



## **Exploring Stress Mindset and Perceived Stress between College Student-Athletes and Non-Athletes**

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### ABSTRACT

*International Journal of Exercise Science* 15(5): 1554-1562, 2022. One's beliefs about the nature of stress (e.g., stress mindset) play a large role in the extent to which one experiences the detrimental or beneficial outcomes of stress. Stress mindset has been explored in college students, but there is limited research on stress mindsets in student-athletes. Sport can serve as a buffer to the negative impacts of stress for some student-athletes; however, pressures associated with sport participation increase stress in other student-athletes. Therefore, the purpose was to examine potential differences in stress mindset and perceived stress between non-athletes and college student-athletes. We hypothesized college student-athletes would report higher stress mindset scores but lower perceived stress scores. A total of 272 students ( $n = 87$  student-athletes;  $n = 185$  non-athletes) completed a demographic questionnaire, the Perceived Stress Scale, and the Stress Mindset Measure via an online survey. No significant differences were observed between student-athletes' and non-athletes' stress mindset scores; however, significant differences were observed between student-athletes' and non-athletes' perceived stress. Thus, student-athletes and non-athletes shared a similar view of stress, but student-athletes reported a lower level of perceived stress than non-athletes. While there appears to be no statistically significant differences in stress mindset between college non-athletes and student-athletes, both groups reported holding a stress-is-debilitating mindset. Implications for practitioners working with the college population are discussed.

KEY WORDS: Mindsets, appraisal, eustress, beliefs

### INTRODUCTION

Stress, a universal experience, is often viewed as negative and has been found to result in threats to one's health and a decline in wellbeing (8). However, researchers have demonstrated that stress can lead to positive outcomes as well, including an increase in health and performance in a variety of domains (6, 8, 9, 24). Research has found one's beliefs about the nature of stress (e.g.,

stress mindset) play a large role in the extent to which one experiences these beneficial outcomes of stress (9). Someone who believes the nature of stress is detrimental will likely experience more negative consequences, as compared to someone who believes stress can yield positive outcomes and views obstacles or stressors as merely a challenge, rather than a threat (6, 9).

The concept of stress resulting in positive outcomes is not a new idea. Selye (21) described stress as a biological response that was necessary for human survival. He also later differentiated between distress, a negative experience, and eustress, a positive experience. According to Selye (22), the stress response results in either positive or negative outcomes based on one's cognitive interpretation of the physical or physiological experience. Lazarus and Folkman (15) expanded on this idea of interpretation in the transactional theory of stress and coping in which stress is viewed as a complex interaction between a person and their environment over time in which how one appraises the situation and one's resources to cope with the situation largely determines the outcomes experiences. For example, appraising a stressor as a challenge as opposed to a threat, and determining that one has the resources to cope with the stressor can result in the experience of eustress.

While the concepts of eustress or distress and stress mindsets are distinct constructs, research has found they share some similarities. Research has provided evidence that stress mindset also impacts one's perception or appraisal of a stressor. For example, a stress-is-enhancing mindset has been found to be associated with challenge appraisals, which can result in eustress (13). Further, Park and colleagues (19) examined middle school students and found that for those students who held a stress-is-enhancing mindset, the negative relationship between negative life events and perceived distress was weakened.

With such impactful outcomes related to stress mindset, having a better understanding of the stress mindset in distinct populations is necessary. Given student-athletes have been found to be a distinct population from their non-athlete peers (11), research examining the stress mindset in athletes is needed. Furthermore, studies have found differences between student-athletes and non-athletes in stress levels and sources of stress (e.g., 27). For example, student-athletes face unique time demands, injuries, and performance pressures, among others (27). Sport has been found to serve as a buffer to the negative impacts of stress for some student-athletes; however, pressures associated with sport participation increase stress in other student-athletes (14). Thus, developing an understanding of stress mindset in a student-athlete population could be useful for enhancing performance and positively impacting other variables.

In addition to mindsets, there are a myriad of environmental or macro-level variables that impact stress in college students and student-athletes. Recently, increased stress levels have been reported in all college students since the beginning of the COVID-19 pandemic (1). The pandemic has increased challenges for college students related to success in the classroom with the change to virtual learning, financial insecurities, as well as fears for physical and mental health (17). For many student-athletes, the pandemic disrupted or abruptly terminated their

athletic season and goals, separated athletes from their teammates and coaches, and also created challenges for student-athletes to maintain their physical fitness and level of performance (17).

With these observed differences in stress levels and outcomes between non-athletes and student-athletes, developing a better understanding of the stress mindset and perceived stress between these distinct populations is warranted. Therefore, the purpose of this project was to examine any differences in stress mindset and perceived stress between college student-athletes and non-athletes. Given previous research has found stress mindset can impact how stressors are perceived (e.g., 19), we hypothesized that differences in stress mindset would be observed between non-athletes and current college student-athletes. We also hypothesized that differences would be observed between non-athletes and current college student-athletes in perceived stress.

## METHODS

### *Participants*

An *a priori* power analysis was performed using G\*Power 3.1 to determine the approximate sample size needed for the study. Given the small to medium effect sizes identified from previous studies on stress mindset (e.g., 9) it was determined a sample size of at least 106 participants should be obtained, with at least 53 participants in each of the two groups. A total of 340 individuals from the United States provided consent to participate in the study; however, 68 individuals did not complete the survey beyond the acknowledgement of consent or did not complete both dependent variables and were eliminated from data analyses. This left a total of 272 students ( $n = 87$  student-athletes;  $n = 185$  non-athletes) who participated in the study. Participants identified as male ( $n = 100$ ), female ( $n = 166$ ), and transgender ( $n = 1$ ), with five participants not providing their gender. Participants ranged in age from 18 to 35 ( $M = 21.08$ ,  $SD = 3.33$ ). Student-athletes represented NCAA DI ( $n = 13$ ), DII ( $n = 51$ ), DIII ( $n = 15$ ), NJCAA ( $n = 3$ ), and NAIA ( $n = 3$ ) schools. Student-athletes reported participating in volleyball ( $n = 30$ ), basketball ( $n = 17$ ), football ( $n = 8$ ), soccer ( $n = 8$ ), baseball ( $n = 5$ ), track and field ( $n = 4$ ), golf ( $n = 3$ ), softball ( $n = 3$ ), dance ( $n = 1$ ), lacrosse ( $n = 1$ ), swimming ( $n = 1$ ), and wrestling ( $n = 1$ ). Primary stressors that participants identified included COVID-19 concerns, school, work, and financial concerns. Further demographic information is included in Table 1.

### *Protocol*

This research was carried out fully in accordance to the ethical standards of the International Journal of Exercise Science (18). Following institutional human subjects committee approval, participants were recruited using convenience sampling by sharing the study information and corresponding hyperlink to the study, via social media posts, emails, and fliers posted around a southern U.S. university campus. Snowball sampling was also used by asking participants to share the study information with other individuals. Participants followed the hyperlink to access the study via Qualtrics, an online survey tool.

**Table 1.** Participant demographic frequencies by group.

		Group		
		Student-Athletes	Non-Athletes	Total
Gender	Male	35	65	100
	Female	46	120	166
	Transgender	1	0	1
	Did not report	5	0	5
Ethnicity	Black	14	10	24
	Asian	3	1	4
	Hispanic	24	106	130
	Native American	1	1	2
	Caucasian	40	58	98
	Bi/Multi racial	3	9	12
	Did not report	2	0	2

Participants provided demographic information and completed the Stress Mindset Measure and Perceived Stress Scale, along with two other measures of sport injury used in another study. Demographic information collected included age, gender, year in school, and major. Additionally, student-athletes also provided information pertaining to their athletic experience, such as type of sport.

The Stress Mindset Measure (SMM; 9) is an 8-item instrument which measures an individual's stress mindset. The SMM is completed using a five-point Likert-type scale with zero representing *strongly disagree* and four representing *strongly agree*. A sample item from the SMM is "Experiencing stress enhances my performance and productivity." Higher scores represent a stress-is-enhancing mindset, whereas lower scores represent a stress-is-debilitating mindset. The SMM has been found to have acceptable discriminant and criterion-validity (9). The Cronbach's *alpha* for the current study was 0.75. The three preliminary items from the SMM were also included in the current study; therefore, participants also reported the amount of stress they were experiencing, the primary source of stress in their lives, and how stressful they perceived that source of stress to be. The source of stress was an open-ended response, while the amount of stress and degree of stressfulness were both completed using a seven-point Likert-type scales from one (none or not stressful at all) to seven (an extreme amount of stress).

The Perceived Stress Scale (PSS; 4) is a 10-item instrument measuring the frequency of which one has had thoughts and feelings related to stress during the previous month. Participants complete the PSS using a six-point Likert-type scale from zero (never) to five (very often). A sample item from the PSS is "In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?" Four items on the PSS are positively worded and are then reverse-scored, so a higher total score on the PSS indicates a higher perceived level of stress. The 10-item PSS used here was found to have acceptable psychometric properties, especially in a college student population (16). The Cronbach's *alpha* for the PSS in this current study was 0.88.

### Statistical Analysis

Following Tabachnick and Fidell's (25) recommendations, data were first screened for normality, equality of variance, and outliers. Reliability analysis was performed on the Stress Mindset Measure and Perceived Stress Scale. Descriptive data (e.g., medians, means, standard deviations) were calculated for all variables using SPSS v. 26. A one-way MANOVA was conducted to assess differences in stress mindset and perceived stress between student-athletes and non-athletes. An alpha level of 0.05 was used for indication of statistical significance. Effect sizes are reported as partial eta squared, where .01 is small, .06 is medium, and .14 is a large effect size (3, 20).

## RESULTS

Data were first screened for normality, outliers, and patterns of missing data. Skewness and kurtosis values for the SMM and PSS scales revealed the data was normally distributed. A total of 340 individuals from the United States provided consent to participate in the study; however, 68 individuals did not complete the survey beyond the acknowledgement of consent or did not complete both dependent variables and were eliminated from data analyses, resulting in a total sample size of 272. No univariate or multivariate outliers were identified in the sample. Reliability analyses performed on both the SMM and PSS yielded an acceptable reliability for the SMM scale ( $\alpha = .75$ ) and good reliability for the PSS scale ( $\alpha = .88$ ).

A one-way MANOVA was calculated examining group (student-athlete or non-athlete) differences on perceived stress and stress mindset. A significant effect was found,  $\Lambda = .896$ ,  $F(2,269) = 15.683$ ,  $p < .001$ ,  $\eta_p^2 = .105$ . Separate follow-up univariate ANOVAs indicated a significant difference between groups on perceived stress,  $F(1,270) = 28.960$ ,  $p < .001$ ,  $\eta_p^2 = .097$ , but no difference between groups on stress mindset,  $F(1,270) = .792$ ,  $p = .374$ ,  $\eta_p^2 = .003$ . Specifically, non-athletes reported higher perceived stress levels ( $M = 2.47$ ,  $SD = 0.67$ ) than student-athletes ( $M = 2.06$ ,  $SD = 0.62$ ) in our sample. Further descriptive statistics are provided in Table 2.

**Table 2.** Means and standard deviations by group.

	Stress Mindset		Perceived Stress	
	<i>n</i>	Mean $\pm$ SD	<i>n</i>	Mean $\pm$ SD
Student-Athletes	87	1.65 $\pm$ 0.51	87	2.06 $\pm$ 0.62
Non-Athletes	185	1.57 $\pm$ 0.69	185	2.47 $\pm$ 0.67

## DISCUSSION

The first research question explored stress mindset between non-athletes and college student-athletes. No statistically significant differences in stress mindset were found between non-athletes and student-athletes. Previous research found that for some individuals, sports can be an outlet to alleviate stress; however, for others sport can be a stressor itself (14). For student-



athletes, research has found the accumulation of stressors from their roles as both students and athletes is often perceived as debilitating (26). Given that stress mindset reflects one's view of the process of stress itself and not simply an appraisal of any given stressor, it is possible that while college student-athletes and non-athletes may not differ in stress mindset, they may appraise their sources of stress differently. For example, the stress optimization model (7) was recently developed to highlight the importance of both stress mindset and stress appraisal in influencing individuals' use of coping strategies and resulting outcomes. Specifically, the stress optimization model posits that our valuation systems, or whether we believe stress and stress responses to be facilitative or debilitating to us, impacts our stress regulation goals and strategies (7). In this model, our valuation systems are comprised of both our beliefs about the nature of stress, or stress mindset, as well as how we appraise or reappraise stressors themselves (7). Therefore, college student-athletes and non-athletes may vary in their valuation systems due to differences in how they appraise or reappraise stressors.

Further, the concept of stress is multi-faceted and influenced by external factors as well as internal ones, such as mindset. The stress optimization model also recognizes that both the internal and external world can impact one's value system and perceptions or beliefs regarding stress (7). We did not investigate the impact of external variables on stress mindset or perceived stress in the current study; however, we recommend researchers integrate external variables in future studies exploring stress mindset in athletes. For example, understanding the role that organizational stressors, such as team culture, selection procedures, or the coach's interpersonal skills (2) play in influencing one's stress mindset or valuation of stress could be useful when designing stress mindset interventions.

The second research question examined differences in perceived stress between non-athletes and college student-athletes. Significant differences in perceived stress were observed between student-athletes and non-athletes. Specifically, non-athletes reported a higher level of perceived stress than student-athletes. The data for this study were collected during the COVID-19 pandemic and increased amounts of stress have been reported for college students since the onset of the pandemic (e.g., 1). However, sport has been found to serve as a buffer to the negative impacts of stress for some student-athletes (14), therefore it is possible sport and the social support networks the student-athletes have developed through sport provided them with coping mechanisms or an outlet for stress during the pandemic. For example, years before the COVID-19 pandemic, Cosh and Tully (5) interviewed Australian athletes between 18 and 33 years of age who reported receiving high levels of practical and emotional support from their parents and coaches. Further, these athletes described the support from parents and coaches as paramount in coping with stressors. Thus, sport and the social support networks developed through sport may have provided the student-athletes with sufficient support and coping skills above the non-athletes in this study.

*Limitations and Future Directions:* Limitations include the mode of data collection and the cross-sectional nature of the data. Given the data collected was via self-report, it is possible that participants responded inaccurately, perhaps due to social desirability (28). Due to COVID-19

social distancing protocols, data collection occurred via online surveys rather than in-person data collection, which may have also resulted in ineligible participants completing the survey. Finally, the data were cross-sectional, which, therefore, do not imply causation.

While no statistically significant difference was found between non-athletes and student-athletes' stress mindset, both groups reported having a stress-is-debilitating mindset on average. This supports the findings of previous researchers, who have found college students often report a stress-is-debilitating mindset (e.g., 12). Given the positive results previous stress mindset intervention researchers have found (e.g., 9), non-athletes and college student-athletes may benefit from such an intervention. Further, recent research has found cognitive reappraisals, alongside mindfulness and self-kindness, can create a buffering effect on pandemic-related burnout, in particular, emotional exhaustion (23). There have even been recent calls to consider utilizing stress mindset and reappraisal interventions to assist individuals in managing stress stemming from the pandemic (10). Twenty-three percent of the college student-athletes in the present study identified their sport as their primary source of stress, suggesting burnout could be contributing to their stress-is-debilitating mindset. Thus, future research should explore the relationship between stress mindset and burnout in a college population. Should a relationship exist, the next step would be examining the impact of a stress mindset intervention on college students to reduce burnout symptoms in student-athletes and also non-athletes who may be experiencing higher levels of burnout due to the pandemic.

*Conclusions:* The present research aimed to investigate if there were differences in perceived stress and stress mindset between non-athletes and student-athletes. College student-athletes were found to report lower perceived stress than non-athletes, suggesting that sport is serving as a buffer to the negative impacts of stress for the student-athletes in the present study. While there appears to be no differences in stress mindset between college non-athletes and student-athletes, both groups reported to hold a stress-is-debilitating mindset. From an applied perspective, the findings from this study can be useful for those working with both college non-athletes and student-athletes. Namely, with non-athletes and student-athletes reporting a stress-is-debilitating mindset, it may be beneficial for educators, coaches, or practitioners to help shift their stress mindset by helping them to understand how stress can produce positive outcomes and be beneficial for academic and athletic performance.

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