or knowledge) to deal with a stressor, they will view the stress as threatening (Crum et al., 2017). Conversely, if the individual believes that their resources are sufficient, they will deem the stress to be challenging (Crum et al., 2017). Crum and colleagues found that, in either challenging or threatening perceived stress conditions, a mindset that stress is enhancing was associated with increased production of dehydroepiandrosterone-sulfate (DHEAS), as compared with a mindset that stress is negative. DHEAS is an anabolic growth hormone produced by the adrenal gland that helps to protect against the negative effects of cortisol, and therefore protects against the negative impacts of stress (Morgan et al., 2004). This research suggests that a stress-is-enhancing mindset leads to adaptive physical impacts, as DHEAS hormones may facilitate one's ability to endure future stressors (Crum et al., 2017). It was also found that those who perceive stress as challenging and enhancing tend to experience greater increases in positive affect, will be more aware of positive stimuli and have greater cognitive plasticity, whereas those with a mindset that stress is debilitating will have worse outcomes as it relates to these areas (Crum et al., 2017).

It is not surprising that a growing body of literature connects a stress-is-enhancing mindset to a host of positive outcomes. Mental health outcomes are worse when stress perceptions are particularly negative, but especially for those with stress-is-debilitating mindsets (Huebschmann & Sheets, 2020). An individual with a stress-is-enhancing mindset tends to have less of a decrease in perceived self-control and less perceived

distress in response to adverse life events than those who believed that stress is completely harmful (D. Park et al., 2018). Besides having adaptive impacts on perceived distress and self-control, positive stress beliefs have also been associated with lower perceived somatic symptoms, increases in academic performance, physical health and psychological wellbeing, as well as more proactive behaviors under stress (Keech et al., 2018). These findings suggest that, in general, there are benefits to a stress-is-enhancing mindset and to perceiving stress as challenging rather than threatening. This is easier said than done, however, as certain chronic stressors may truly be out of one's control or have demands that far exceed the resources than an individual has.

The stressful experience of discrimination

Stress mindsets have important effects, but existing literature often treats stress as one broad concept without having a more nuanced lens to consider whether people might have different mindsets for different types of stressors. It is important to study the way in which the features of stressors might systematically change stress mindsets. There are forms of stress that may be beyond our control and some that can be deemed as unfair or unjust. In such cases, it might be harder to tap into the positive aspects of stress (indeed, there might truly be fewer positive outcomes for such stressors). An example of a stressor with these features would be identity-based discrimination.

Identity-based discrimination can impact the lives of individuals belonging to racial, ethnic, sexual and/or gender minority identities at multiple levels. More specifically, discrimination in the form of racism and/or heterosexism is related to poorer mental health including increased depression (Vargas et al., 2020). On an individual and social level, discrimination can take the form of microaggressions or micro assaults. Most African Americans

report having experienced racial discrimination at some point in their life, and these experiences provide burdens that make life more difficult (Alio et al., 2020). Perceived racial discrimination has also been associated with increases in life difficulty of ethnic minorities by decreasing their sense of mastery while increasing psychological distress (Broman et al., 2000). Although interpersonal discrimination is the more overt and most studied form of racism, racism is deeply embedded in the larger societal structure and can impact mental health through more structural channels such as the proliferation of stress, environmental crises that increase stress exposure, and the formation of negative stereotypes around the cultures of people of color (Williams, 2018). On a more institutional and systemic level, racism has cost racial/ethnic minority populations opportunities in terms of wealth, and places of living through residential segregation (Adelman, 2004), and has detrimentally impacted their social capital by affecting their ability to form beneficial peer relationships (Brondolo et al., 2012). The additional distress stemming from racism itself has been found to lead to negative mental and physical health outcomes that contribute to health inequities (Gee et al., 2007; Gee & Ford, 2011; Smedley, 2012), suggesting that racism and identity-based discrimination is a form of stress that contributes to multiple levels of maladaptive outcomes for racial and ethnic minorities.

Identity-based discrimination also impacts sex and gender minorities through heterosexism. Individuals belonging to lesbian, gay or bisexual (LGB) identities have a higher prevalence of mental health problems than individuals who are heterosexual (Feinstein, 2020; Hatzenbuehler, 2009; Meyer, 2003). According to the Minority Stress Model, this relationship can be explained by minority stress as it relates to stigma, prejudice, and discrimination that create stressful social environments (Meyer, 2003). The Psychological Mediation framework extends this model, suggesting that the stigma-related stress that sexual

minorities disproportionately face increases emotion dysregulation, interpersonal conflict, while their thoughts surrounding stigma heightens the risk that someone who identifies as a sexual minority will develop mental health problems (Hatzenbuehler, 2009). Lastly, the Rejection Sensitivity Model extends both of these theories by emphasizing the role of perception in stigma-related experiences as it relates to rejection, and by acknowledging the consequences of anticipatory emotions such as anger and anxiety (Feinstein, 2020). The key here, is to analyze perception as it relates to stigma-related experiences, suggesting that discrimination in the form of micro-aggressions can be an ambiguous experience exacerbated with previous experiences of rejection and prejudice (Feinstein, 2020). With these frameworks in mind, one can examine the impact of stigma-based stress on people identifying as a sexual minority and recognize that the maladaptive outcomes of discrimination might be particularly salient to one who deals with this type of chronic strain.

With the negative impacts of stigma-based stress in mind, there are also many cases where individuals of stigmatized identities are thriving in society. It is also important, then, to discuss the potential benefits that may stem from successfully coping with and overcoming stigma. It has been suggested that individuals who successfully overcome the experience of stigma tend to view overcoming stigma as an empowering rather than a draining process (Shih, 2004). Growth stemming from the experience of stigma-based stress in sexual minorities may also be associated with less internalizing mental health symptoms through effective emotion regulation (Wang et al., 2016).

That being said, just because growth *can* occur from the experienced stress of stigma, does not mean that it *often* does or that it's not *more challenging* to grow from this type of stressor as compared with other stressors. One might argue that the chronicity, unfairness, and

lack of acceptable coping responses to discrimination could mean the balance of negative to positive effects of identity- and stigma-based stressors would be more weighted toward the negative than other types of stressors.

Stigma- and identity-based stress is a particularly chronic form of stress that has disproportionately negative impacts on ethnic, sexual and/or gender minorities (Vargas et al., 2020). With our current societal structure, constructs such as racism and heterosexism are pervasive and multi-faceted throughout American culture. In many ways, then, the experience of discrimination or institutional disadvantage are not only chronic, but uncontrollable, as they are so deeply ingrained into our society. With this uncontrollable nature, stigmatized individuals have been forced to find ways to adapt to and overcome this form of stress, which may have benefits as it relates to resilience and growth. However, these stressors are unfair/unjust and so might elicit responses that differ from other stressors such as academic stress. It is possible that (1) positive benefits from such chronic, unjust stressors are less common; and therefore (2) stress mindsets about identity-based stressors are more negative as compared with other types of stressors. This exploratory study seeks to examine whether (1) specific stressors tend to come to mind when people are asked about stress mindsets, (2) people view different stressor categories as more or less enhancing/debilitating. We are particularly interested in testing whether identity-based stressors are viewed as less stress-enhancing as compared with other types of stressors. It will be important to examine people who identify as racial, ethnic, sexual, or gender minorities separately from those who identify as white, straight, and cis gender as their perceptions of the effects of discrimination could be quite different.

CHAPTER 2

METHODS

Participants

Our sample included current 182 American University students and recent alumni with ages ranging from 18 to 26. Our sample included 42 individuals who were assigned as male at birth and 134 individuals who were assigned as female at birth which is fairly similar to the demographic of American University students. As it relates to gender identity, our sample included 131 female participants, 41 male participants, 1 transgender male participant, 1 gender non-conforming participant, 2 non-binary participants and 6 participants who did not answer. As it relates to race, we had 117 White or Caucasian participants, 14 Black or African American participants, 16 Asian participants, 17 multiracial participants, 11 participants identified as another racial category and 7 individuals who did not answer. As it relates to ethnicity, our sample included 21 Hispanic, 155 non-Hispanic participants and 6 individuals who did not answer. With respect to sexual identity, the sample included 128 heterosexual/straight participants, 3 lesbian participants, 28 bisexual participants, 11 queer participants, 6 participants who identified with another sexual identity and 6 participants who did not answer.

Measures

Screening and demographics

Participants were eligible to participate in the study as long as they indicated they are 18 years of age or older, are fluent in the English language and are current American University students or recent alumni (class of May 2020 graduates). Participants' age, race, sex, gender, year in school, family's household income, receipt of needs-based aid, region of the country, area of upbringing, parents' marital status and occupational status were collected.

Stress mindsets

We used the Stress-Mindset Measure - General (SMM-G) (Crum et al., 2013) to explore each student's general beliefs about stress. The measure comprises eight items measured on a 5-point Likert scale ranging from 0-strongly disagree to 4-strongly agree. Half of the items measure a stress-is-enhancing mindset, such as "Experiencing stress facilitates my learning and growth," and the other half measure a stress-is-debilitating mindset, such as "Experiencing stress depletes my health and vitality." Scale scores are calculated as a mean of items. Higher scores on the Stress Mindset Measure represent a stronger belief that stress is enhancing.

Upon completing the SMM-G, participants were asked to rate the degree in which 6 different stressor categories came to mind while completing the measure (*Stressor Salience*). The instructions were as follows: "We asked you a number of questions about how stress impacts you. We are interested in understanding what types of stressors people are thinking of when answering these questions. Please rate the degree to which the following stressors were on your mind as you answered questions about the effects of stress". Stressor categories (academic stressors, interpersonal stressors, identity-based discrimination, societal level stressors, financial stressors and illness/injury related stressors) were rated on a 5-point scale ranging from not at all to extremely.

To investigate student's beliefs about individual stressor types, we made slight variations to the specific Stress-Mindset Measure (SMM-S) (Crum et al., 2013) and repeated it to address six different stressor types including academic, interpersonal, and identity-based stressors. Specifically, we asked participants to imagine stressors in each specific category, and then to answer the stress mindset questions again for that specific class of stressors. For each of the six stressor categories, we included the full measure again, and adapted the wording to that specific

stressor. For example, one item was “The effects of financial stressors are positive and should be utilized.”.

Both of the SMMs have high internal consistency (Cronbach alpha of .80 for the SMM-G and .86 for the SMM-S) (Crum et al., 2013). In terms of discriminant validity, a Pearson correlation revealed that the SMM-G only had minimal correlations with other measures of stress, suggesting that the SMM-G is not redundant with the experience of stress (Crum et al., 2013). Lastly, stepwise multiple regression models found that stress mindset via the SMM-G is a significant predictor of health and life satisfaction above and beyond the effects of stress and other specific coping strategies (Crum et al., 2013).

Other measures

Additional measures were collected as a part of the larger study. These include measures of LGBTQ+ identity, ethnic identity, depression, resilience, perceived stress, distress intolerance, neuroticism, need to belong, self-liking, and social provisions.

Procedure

Participants were recruited through an advertisement blurb posted on social media sites such as Instagram and Facebook and were compensated with either a \$10 Amazon gift card or \$10 Target gift card (n = 89). We also sampled from introductory psychology students who were compensated with a research credit for their coursework (n = 93). Each participant was able to complete the study with an anonymous link that was emailed to them. The study consisted of a survey that took participants approximately 20-30 minutes to complete. An explanation of the purposes of this research was provided to each participant upon completion of the study during the debrief. Participants who randomly respond were discarded using 8 security questions such

as “What color is grass most likely to be?” and participants who answer less than 5 of these questions correctly were screened out of the final analysis.

Data Analysis Plan

We used repeated measures ANOVA to see if there were differences in responses to the 6 different stressor categories as it relates to the degree in which participants were thinking of them when completing the SMM-G (salience). First, we did this for the sample as a whole. Then, we ran this same analysis using race as a factor. Next, in order to see if there were any specific differences as it relates to identity, we split the file to run analyses for participants who identified as any minority group (racial/ethnic, sexual and/or gender minority) and ran a one-way ANOVA. We then split the file further so that we could run separate analyses for students who identify in racial, ethnic, sexual, and/or gender identity categories, also using one-way ANOVA. As it relates to the General Stress Mindset Measure, we then ran several one-way ANOVA for racial, ethnic, sexual and/or gender identity categories. We then performed a repeated measures ANOVA to see if there were differences in responses to the Stress Mindset Measure as it relates to 6 different stressor categories. We also ran ANOVAs to test whether there were identity-based differences in stress mindset ratings for the stressor categories.

CHAPTER 3

RESULTS

Descriptive Statistics

The Stress Mindset Measure General and Specific are scored by calculating the mean of all 8 items. Participants had an average score on the Stress Mindset Measure-General (SMM-G) of 1.75 with a standard deviation of .705. These stress mindset ratings suggest relatively low stress-is-enhancing mindsets compared to samples of fully employed Americans (M; 3.22, SD; 1.13) (Ben-Avi et al., 2018), employed Germans (M; 2.57, SD; .67) (Casper et al., 2017), and

similar to Australian undergraduate students (M; 1.71, SD; .66) (Kilby & Sherman, 2016). In terms of our specific stressor types, participants perceived academic stressors to be the most stress enhancing (M; 1.77, SD .77), whereas illness/injury related stressors were perceived as the least stress enhancing (M; .88, SD; .71). Identity-based stressors were perceived as the next least stress enhancing with a mean of 1.22 and a standard deviation of .77. Descriptive statistics for each stress mindset type can be found in Table 1.

Table 1

Stress Mindset Measure General & Specific

Stress Mindset	<i>M</i>	<i>SD</i>
General	1.75	0.71
Academic	1.77	0.77
Interpersonal	1.37	0.73
Identity-based Discrimination	1.22	0.77
Societal	1.76	0.70
Financial	1.17	0.74
Illness/Injury	0.88	0.71

After completing the SMM-G, participants were then asked the degree in which they were thinking about six different types of stressors while completing the measure. These six stressors include academic stressors, interpersonal stressors, identity-based stressors, societal stressors, financial stressors and illness/injury related stressors. In general, identity-based stressors were thought of the least (M; 2.09, SD; 1.230), whereas academic stressors thought of the most (M; 4.27, SD; .809) followed by interpersonal stressors (M; 3.20, SD; 1.216). Following interpersonal stressors were financial stressors (M; 3.11, SD; 1.40), and then societal stressors (M; 2.65 SD; 1.13). Lastly, the stressor type that was thought of second to last was illness/injury related stressors (M; 2.46, SD; 1.27). Detailed descriptive statistics for each stressor type can be found in Table 2.

Table 2*What Stressors Come to Mind When Asked about Stress Mindsets? Salient Stressor Types*

Stressor Types	<i>M</i>	<i>SD</i>
Academic	4.27	0.81
Interpersonal	3.2	1.22
Identity-based Discrimination	2.09	1.23
Societal	2.65	1.13
Financial	3.11	1.4
Illness/Injury	2.46	1.27

Stress Mindset – What Stressors Drive Responses?

We completed a repeated measures ANOVA in order to test what stress categories were most salient to participants as they completed the stress mindset measure. As shown in Figure 1, academic stressors were thought of significantly more than all other stress types (interpersonal, identity-based, societal, financial and illness/injury) ($p < 0.001$). Interpersonal stressors were thought of significantly more than all other following stressor types ($p < 0.001$) aside from financial stressors ($p > 0.05$). Next, societal stressors were thought of significantly more than identity-based stressors ($p < 0.001$), but not significantly more than illness/injury related stressors ($p > 0.05$). Lastly, identity-based stressors were thought of the least, as they came to mind significantly less compared to that of both illness/injury related and societal stressors ($p < 0.002$). Importantly, these results were moderated by race, ($F; 2.283, p < .001$). Greater detail on these findings for each stressor type, and details about the intercorrelation of our measure for salient stressor types, can be found in Figures 1 and 2 and Tables 3 and 4.

We ran several one-way ANOVA in order to test where there were differences in salience for our different stressor categories across identity groups. For participants who identified as any minority status (sexual, gender, race and/or ethnicity), our analyses provided

evidence of a significant difference in perceptions of identity-based stressors. Identity-based stressors came to mind significantly more for participants identifying as any minority status than our cisgender, straight, white participants ($F; 20.47, p < 0.001$), suggesting that minority status increases the salience of identity-based stressors when thinking about general stress mindsets. When analyzing specifically race as a factor, we found significant differences in the salience of identity-based stressors ($F = 10.55, p < 0.001$). A Tukey's-b post-hoc analysis revealed that individuals who identified as Black or as an "other" racial identity thought of identity-based discrimination significantly more than our White participants. When analyzing ethnicity specifically, our analysis provided evidence that there were significant differences in the salience of identity-based stressors ($F= 7.36, p < 0.05$). Individuals who identified as Hispanic thought of identity-based discrimination significantly more than our White participants. Lastly, as it relates to LGBTQ status, we found significant differences in the salience of identity-based stressors ($F= 10.22, p < 0.05$). In this case, individuals who identified as being of LGBTQ status thought of identity-based stressors significantly more than our cisgender straight participants.

Table 3

Correlations Between Stressor Type Salience Ratings

	Academic	Interpersonal	Identity-based Discrimination	Societal	Financial	Illness/Injury
Academic	1	0.10	-0.05	0.01	-0.10	-0.10
Interpersonal		1	0.35*	0.34*	0.20*	0.33*
Identity-based Discrimination			1	0.42*	0.40*	0.23*
Societal				1	0.48*	0.31*
Financial					1	0.20*
Illness/Injury						1

Table 3 Pearson Correlations for Salience of Stressor Categories. Note that * indicates the correlation is significant at the 0.05 level

Figure 1

Salient Stressor Types

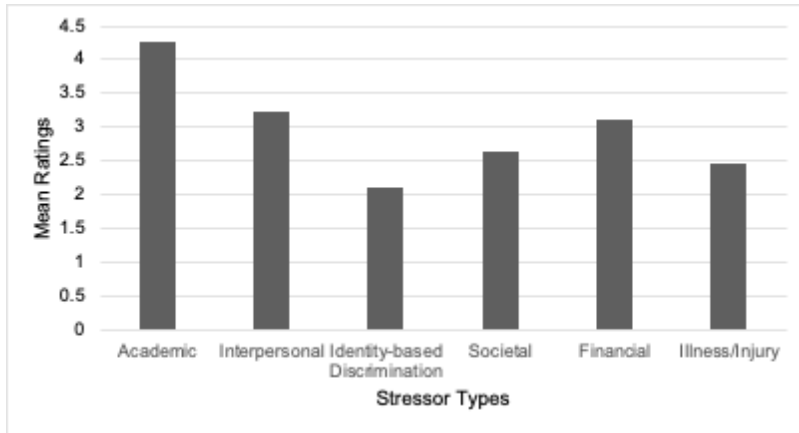


Figure 2

Salient Stressor Types X Race

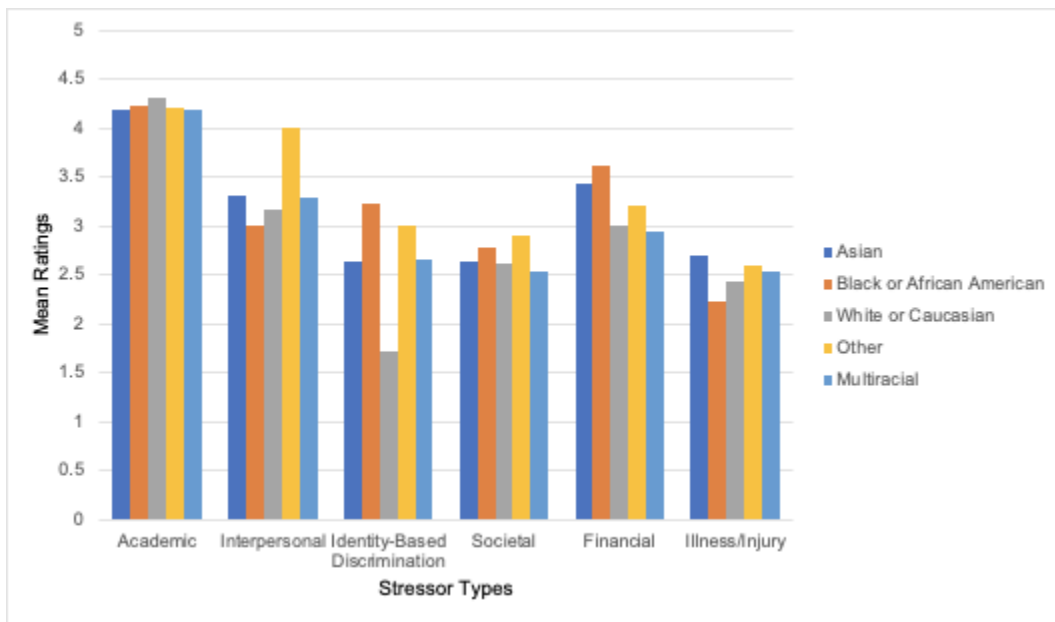


Table 4

Mean Differences Between Salience of Stressor Categories

	Academic	Interpersonal	Identity-based Discrimination	Societal	Financial	Illness/Injury
Academic	0	1.04*	2.17*	1.62*	1.16*	1.79*
Interpersonal		0	1.13*	0.58*	0.12	0.75*
Identity-based Discrimination			0	-0.55*	-1.01*	-0.38*

Societal	0	-0.46*	0.17
Financial		0	0.63*
Illness/Injury			0

Table 4 Pairwise comparisons for Salience of Stressor Categories. Mean differences shown, *shows the mean difference is significant at the 0.05 level

General Stress Mindsets

We also ran several one-way ANOVAs in order to test whether there were differences in general stress mindset ratings across different identity groups. There were no differences based on any minority vs. not, ethnicity, or LGBTQ status (all $p > .05$). Our one significant difference was found in running a one-way ANOVA with Race as a factor. Asian participants had significantly higher scores ($M = 2.13$) than Black participants ($M = 1.33$) ($F; 2.82, p < 0.05$). General stress mindset measures scores and specifics for race, ethnicity and LGBTQ+ status can be found in Table 3.

Table 5

Stress Mindset Measure-General Scores

Stress Mindset Scores	<i>M</i>	<i>SD</i>
Overall	1.75	0.71
Race		
Asian	2.13	0.66
Black or African American	1.33	0.68
White or Caucasian	1.73	0.72
Other	1.68	0.61
Multiracial	1.93	0.59
Ethnicity		
Hispanic	1.65	0.76
Non-Hispanic	1.76	0.70
Sexual/Gender Identity		
LGBTQ +	1.68	0.73
Non-LGBTQ+	1.78	0.70

Stress Mindsets for Specific Stressor Categories

We also conducted repeated measure ANOVA to test the difference between the stress mindsets towards the various stressor categories. Our analysis indicated that stressor categories have a significant impact on Stress Mindset Measure Specific (SMM-S) scores ($F; 70.31, p < 0.001$). Scores on the SMM-S were the highest for academic stressors, as academic stressors were perceived as significantly more stress enhancing than interpersonal, identity-based, financial and illness/injury related stressors ($p < 0.001$), but not societal stressors ($p > 0.05$). Following academic and societal stressors as the next most stress enhancing were interpersonal stressors, which were perceived as significantly more stress enhancing than financial and illness/injury related stressors ($p < 0.001$), but not identity-based stressors ($p > 0.05$). Next, identity-based stressors were perceived as significantly more stress enhancing than illness/injury related stressors ($p < 0.001$), but not financial stressors ($p > 0.05$). Lastly, illness/injury related stressors were perceived as significantly the least stress enhancing of the stressor types ($p < 0.001$). Greater detail on these findings for each stress mindset type can be found in Figures 3, and pairwise comparisons of each category can be found in Table 5.

Table 6

Correlations Between Specific Stress Mindset Ratings

	Academic	Interpersonal	Identity-based Discrimination	Societal	Financial	Illness/Injury
Academic	1	0.32*	0.32*	0.38*	0.33*	0.21*
Interpersonal		1	0.52*	0.33*	0.57*	0.46*
Identity-based Discrimination			1	0.45*	0.65*	0.55*
Societal				1	0.47*	0.39*
Financial					1	0.64*
Illness/Injury						1

Table 6 Pearson Correlations for Specific Stress Mindsets. Note that * indicates the correlation is significant at the 0.05 level

Figure 3

Stress Mindset Specific

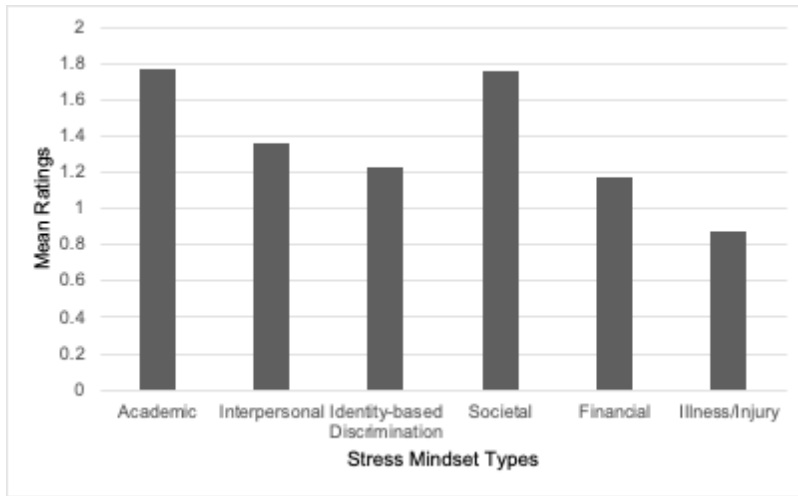


Table 7

Mean Differences Between Specific Stress Mindsets

	Academic	Interpersonal	Identity-based Discrimination	Societal	Financial	Illness/Injury
Academic	1.00	0.31*	0.47*	0.01	0.50*	0.78*
Interpersonal		1.00	0.15	-0.30*	0.18	0.47*
Identity-based Discrimination			1.00	-0.45*	0.03	0.32*
Societal				1.00	0.48*	0.77*
Financial					1.00	0.29*
Illness/Injury						1.00

Table 7 Pairwise comparisons for Specific Stress Mindsets. Mean differences shown. *shows the mean difference is significant at the 0.05 level

In order to analyze whether there were any significant differences between groups, we ran several one-way ANOVA for the 6 different Stress Mindset Measures for different identities. We first ran a one-way ANOVA for participants who identified as any minority status (sexual, gender, race and/or ethnicity). Our analyses provided evidence of a significant difference in perceptions of identity-based stressors. Participants who identified as any minority status perceived identity-based discrimination as significantly less stress enhancing than cisgender,

straight, white participants ($F; 3.198, p < 0.05$). With race as a factor, the only significant difference was found in interpersonal stressors ($F; 2.49$). We ran a Tukey's-b post-hoc analysis and found that Black and Asian participants had significantly different perspectives on interpersonal stressors ($p < 0.05$) as Asian participants perceived interpersonal stressors as significantly more stress enhancing ($M; 1.82$) than Black participants ($M; 1.05$). When running a one-way ANOVA with LGBTQ status as a between subject variable (meaning any sexual/gender minority participants versus cisgender straight participants), significant differences were found in identity-based and financial stressors. For identity-based stressors, LGBTQ participants thought they were significantly less stress enhancing than cisgender straight participants ($F; 18.48, p < 0.001$). A similar difference was found for financial stressors, as LGBTQ participants perceived them as significantly less stress enhancing than cisgender straight participants ($F; 4.64, p < 0.05$). These findings suggest that LGBTQ identity is associated with more negative stress mindsets related to identity-based and financial stressors.

CHAPTER 4

DISCUSSION

The present study examined the types of stressors that people think of when considering stress mindset, and whether there are differences in perceptions of how enhancing versus debilitating specific stressor categories tend to be. We were particularly interested in whether people view identity-based stressors as less stress-enhancing when compared to other types of stressors, and whether people who identify as racial/ethnic, sexual and/or gender minority group members especially share this viewpoint. Our findings provide evidence that (1) not all stressor types have equal influence in driving “stress mindset” ratings, and (2) different stressor categories do elicit different stress mindsets.

Our first question was whether different stressor types come to mind at different rates when discussing general stress mindsets. Our analyses indicated that there were significant differences in the degree to which specific stress categories were thought of when participants were asked about their stress mindsets. These significant differences provide evidence that differential stressor types vary in their salience when asked general questions about stress mindsets. In our general sample, academic stressors were thought of the most, whereas identity-based stressors were thought of the least. We suspect that a partial explanation for academic stressors being ranked the highest is that our sample consisted of college students. Academic and interpersonal stressors have been found, not surprisingly, to be especially prominent in college samples (Bulo & Sanchez, 2014). Perhaps samples with greater occupational diversity may see different results as it relates to stressor salience. Our findings may also be explained by the actual items that are utilized in the stress mindset measure. 4 out of the 8 items on the stress mindset measure, such as “Experiencing stress enhances/inhibits my performance and productivity” or “Experiencing stress enhances/inhibits my learning and growth”, might arguably be more relevant for performance-based stressors such as work or academics. It will be important for researchers to understand that when participants are discussing stress mindsets, their beliefs about stress will likely be particularly influenced by their beliefs about academic stressors.

Further analyses provided evidence that identity is a potential moderator in the degree to which specific stressors are salient when thinking about stress mindsets, as we found significant differences in the salience of identity-based stressors across groups. Our analysis provided evidence that race was a potential moderator for stressor category salience. Our analysis also showed that identity-based stressors came to mind significantly more for participants identifying as any minority status (sexual, gender, race and/or ethnicity) than our cisgender, straight, white

participants. Our one-way ANOVA analyses showed that race, ethnicity and LGBTQ status all significantly impacted the salience of identity-based stressors where those in the minority group thought of them more than participants who did not identify as one of these minority groups. This relationship supports our notion that there are certain stressors that would tend to be more relevant for those belonging to a racial/ethnic, sexual and/or gender minority group. Stigma- and identity-based stress, for example, is a form of stress that has disproportionately negative impacts on racial/ethnic, sexual and/or gender minorities (Vargas et al., 2020). This moderating effect can have important implications on how we think about stress mindsets in research and applied settings. It is important to note that for individuals with minority identities, there could be more cognitive influence of identity-based stressors when rating stress mindsets, and this could ultimately influence scores on stress mindset measures. As most African Americans report having experienced racial discrimination at some point in their life (Alio et al., 2020), and the perception of racial discrimination provides burdens that make life more difficult for racial/ethnic minorities through multiple channels (Broman et al., 2000), it would at least partially explain why the salience of this form of stressor could potentially impact stress mindset scores for people of color. This effect that race, ethnicity, sexual, gender and/or any minority status has on stressor-type salience allows us to infer that 1) people are not all thinking about the same types of stressors when thinking about the effects of stress, and 2) some stressors are more and less salient for individuals of different identities.

We also analyzed how identity might have impacted general stress mindset scores. Our analyses provided evidence that identity did indeed play a role. As it relates to race, there were significant differences in stress mindset scores between Black and Asian participants. For general stress mindsets, we found that Asian participants had significantly higher scores on the

stress mindset measure than Black participants. There could be due to systemic differences in the experience of stress, or cultural differences in how people conceptualize the effects of stress. In the future, it would be helpful to replicate this finding and research the specific mechanisms underlying the effect.

Our second question was whether various stressors categories elicit different stress mindsets. Scores on the SMM-S were not the same across the six different stressor types. Identity-based, financial and illness/injury related stressors were perceived to be the least stress enhancing forms of stressors, whereas academic, societal and interpersonal stressors were perceived to be the most stress enhancing, in that order. Perhaps there are some similarities in the features of the lowest categories: identity-based, financial and illness/injury related stressors. Although we do not have data on stressor appraisals, it is possible that there is less perceived controllability in facing identity-based discrimination, financial hardship, or injury/illness. Research suggests that perceived control has a buffering effect on the relationship both acute and chronic stressors and depression (Grote et al., 2007). It has also been found that greater perceived control over time on academic stress is associated with lower stress levels and better performance in college students (Nonis et al., 1998). On the other hand, events that are perceived as uncontrollable are more likely to lead to post-traumatic stress (Frazier & Steward, 2001). Stressors that are perceived to be less controllable would likely be deemed as more threatening given that people might feel less confident of resources to meet the demands of the stress (Crum et al., 2017), therefore leading to a less stress enhancing mindset. The notion that, in general, identity-based stressors are perceived as less stress-enhancing when compared to other types of stressors was supported through this analysis. However, we did not anticipate illness/injury-related stressors to be perceived as significantly less stress enhancing. This effect could be

explained by not only perceived control, but also by history effects. Participants completed our study during the COVID-19 pandemic where illness and illness-related mortality were especially uncontrollable and rampant. Hence, in the future, it would be interesting to compare these ratings to those made in a time that is not characterized by global pandemic.

As it relates to the 6 different SMM-S scores, our analyses provided evidence that identity played an important role. As it relates to race, there were significant differences in stress mindset scores for interpersonal stressors. For interpersonal stressors we found that Asian participants had significantly higher scores on the stress mindset measure than Black participants. Yet again, there could be cultural differences in how stress is experienced and how people conceptualize the effects of stress. In the future, it would be helpful to replicate this finding and research the specific mechanisms underlying the effect.

We also found differences when we compared participants who belonged to any racial/ethnic/gender/sexual minority group. Although there are clear limitations in such a broad grouping, we thought that it might be helpful to consider whether there are differences in ratings among those who are more likely to face identity-based stressors. Participants who belonged to any minority group perceived identity-based stressors to be significantly less stress enhancing in comparison to cisgender, straight, white participants. It is important to consider the implications that people who identify as racial, ethnic, sexual, or gender minorities might have different perceptions of the effects of discrimination from those who identify as white, straight, and cis gender. It is possible that the latter group might underestimate the negative effects of identity-based stressors.

As it relates to LGBTQ status, participants who identified as LGBTQ rated identity-based and financial stressors to be significantly less stress enhancing than did cisgender straight

participants. Individuals of LGBTQ status are more likely to face micro-aggressions than their heterosexual cisgender counterparts (Vargas et al., 2020), which may partially explain why LGBTQ participants view identity-based discrimination as less stress enhancing. The literature on the Rejection Sensitivity Model also helps explain this finding as it relates to identity-based stressors, as discrimination in the form of micro-aggressions can be exacerbated with previous experiences of rejection and prejudice, creating a greater sense of reactivity to specific interpersonal stressors (Feinstein, 2020). Stressors, such as identity-based discrimination or financial stress, may lead to their own source of rejection and prejudice. This could partially explain why LGBTQ individuals, who might be particularly in tune to rejection, would perceive these forms of stress as debilitating.

Limitations

The present study had a few notable limitations. First and foremost, we had a relatively low sample size of minority participants that ultimately impacted the power of our analyses. We had particularly low numbers of Black, Asian and Multiracial participants ($N < 20$ each). As it relates to LGBTQ status, we had gender and sexual minority categories that were not well represented in our sample such as men who have sex with men, transgender, gender non-conforming and/or non-binary individuals. Our findings related to LGBTQ identity may be most applicable to bisexual and queer individuals because they were the most prevalent groups in our sample. We considered recruiting explicitly for specific identity-based groups. However, we saw a major limitation to that approach. We worried that recruiting for a specific group might prime participants in that group to think of identity-based stressors when filling out the questionnaires. So, our approach was to try to get a relatively large sample and hope that we had good representation in the sample.

We also note that while we tested effects for identity based on race, ethnicity, and sexual/gender minority, there are people with other identities that systemically face discrimination and identity-based stress. For example, we did not assess identities related to religion or disability.

Further, we note that although we tested the effects for identity based on race, ethnicity, and sexual/gender minority, we fail to analyze the impacts of intersecting identities. There is overlap among these various identities, which may impact an individual's stress mindset ratings and the degree in which specific stressor categories come to mind. We fail to tease apart the impact of overlapping various minority identities.

Ideally, we would have also tested for moderation effects, particularly around identity measures. It is likely that how strongly one identifies with their racial or ethnic identity (MEIM; Phinney, 1992), or how positively they feel about their LGBTQ identity (LGB-PIM; Riggle et al., 2014), could impact the degree to which identity-related stressors are viewed as enhancing or debilitating. Unfortunately, we decided that such analyses would not be appropriate given our somewhat low sample size of racial/ethnic minority participants and LGBTQ participants. Given the sample size of specific subgroups, we thought that it was best to keep analyses to main effects models. It also would have been interesting to consider not only main effects of specific identities, but also intersecting identities. Again, with such a small sample, there is a degree of nuance we were unable to analyze. Future research is needed to further examine the role that identity plays in stress perceptions, as well as potential moderators, in a larger sample of participants from various minority identities.

There were a few other limitations. Our study asked about very broad stressor categories, such as financial and societal stressors, so it is not clear how it would relate to momentary

perceptions of the stress-is-enhancing or stress-is-debilitating effects in response to everyday stressors. We also retrospectively asked about the degree in which stressors came to mind when completing the SMM-G. Although we asked immediately after participants completed the measure, it is worth noting the limits in the degree in which participants would be able to accurately recall which stressors they were thinking about. We also note that there has not been any research testing whether there is differential validity of the SSM scales across racial/ethnic groups. Our sample also consisted of primarily college students in Washington D.C, which limits the degree in which we can extend our findings to the general population. This study was also conducted during the global COVID-19 pandemic, which may have impacted findings as it relates to stressor salience and stress perceptions.

In conclusion, the present study provides evidence that we should not treat stress as one overall broad concept when talking about stress mindsets. These different stressor categories can 1) differ in the degree in which they drive broad stress mindset ratings, and 2) can elicit different stress mindsets. The difference in salience of various stressor types is an important concept to consider when we discuss stress mindsets, particularly for those who identify as a racial, ethnic, sexual, or gender minority. These individuals tended to think of identity-based stressors more often when rating stress mindsets, and identity-based stressors were viewed as more debilitating by them. It will be important for stress researchers to understand this nuance in stress mindsets and consider how systemic differences in stressor features and personal identities can impact these ratings. As we increase our understanding about this nuance, we can look to modify stress mindset interventions and the way that we talk about stress mindsets in clinical practice. These findings, as well as the future findings related to nuance of stressor categories, will allow us to form culturally competent interventions that can serve diverse populations. We might talk about

stress as a broad concept, but also bring in a nuanced discussion of how individual stressor types and patterns of experience with stressor types (e.g., based on an individual's identity) can shape stress mindsets. This might allow deeper reflection on the specific mindsets one has about specific types of experiences they encounter.

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