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The Effects of Stress Mindset Interventions on University Students' Health and Functioning

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## Abstract

In modern society, the overwhelming cultural narrative proclaims that stress is detrimental to health and should be limited and avoided at all costs. However, recent research has demonstrated that it is one's stress *mindset*, rather than their stress level, that determines the psychological and physiological outcomes. Mindsets are lenses that simplify and order the world, and have been proven to influence daily behavioral and physiological responses to create cascading effects. Recent research has demonstrated that one's mindset about stress is the demining factor in health, performance, and productivity in response to stressful conditions, and that these mindsets can be manipulated via intervention training programs. Given the increasingly high stress levels of university students and the common mindset that stress is debilitating to health and performance, university students are excellent candidates for mindset interventions. The present study examines the feasibility and impact of a mindset intervention for university students and tracks their academic and psychological functioning over the course of the year. Additionally, this study examines the effect of mindset interventions on students' willingness to grow from stressful experiences. Results indicates that stress mindset intervention training has a significant effect on students' mindsets about their stress, and that these effects last over time. However, results fail to indicate that a stress mindset intervention significantly impacts students' willingness to grow from potentially stressful experiences.

### The Effects of Stress Mindset Interventions on University Students' Health and Functioning

In modern society, the overwhelming cultural narrative proclaims that stress is a negative force, and should be reduced and avoided at all costs. Though stress a normal part of life, high levels of stress and chronic stress are villainized (Bethune, 2014). This has created panic about stress, spawning an entire self-help industry aimed at reducing and avoiding all stressors. This panic may be warranted: chronic stress has been linked to the six leading causes of death (Crum, Salovey, & Achor, 2013), absenteeism from work and decreased productivity (Aktinson, 2004; Schneiderman, Ironson, & Siegel, 2005), as well as cognitive impairment, depression, mental illness, increased aggression, and relational conflict (Crum et al., 2013). In 1998, 30,000 American adults were asked how much stress they experienced in the past year, and results revealed a high level of stress increased their risk of dying by 43% (Keller 2011). However, this study also measured these adults' *perceptions* of their stress, and found this increased risk of death only applied to those who believed stress was harming their health. Those who reported high levels of stress and didn't believe it harmed their health were no more likely to die than those with low levels of stress. In fact, those who had high stress levels but who did not believe this stress negatively impacted their health had the lowest risk of death out of anyone in the study (Keller, 2011). This study revealed an important inconsistency: stress can be debilitating for some people, harming their health, performance, and productivity, and it can be enhancing in these same domains for others. Further research has confirmed this finding: it is not the amount of stress but the perspective on this stress that determines the health outcomes.

Stress can be generally defined as "the experience of anticipating or encountering adversity in one's goal related efforts" (Crum et al. 2013). The physiological arousal of the stress response is an evolutionary response to threats that prepares the body to act (McGonigal, 2015).

While these physiological responses can produce the previously mentioned negative health effects related to stress (e.g. death, aggression), they can also produce an increased performance during times of high stress. The best performers in each field – surgeons, athletes, musicians, and others – are not physiologically calm under pressure, but rather exhibit these stress response symptoms that allow them to perform at this high level (Pfeifer, 2012). This is because the stress response is evolutionarily designed to promote high performance, whether that be our ancestors escaping a predator or modern athletes scoring a game-winning goal. While the stress response can be detrimental to health, it can also promote activity, vitality, and success.

This is known as the stress paradox: stress can be debilitating for some, causing disease, and enhancing for others, promoting health and performance. Recent research has indicated these physiological effects depend on one's *mindset* about their stress. A mindset is a sort of lens through which to process information, which orients an individual towards a particular way of processing experiences and guides one towards corresponding behaviors (Crum et al., 2013, adapted from Dweck 2008). These can be small scale and situation specific (a belief like “I get enough exercise through my current job as a landscaper”) or large scale and ubiquitous (beliefs like “Money won't buy happiness” or “People are inherently good”). Research has shown mindsets regarding ideas like aging and learning have significant effects on health and functioning outcomes (Levy, Zonderman, Slade & Ferrucci, 2009; Blackwell, Trzesniewski, & Dweck, 2007). Mindsets are pervasive and guide corresponding actions. Though they may be simple, mindsets are not inconsequential, but rather have cascading results with immense effects on psychological and physiological functioning.

The importance of mindsets has influenced a plethora of research into how we can manipulation mindsets to benefit individuals. One line of research suggests mindsets may be

altered via brief interventions challenging the previously held beliefs by presenting research and/or counterexamples from one's own life. Rather than directly manipulating the individual's held mindset (i.e. telling participants that stress is good for them), participants can be walked towards an effortful and purposeful change of mindset by presenting them with research and information on mindsets, the physiology of the stress response, and through strategies to help them reframe their own stress mindset. This type of intervention places the power in the hands of the participant, who, after receiving the factually accurate research, can work towards changing their previously held beliefs. Mindset interventions like these are remarkably effective, and the change in mindset persists even after the intervention itself has been forgotten (Walton & Cohen, 2011). The message of the intervention – the new mindset – is internalized, and takes hold and flourishes even without conscious activity or memory of the intervention, leading to more positive outcomes for the individual.

The entire concepts of a “mindset” is a relatively new idea; however, much of the theory behind mindsets draws from cognitive psychology. According to this school of thought, humans function primarily as creators and seekers of meaning and as such, we tend to impose organizational patterns on internal and external events. We then draw conclusions about ourselves and the world by combining encountered information with these patterns to organize and classify events (Berlin, 2002, 3). We create schemas, or memory processes, that organize sensory and semantic cues into meaningful themes or patterns of experience (Berlin, 2002, 4). Different people develop and impose different schemas on similar events. We develop schemas through storing recurring patterns in our memories, and continuously drawing on them in new situations so that they become increasingly accessible and eventually operate at a nearly automatic level. The more these patterns are called upon, the more general they become, and

soon just a few bits of information are enough to automatically call to *mind* an entire *set* of feelings, thoughts, and actions associated with a particular schema, thus creating a mindset.

While mindsets are automatic, they can be changed. Changing one's mindset takes effort because it is not routine to intentionally create an alternative mental pattern. While it can be difficult to attempt this sort of conscious control, as compared to following automatic impulses, consciously modifying schemas is a method towards changing one's cognitive-emotional experience. One way to change a mindset is through interventions designed to lead to effortful creations of new thought patterns that will eventually become as internalized and automatic as the previously held belief.

The reason that an individual may want to change their stress mindset is because there are two dominant mindsets regarding stress. An individual can either believe stress is enhancing in their life and creates positive health benefits, or stress is debilitating in their life and is detrimental to their health. People tend to act in ways consistent with their belief and thus experience the corresponding health benefits or detriments. Research supports this dichotomy, and one study demonstrated the immense differences between these two mindsets in participants from a high stress workplace, a global financial firm during the height of the 2008 recession (Crum, Corbin, Brownell, & Salovey, 2011). In the study, participants watched three videos detailing either the beneficial effects of stress or the detrimental effects of stress. Compared to control participants who watched no videos and those who watched the videos on the debilitating effects of stress, just three weeks later subjects who watched the videos on the benefits of stress were less anxious, less depressed, had fewer health problems, and exhibited better focus, engagement, collaboration, and productivity at work, even amid the high stress environment of the financial crisis (Crum et al., 2011). While the participants who watched the videos on the

benefits of stress did not reduce their stress, they reframed their stress, and this reframing (a shift in mindset) allowed them not only to avoid the negative effects, but to use their stress as a tool to increase their productivity and health. This research supports the idea that mindsets may be altered.

In another study on mindsets, participants were told some of them would be randomly selected to give an impromptu speech and would be rated by their peers on traits like charisma and likability (Crum et al., 2013). The act of receiving feedback is an opportunity for positive personal growth, but is also a stressful experience in that negative feedback can threaten self-esteem and lead to increased anxiety and stress (Levy, Albright, Cawley, & Williams, 1995). Researchers found the participant's mindset about stress was the determining factor in predicting a desire to receive feedback, beyond other variables such as cortisol level and perceived stress of the experience. These findings indicate a stress-is-enhancing mindset has significant effects on ones' goal-related efforts and willingness to grow from a stressful experience.

One area previous research has failed to address is the feasibility and effects of this kind of intervention for university populations. Over half of surveyed university students reported their academic obligation are either very difficult to handle or traumatic, and a quarter indicated stress negatively impacts their academic performance (American College Health Association, 2018). Furthermore, over 90% of students reported one or more physical or emotional symptom of stress in the past month, and over half reported multiple unhealthy stress-related behaviors like insomnia and overeating (APA, 2018). According to researchers, university students' level of stress has increased in recent decades, with students who frequently felt overwhelmed by all they needed to do skyrocketing from 14% in 1985 to 41% in 2016 (Astin, Green, Korn, & Schalit, 1985; Eagan, Stolzenberg, Zimmerman, Aragon, Sayson, & Rios-Aguilar, 2016).



According to the APA, these same students clearly overwhelmingly endorse a stress-is-debilitating mindset. College-age Americans consider their own level of stress to be several points higher than the maximum “healthy” level of stress, indicating the majority believes their own stress level is unhealthy and debilitating to their health (APA, 2018). One quarter of respondents indicated they do not do enough to manage their stress on a daily basis, further implying that they believe their stress is unhealthy and needs to be reduced (APA, 2018). All of this indicates that stress has become an increasingly problematic issue for American college students, who not only experience high levels of stress but also believe it to be detrimental to their health and academic success.

These findings suggest that university students are excellent candidates for a stress mindset intervention. The present research tests the feasibility and impact of a stress mindset intervention with a university population. This research examines both long-term effects of a mindset intervention (9 months later), as well as the short-term effects of a mindset intervention on students willingness and comfort to engage in stressful experiences that provide capacity for personal growth. I predict that a stress mindset intervention will induce a more stress-is-enhancing mindset in students, and that these results will maintain consistent over the course of the year as their mindset is internalized. Furthermore, I predict that students who receive a stress mindset intervention will be more willing to engage in and grow from potentially stressful experiences.

### **Study 1**

This study aims to test the long-term effects of stress mindset intervention training by providing intervention training, and tracking students over the course of an academic year in terms of stress mindset, perceived stress, and academic performance.

## Method

### Participants

Participants were 34 undergraduate students from a small Midwestern university. Participants who dropped out after time point 1 were removed (15 participants removed). Participants completing at least two of the three time points were 19 females and 0 males, ranging in age from 18-22 ( $M=19.53$ ). Participants were recruited in a variety of psychology classes, and were offered class credit and pizza for the initial survey completion, and entered in a gift card raffle for each subsequent survey completion.

### Measures.

The *Stress Mindset Measure (SMM)* is an eight-item scale that measures an individual's current stress mindset (SM) (Crum et. al, 2013). The SMM has good reliability (0.87). Responses are scored on a five-point scale, ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). The SMM score is calculated by reverse scoring four negative items (eg: "The effects of stress are negative and should be avoided."), and averaging these together with the scores of the four positive items (eg: "Experiencing stress facilitates my learning and growth.") for an overall stress mindset score.

The *Perceived Stress Scale (PSS)* is a ten-item scale that measures the degree to which an individual perceives the situations in his/her life as stressful (Cohen, Karmarck, & Mermelstein, 1983). The PSS has good reliability (0.85). Responses are scored on a five-point scale, ranging from 0 (*never*) to 4 (*very often*). The PSS score is calculated by reverse scoring the four positive items (eg: "In the last month, how often have you felt confident about your ability to handle your personal problems?") and then averaging these with the six negative items (eg: "In the last

month, how often have you been upset because of something that happened unexpectedly?") to obtain an overall perceived stress score.

The *General Self-Efficacy Scale (GSES)* is a ten-item scale that assesses self-efficacy and predicts coping with daily hassles and adaptation after stressful life events (Schwarzer & Jerusalem, 1995). The GSES has relatively good reliability (ranging from .76 - .9). Responses were measured on a five-point scale, ranging from 0 (*not true at all*) to 4 (*exactly true*). The GSES score is calculated by averaging the score of each question (eg: "I can always manage to solve difficult problems if I try hard enough.") to obtain an overall self-efficacy score.

The *Perceptions of Academic Stress Scale (PASS)* is an eighteen-item scale that measures perceived sources of academic stress among university students (Bedewy & Gabriel, 2015). The PASS has relatively good reliability (0.7). Responses were measured on a five-point scale, ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). The PASS score is calculated by reverse scoring the five positive items (eg: "I am confident that I will be a successful student.") and then averaging these with the thirteen negative items (eg: "My teachers are critical of my academic performance.") to obtain an overall academic stress score.

## **Design**

Study 1 experiment utilized two levels of stress mindset training: stress-is-enhancing and stress-is-debilitating. Each participant was randomly assigned to one of these two levels of training. Participants completed the SMM, PSS, GSES, PSAS, and several questions on their current level of stress at three different time points: directly before their mindset training, at the end of the first semester, and halfway through the second semester. The first set of surveys was completed in person and the second two sets were online.

**Procedure**

Participants were informed that the study is about students' perceptions of their stress and the long term academic and health outcomes of this stress. They were assured all of their responses would be completely anonymous and their reflection responses would not be collected. After completing the surveys, participants in the stress-is-debilitating condition (N=15) watched a series of three videos on the detrimental effects of stress (taken from Stanford University Mind & Body Lab, used in Crum et. al., 2013). These videos served to reinforce the culturally dominant narrative that stress is debilitating and should be both reduced and avoided. Each video explained and gave examples of the negative consequences of high stress levels, in terms of health (video one), performance (video two), and learning/growth (video three). After each video, participants answered two questions on a provided worksheet that encouraged them to reflect on how they had seen these same negative effects of stress in their own lives. Worksheets were not collected; the purpose was merely to encourage self-reflection and connection to participant's own life and current situations.

Participants in the stress-is-enhancing condition (N=19) completed an adapted version of Stanford University Mind & Body Lab's ReThink Stress Mindset Intervention (Stanford University Mind & Body Lab). Though shortened slightly from the original version due to time constraints, this mindset intervention consists of a series of videos and reflection exercises. The videos explain the science of stress, the power of mindsets, and detail studies showing the significance of stress mindsets. Then, the videos explain a three-step process to shift one's mindset about stress (acknowledge, welcome, and utilize stress), and includes short written reflection exercises to practice these steps in participants' own current stressors. The videos also offer suggestions for ways to integrate these steps into daily life, eventually becoming an

internalized mindset. Participants in the stress-is-enhancing group were encouraged to utilize these techniques in their daily life. The reflection packets were not collected.

Participants received pizza and class credit as compensation for their time, and were informed that they would receive surveys via email at two more time points during the year. At the end of the semester, participants were emailed a set of anonymous surveys informed they would be entered in a gift card raffle for their completion of these surveys. Halfway through the second semester, participants were again emailed this set of anonymous surveys and informed that they would again be entered in a gift card raffle if they complete the surveys.

### Results

Several paired samples t-tests were conducted to calculate differences in stress mindset (SM) between control and experimental participants across time. The independent variable was training condition (stress-is-enhancing or stress-is-debilitating) and the dependent variable was SM score, matched across time points.

**Stress-is-debilitating training stress mindset.** A paired samples t-test was conducted to compare the SM of stress-is-debilitating training participants between time points (1 and 2, 2 and 3, 1 and 3). There was no significant change in SM between time point 1 ( $M = 1.54$ ,  $SD = 0.61$ ) and time point 2 ( $M=1.88$ ,  $SD=0.59$ ),  $t(7)=-1.40$ ,  $p=0.204$ , between time point 2 ( $M=1.88$ ,  $SD=0.73$ ) and time point 3 ( $M=1.41$ ,  $SD=0.64$ ),  $t(3)=3.00$ ,  $p=0.058$ , or between time point 1 ( $M=1.16$ ,  $SD=0.47$ ) and time point 3 ( $1.41$ ,  $SD=0.64$ );  $t(3)=-.058$ ,  $p=0.604$ . At each time point, the average SM for control participants leaned towards a more stress-is-debilitating mindset (ranging from 1.4 to 1.8 on a 0-4 scale).

**Stress-is-enhancing training stress mindset.** A paired samples t-test was conducted to compare the SM of stress-is-enhancing training participants (those who had received training)

between time points. This revealed a change hovering on the edge of significance in SM between time point 1 ( $M = 1.92$ ,  $SD = 0.69$ ) and time point 2 ( $M = 2.40$ ,  $SD = 0.40$ );  $t(8)=-2.292$ ,  $p=0.051$ . There was no significant change in SM between time point 2 ( $M=2.44$ ,  $SD=0.46$ ) and time point 3 ( $M=2.34$ ,  $SD=0.74$ );  $t(6)=0.548$ ,  $p=0.604$ ; or between time point 1 ( $M=2.01$ ,  $SD=0.65$ ) and time point 3 ( $M=2.33$ ,  $SD=0.95$ );  $t(11)=-1.24$ ,  $p=0.241$ . Average SM moved more towards a stress-is-enhancing mindset from time point 1 to time points 2 and 3.

**SM, stress level, and feeling equipped to handle stress.** In the control group, there was no significant correlation between SM at any time point and stress level (SL) at any time point, or feeling equipped to handle stress (SE) at any time point. In the experimental group, SM at time point 3 was significantly correlated with SE at time point 2,  $r(7)=0.943$ ,  $p=0.002$ , and at time point 1,  $r(12)=0.771$ ,  $p=0.003$ . Training was not significantly correlated with students' perceptions of academic stress (PAS), general self-efficacy (GSES), or grades,

### Discussion

This study attempted to test the feasibility and effects of stress-is-enhancing mindset training on students' stress mindset and academic functioning over the course of the year. As hypothesized, students who received stress-is-enhancing mindset training had a nearly significant shift in SM between time point 1 (pre-training) and time point 2 (post-training). Their perceived stress did not significantly change, but rather their mindset shifted. Additionally, students with a more positive SM (due to training) felt significantly more equipped to handle stressors in their lives.

However, contrary to hypotheses, this training effect did not maintain between time points 2 and 3. In fact, students had a marginally *less* stress-is-enhancing mindset at time point 3 (SM avg. 2.34) than they did at time point 2 (SM avg. 2.45), and there was no significant

difference between students' initial stress mindsets at time point 1 (pre-training) and their final stress mindsets at time point 3.

These results indicate that stress-is-enhancing mindset training does have a nearly significant effect on students' stress mindset. The near significance is likely due to a small sample size, and would likely be more significant with more participants. However, results fail to indicate that a stress-is-enhancing mindset intervention is internalized and held long-term, as there was no significant change between time points 2 and 3, or between time points 1 and 3. This is likely due to the initial mindset training decaying over time due to a lack of frequent practice of the new stress mindset. While new mindsets can become internalized and automatic, this is an effortful process, and thus it is likely that students who did not frequently practice or review their training experienced a decay in stress-is-enhancing mindset over time and reverted to their previously held, stress-is-debilitating mindset. This study should be repeated with more consistent training review to ensure the mindset training strategies and theory remains present and active in participants' minds.

Additionally, the small overall sample size and high attrition rate (15 of 34 participants dropped out after time point 1) are marked weaknesses that lessen the statistical power. Thus, this study should be repeated with a larger and more consistent sample size to achieve a more accurate and complete picture of the long-term effects of stress mindset training.

## **Study 2**

This study aims to evaluate the effect of stress mindset intervention training on students' willingness to grow from stressful experiences by providing stress mindset training, and then measuring students desire for feedback from a potentially stressful experience.

## Method

### Participants

Participants were 42 undergraduate students from a small Midwestern university with 29 females, 12 males, and 1 non-binary. They ranged in age from 18-22 ( $M=18.9$ ), and 36 of the 42 participants were in their first year of college, with 4 participants in their second year and 2 in their fourth year. Participants were recruited from an introductory psychology lecture class, and were offered 30 points of extra credit in this class for their full participation.

### Measures

The *Stress Mindset Measure (SMM)* and the *Perceived Stress Scale (PSS)*, as described in Study 1.

A *modified Trier Social Stress Test (TSST)* was used to induce stress in participants (Crum et al., 2013). Unlike the standard TSST, participants did not actually complete any public speaking tasks, but rather had this anticipation induced while completing self-response questions.

Several *self-response questions* assessed participants comfort with the task and willingness to receive feedback (Crum et al., 2013). Comfort and willingness to give speech were on a nine-point scale, ranging from 1 (*not comfortable/not willing*) to 9 (*very comfortable/very willing*). Participants also responded to questions addressing their desire for feedback from peers (Yes/No), their desire to receive personalized feedback from the career center (Yes/No), and their desire to have a career center appointment schedule (Yes/No).

### Procedure

After giving a verbal informed consent, participants first completed the SMM and the PSS. Then, in a modified TSST participants were informed that they would be completing a short public speaking exercise (adapted from Crum et. al, 2013). They were instructed that five



of them would be randomly selected to give a five-minute speech on why they would be the ideal candidate for their dream job. They were told those selected would be given three minutes to prepare before this speech. They were further instructed that they had several options to receive feedback on their speech and interviewing techniques: if they were selected to give this speech, they would have the option to receive written constructive feedback from their peers to help them improve their public speaking and interviewing techniques. They could also have their speech videotaped and receive personal feedback from the Campus Career Center. If they were not selected to give a speech, they had the option to request an appointment with the Career Center to complete this exercise.

After indicating their level of comfort being selected to give a speech and their willingness to be the one selected to give a speech. They also indicated if the desired feedback from their peers, or from the Career Center, either videotaped or as an individual appointment at a later date. After responding to these questions, participants were informed they would not actually be giving a speech and debriefed on the experiment. They were directed to the Career Center for help with their public speaking or interviewing, and to the Campus Health Center and Counseling Center for any sort of physical or psychological distress.

Because data collection occurred in two distinct sessions, those in the second session indicated if they had already known they would not actually be giving a speech. Data was excluded from those who indicated they had been informed of the nature of the experiment.

### **Results**

We ran several correlations examining the effect of training on participants' comfort giving a speech, willingness to give a speech, and desire for feedback. In these correlations, participants training condition (training or no training) was the independent variable, and their

stress mindset (SM), perceived stress (PS), comfort level (1-9), willingness level (1-9), desire for peer feedback (Y/N), desire for career center feedback (Y/N), and desire for a career center appointment (Y/N) were the dependent variables.

All 42 participants were included in results. No participants in the later section indicated that they had already known what the study was about, and thus no results were excluded from analyses. Preliminary analyses revealed a significant correlation between Gender and PS,  $r(42)=.344, p=.026$ . All further analyses controlled for gender.

**Effects of training.** An independent samples t-test revealed that stress mindset training significantly impacted participants' SM score,  $F(38)=.408, p<.001$ . This same training did not significantly affect participants' PS scores,  $F(38)=1.563, p=.388$ . Further t-tests revealed no significant differences between the two training groups in any of the other dependent variables,  $p>.05$ .

Table 1.  
*Means, standard deviations, and Pearson's correlations.*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Willingness to give speech	3.43	1.61				
2. Comfort giving speech	3.14	1.51	.849**			
3. Perceived stress of experience	3.76	1.69	-.346*	-.502**		
4. Stress Mindset (SM)	1.95	.65	.256	.205	-.022	
5. Perceived Stress (PS)	1.98	.66	-.130	-.241	.162	-.080

\*Correlation significant at the .01 level (2-tailed)

\*\*Correlation significant at the .001 level (2-tailed)

**Correlations.** See Table 1. Participants willingness to give a speech was significantly positively correlated with their comfort giving this speech,  $p<.001$ . Participants perceived stress of the experience was significantly negatively correlated with both their willingness to give a

speech,  $p=.025$ , and with their comfort giving a speech,  $p=.001$ . Neither participants' SM scores nor their PS scores were significantly correlated with any other relevant variable.

**Desire for feedback.** *See Table 2.* Spearman's correlations revealed significant correlations between desire for feedback in different realms. Participants desire for career center feedback was significantly positively correlated with their desire for peer feedback,  $p=.002$ . Participants' desire for career center feedback was also significantly positively correlated with their desire for a career center appointment,  $p=.029$ . Participants' SM was not significantly correlated with their desire for peer feedback,  $p=.882$ , their desire for career center feedback,  $p=.106$ , or their desire for a career center appointment,  $p=.856$ .

Table 2.  
*Spearman's correlations.*

	1	2	3
1. Stress Mindset (SM)			
2. Desire for peer feedback	-.024		
3. Desire for career center feedback	.235	.462**	
4. Desire for career center appointment	.029	.266	.338*

\*Correlation significant at the .01 level (2-tailed)

\*\*Correlation significant at the .001 level (2-tailed)

### Discussion

This study aimed to determine if stress-is-enhancing mindset training can manipulate students stress mindsets, and if those who have more stress-is-enhancing mindset are more likely to seek out feedback on potentially stressful experiences. As hypothesized, stress-is-enhancing mindset training had a significant effect on participants stress mindsets, as those who received the training had significantly more stress-is-enhancing mindsets than those who did not receive

the training. The mindset training had no effect on their level of perceived stress in their lives, but rather impacted their mindsets *about* this stress.

However, contrary to hypotheses, their mindset had no significant correlation with their willingness to be chosen to give a speech, their comfort being chosen to give a speech, or their perceived stress of the experience. Also contrary to hypotheses, their stress mindsets (which was successfully manipulated by training) had no significant effect on participants' desire for feedback, whether that be peer feedback, immediate career center feedback, or delayed career center feedback. While desire for career center feedback predicted desire for other types of feedback, none of this was significantly associated with participants' mindsets about stress.

The present study found that, while stress-is-enhancing mindset intervention training can effectively manipulate participants' mindsets about stress, this manipulation did not translate to participants' desire for feedback. This could be due to a lack of motivation for feedback amongst participants. The potential feedback was presented as an opportunity to practice their interviewing skills and receive personalized, professional feedback on this. However, participants were almost entirely in their first year of university, and thus interviewing for jobs may not be a pressing or important skill at this point in their university career. The potential stress of the feedback outweighs the benefits. This study should be repeated with a more balanced population, or with a feedback opportunity that is more imminent for participants.

### **General Discussion**

Both Study 1 and Study 2 demonstrated an impact of training – participants' stress mindsets were manipulated by an hour-long, stress-is-enhancing mindset intervention training. This indicates that a stress mindset intervention training does have a significant and lasting effect on participants' mindset about stress and can induce a more stress-is-enhancing mindset.

However, many previously demonstrated correlations were not found to be significant in these studies (eg. desire for feedback). Consistent with previous research, students' stress mindsets were malleable and were effected by training, but previously researched outcomes were not demonstrated.

In Study 1, the biggest weakness was a small sample size and high attrition rate. This makes the statistical power very weak, and this study should be repeated with a much larger sample size, as well as with more desirable incentives to encourage participant retention. In Study 2, the biggest problem was the skewed sample grade level, as the incentive for feedback (improved interviews) is far more imminent and desirable for older students than younger. Both Study 1 and Study 2 should be replicated with larger sample sizes and more evenly distributed grade levels.

These studies effectively established that stress mindset interventions significantly impact participants' mindsets about stress. Future research should continue to explore the implications of this change in mindset and what else will develop as a result. Future research should also explore the necessity for regular practice of this mindset and this effect post-training decay over time.

Stress mindsets are powerful, and a stress-is-enhancing mindset can be taught and learned through a simple, hour-long mindset intervention training program. Though these studies found few significant implications from these results (such as desire for feedback), various procedural and design errors may have been the cause of this. Previous literature indicates that stress mindset interventions have the capability for far-reaching and cascading effects in students' health, productivity, and performance, and we should continue to explore these connections to maximize benefits for students.

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