- **author's name**: Hui Peng John Yao
- **author's email address**: yaojohn12345678910@gmail.com
- **author's school affiliation**: TJHSST (Thomas Jefferson High School for Science and Technology)
- **author's school grade**: 11th
- **author's school address**:6560 Braddock Rd, Alexandria, VA 22312
- **advisor's name**: Dr. Carolyn Bufford Funk
- **advisor's email address**: cbuffordfunk@gmail.com

The Role of Game-Playing and Coping Styles in Mitigating Stress Among Students

Hui Peng John Yao

Dr. Carolyn Bufford Funk

June 1, 2024

Abstract

Students often experience high levels of stress (Pascoe et al., 2020). This increased stress can lead to mental health disorders such as depression and anxiety (Pascoe et al., 2020). Several studies have shown the potential for various games such as card games, video games, and RPGs (role-playing games) to reduce stress (Pallavicini et al., 2021; Baker et al., 2023). However, many of these studies had low sample sizes. Thus, we surveyed 139 college students to measure their stress levels, coping styles, and game-playing habits in order to see how games could reduce stress in an academic setting. Stress was evaluated using the PSS scale, coping styles were measured using the Brief-COPE, and game-playing habits were measured using nine time-based questions that we developed. We found that while variations in a participant's game-playing habits had little to no relationship with their stress level, differences in the use of coping styles could explain some of the differences in academic stress between participants. This information suggests that either these coping mechanisms are causing stress, stressed students prefer these coping mechanisms, or a third variable exists that increases both. This study contributes to the existing literature by providing a comprehensive analysis of different game types' relationship to stress in an academic setting.

The Role of Game-Playing and Coping Styles in Mitigating Stress Among Students

College students often experience elevated levels of stress: A 2015 American College Health Association-National College Health Assessment survey found that three in four college students reported stress, while one in five reported stress-related suicidal ideation (American Psychological Association, 2020). This stress predicts mental illnesses later in life, such as depression, anxiety, and substance abuse, and comes from many factors, such as academics, health, finances, and relationships with family, friends, and partners (Barbayannis et al., 2022).

Academic stress can be defined as stress resulting from a perceived requirement for academic achievement that leads to stress symptoms (Barbayannis et al., 2022). Students suffering from academic stress experience a reported lower quality of life as well as mental health issues such as anxiety and depression (Pascoe et al., 2020). As stress is an impairment to good sleep, many students consistently get insufficient sleep (Pascoe et al., 2020), recognized as a serious risk by the American Medical Association and the American Academy of Sleep Medicine (Pascoe et al., 2020). Academic stress can also lead to increased rates of substance abuse (Pascoe et al., 2020). Academic stress also leads to burnout and decreased self-esteem (Pascoe et al., 2020), causing some students to be unable to participate fully in education or drop out of school entirely (Pascoe et al., 2020).

Games of all kinds show promising stress-reducing abilities (Pallavicini et al., 2021;Baker et al., 2023). Video games have been shown to reduce stress and anxiety, and due to their affordability and convenience, provide an excellent way to reduce stress (Pallavicini et al., 2021). Dungeons and Dragons (D&D), a tabletop role-playing game, could potentially have psychological benefits such as increased empathy and self-reflection, but more research on its impacts is needed (Baker et al., 2023). Card games could provide stress reduction using the same methods as video games, but research is extremely limited on this topic if it exists at all. Our research was conducted on Google Scholar with search terms such as “Games and

Stress". There were few relevant papers with limited research looking at the impact of different types of games on stress and none on the effects of games on students' stress.

We conducted a study in which we analyzed the types and frequencies of games played and coping strategies used by a sample of students and their relationships with stress. In general, we expected that students playing social games, such as in-person card and board games or multiplayer games with their friends would experience reduced stress rates relative to those who did not play social games and those who played single-player games because social interaction decreases perceived stress (Clark, 1993). We hypothesized that there would be a difference in the stress-reducing effects of different games based on two factors. The two factors were whether the game was physical or digital, and to what extent the game involved socialization. We were unsure whether the physical or digital nature of a game had any effect on its stress reduction abilities, as little research has directly compared the two. Previous studies have shown that social interactions can have a positive impact on stress (Clark, 1993), so we hypothesized that games that involved more social interaction would decrease perceived stress.

Methods

Participants

The sample for this study was collected from the United States population of full-time undergraduate students at a college or university in a 42-question survey (see Appendix A). All participants were volunteers and recruited online using Centinment (Centiment, 2024) and received ~$3.50 after they completed the survey. The final sample for the analysis included 139 participants with 69 females, 67 males, and 3 identifying as non-binary. The mean age was 20.86 years (SD = 2.02), and the mean education level in college years was 2.70 (SD = 1.33). We obtained informed consent from all participants before completing the questionnaires. All data was collected anonymously. One participant's data was excluded from the analysis because they did not complete the survey in a single session, while all other participants did.

Materials and Procedure

Participants completed an online questionnaire through the survey tool Centiment (Centiment, 2024). Participants responded to questions about their game-playing habits, perceived stress, coping behaviors, and demographic variables. Demographic variables included gender, age, ethnicity, and grade level (see Appendix A). The survey was 42 questions long and took participants roughly 4.5 minutes to fill out (*mean* = 265.40s, *SD* = 240.11s).

We wanted to know how the social and in-person/online aspects of games affected participants' stress. We created a new, face-valid measure of gameplay habits with seven questions (see Appendix A) about how much participants played different types of games in the past month. Participants responded with an hour range of how long they played. These ranges covered 0 hours per week to 30 hours per week in 4-hour blocks. We chose a month as the timeframe for participants to recall, to accommodate participants who might have a "game night" once a month, to avoid recall bias in a longer timeframe, and to align with the timeframe for the PSS (Perceived Stress Scale) that we also used in our survey (Cohen et al., 2006).

To evaluate differences in playing games alone, with friends, with strangers, in-person, and online, we chose six types of games to evaluate: role-playing games (RPGs), massively multiplayer online games (MMOs), physical card/board games, single-player games, multiplayer games with friends, and multiplayer games with strangers. Examples were also given of popular games that would fall into our categories. For example, one question we asked was "During the last month, how many hours per week (on average) have you spent playing role-playing games? (Examples: Dungeons and Dragons)" (Appendix A). We chose these categories to evaluate differences in playing games alone, with friends, with strangers, in-person, and online.

We directly measured stress with the 10-item version of the Perceived Stress Scale (Cohen et al., 2006). Each question asks about a stressful feeling in the past month. For example: "In the last month, how often have you been angered because of things that happened that were outside of your control?" Participants responded on a five-point Likert scale, from 0 ("never") to

4 (“very often”). The PSS is the most widely used tool for measuring perceived stress, and is commonly used in stress studies and stress management programs (Andreou et al., 2011).

Coping strategies were assessed through selected subscales of the Brief-COPE (Monzani et al., 2015; Carver, 1997). Coping strategies were assessed to find what kind of coping strategies game playing encouraged. The Brief-COPE questionnaire assesses coping strategies with two questions per subscale. Each question asks about how much the participant engaged in a particular behavior on a scale from 1 (“I’ve not been doing this at all”) to 4 (“I’ve been doing this a lot”). The coping strategies we chose to evaluate were the following: self-distraction, use of emotional support, use of instrumental support, behavioral disengagement, venting, humor, and acceptance. We reasoned that playing games could be a form of self-distraction and provide a sense of comfort to encourage acceptance. We also reasoned that the use of emotional support, instrumental support, venting, and humor could rise from the social aspects of games. We excluded some subscales to shorten our survey and encourage more participation. We excluded the denial, substance use, positive reframing, planning, religion, and self-blame coping strategies, as we reasoned that an increase in gaming would not appreciably lead to any of these behaviors. The Brief-COPE questionnaire is commonly used in coping research (Rodrigues et al., 2022).

Results

Measures from Prior Research

Stress was measured through the Perceived Stress Scale (PSS) (Cohen & Williamson, 1988). The mean PSS score was 21.59 with a standard deviation of 6.25. The Perceived Stress Scale places participants into one of three categories, and we had 15 low-stress, 97 medium-stress, and 27 high-stress participants (out of 139) (Cohen & Williamson, 1988).

The Brief COPE subscales were used to find what kinds of coping mechanisms participants used. We used a one-way ANOVA to measure if coping was different across different subscales, and compared subscales on their 95% confidence intervals. There was a

main effect of subscales for the Brief COPE subscales we looked at, $F(6,828) = 29.32$, $p < .001$. Participants coped with stress through behavioral disengagement, 95% *CI*: (3.63-4.21), significantly less often than through any other coping strategy. The confidence intervals for self-distraction, 95% *CI:* (5.45-5.93), and acceptance, 95% *CI:* (5.74-6.20), overlapped, but they both were higher than for the other subscales, except for the humor scale, 95% *CI:* (4.98-5.66). Participants used self-distraction and acceptance coping strategies most often, followed by humor, then emotional support, 95% *CI:* (4.40-5.00), instrumental support, 95% *CI:* (4.46-5.02), and venting, 95% *CI:* (4.44-4.96), and finally behavioral disengagement, 95% *CI:* (3.64-4.20).

Table 1: Frequency of gameplay by Game Type, Game Group, and Hour Range

	Game Type			Game Group			
Hours Played	**RPG**	**Card/Board**	**Video Games**	**Singleplayer**	**Friends**	**Strangers**	**MMOs**
Not at all	54	38	17	22	25	45	69
0-4 hours	38	74	41	55	50	42	37
5-9 hours	25	14	27	27	29	26	11
10-14 hours	13	9	14	16	13	11	12
15-19 hours	2	1	9	3	10	1	5
20-24 hours	1	1	11	7	4	3	1
25-29 hours	3	1	7	3	2	5	1
Over 30 hours	3	1	13	6	6	6	3

Game-Playing Habits Measure

Our game-playing habit portion of our survey first asked participants about how often they played three Game Types: RPGs (role-playing games), card and board games, and video games. They were also asked about how often they played games that were singleplayer, multiplayer with friends, multiplayer with strangers, and massively multiplayer online (MMO) - their Game Group (see Table 1). Participants were asked how often they played each type of game per week and how often they played with each game group during the last month. The Game Type that participants reported playing the most was video games, with 40 participants

reporting to play them for 15 or more hours, far more than other game types. The Game Group participants were most likely to not play with at all was MMOs (69).

To see if there were differences in reported hours played amongst levels of Game Type, we ran a one-way ANOVA and found a significant main effect of Game Type, $F(2,276) = 45.2$, $p < .001$. We ran pairwise comparisons to explain the main effect. The main effect was mostly explained by significantly fewer hours of gameplay for card and board games (*mean* = 3.25, *SD* = 4.83) than video games (*mean* = 10.16, *SD* = 10.02), $t(138) = 9.45$, $p < .001$, and for RPGs (*mean* = 4.56, *SD* = 6.76) than for video games, $t(138) = -7.35$, $p < .001$. There was also a difference between card and board games and RPGs, $t(138) = 2.62$, $p = .01$.

To see if there were differences in reported hours played amongst levels of Game Group, we ran a one-way ANOVA and found a significant main effect of Game Group, $F(2,276) = 8.840$, $p < .001$. We ran pairwise comparisons to explain the main effect. The main effect was mostly explained by the differences between singleplayer (*mean* = 6.89, *SD* = 8.12) and MMO groups (*mean* = 3.73, *SD* = 6.50), $t(138) = 4.95$, $p < .001$ and the differences between friends (*mean* = 6.84, *SD* = 7.93) and MMO groups $t(138) = 4.95$, $p < .001$. There was also a difference between stranger (*mean* = 5.73, *SD* = 8.19) and MMO groups $t(138) = 3.16$, $p = .002$. There were also marginal differences between singleplayer and stranger groups $t(138) = 1.67$, $p = .097$, friend and stranger groups $t(138) = 1.63$, $p = .105$, and singleplayer and friend groups $t(138) = 0.06$, $p = .949$. The most common game group was singleplayer with a 6.89-hour average, followed closely by friends with a 6.842-hour average. Less common groups were strangers with a 5.727-hour average and MMOs with a 3.734-hour average.

Game-Playing Habits - Computed Variables

We compiled participants' tendencies of game playing. To do this, we took the Game Type that participants reported playing the most and set that as their Game Type Tendency. If multiple games were the participants' most played game, we called their tendency "Balanced". If they reported not playing a certain Game Type, then we called their tendency "Not at all". Out of

137 participants, 15 tended to play RPGs, 8 tended to play card and board games, 63 tended to play video games, and 53 were Balanced. We used the same approach to calculate participants' Game Group Tendency. For Game Group Tendency, 29 tended to play singleplayer games, 28 played multiplayer games with friends, 13 played multiplayer games with strangers, 9 played MMOs, and 60 were Balanced. 8 participants report not playing any games at all (See Table 2).

Table 2: Game Type and Game Group Tendency Frequencies

		Game Group Tendency				
		Balanced	**Friends**	**MMOs**	**Singleplayer**	**Strangers**
Game Type Tendency	**Balanced**	32	3	5	7	6
	Card/Board	3	3	0	1	1
	RPG	8	1	1	4	1
	Video Games	17	21	3	17	5

To find out how much Game Type Tendency and Game Group Tendency influenced each other, we ran a crosstab and a chi-squared test of independence. The relation was found to be significant. X^2 (12) = 26.60, p = 0.009. This means that the Game Type and Game Group tendencies were not independent of each other. It was common for participants to be Balanced in Game Group and Game Type, which had a frequency of 32. Other common combinations were video games with friends (21), video games and balanced Game Group Tendency (17), and video games and single-player (17). All other combinations occurred less than nine times.

We computed approximate game time by taking the sum of the hours participants reported for every Game Type and averaging it with the sum of the hours participants reported for every Game Group. Since participants answered in time ranges, we took the average of the times, so "0-4 hours" became 2 hours. The game times of the participants ranged from 0 to 62.5

hours, with 0 being the most frequent at 7 times, and 4 hours next at 6 times (see Figure 1). The data followed a skewed distribution - more participants with low times and few with high times.

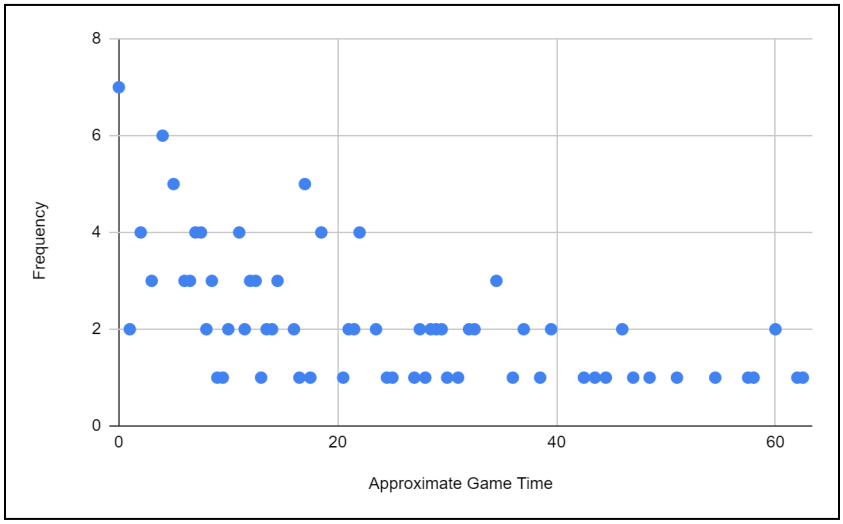

Figure 1: Frequency vs. Approximate Game Time

Relationships Between Measures - Correlations

To find out how time playing games and coping mechanisms affected stress, we correlated PSS score, Brief COPE subscales, and approximate time. We found that several subscales were significantly correlated. Emotional support and instrumental support showed a moderate correlation, $r = .6436$, $t(137) = 9.66$, $p < .001$. Venting and behavioral disengagement were weakly correlated, $r = .350$, $t(137) = 4.38$, $p < .001$, as were venting and humor, $r=0.304$, $t(137) = 3.73$, $p < .001$, instrumental support and acceptance, $r = .303$, $t(137) = 3.72$, $p < .001$, and behavioral disengagement and self-distraction, $r = .295$, $t(137) = 3.62$, $p < .001$. Venting and self-distraction showed a very weak correlation, $r = .217$, $t(137) = 2.61$, $p = .01$.

Several Brief-COPE subscales also correlated with the total PSS score. This included a weak correlation with self distraction, $r = .420$, $t(137) = 5.42$, $p < .001$, venting, $r = .380$, $t(137) = 4.81$, $p < .001$, and behavioral disengagement, $r = .392$, $t(137) = 4.98$, $p < .001$. There was also a weak correlation with humor, $r = .273$, $t(137) = 3.32$, $p < .001$. We observed the highest

correlation coefficient between a Brief-COPE subscale and approximate gameplay time with self-distraction, which were weakly correlated $r = .420$, $t(137) = 5.42$, $p < .001$.

It is also noteworthy that there was essentially no correlation between approximate total gameplay time and total PSS score, $r = -.0670$, $t(137) = -.787$, $p = .433$. This was contrary to our hypotheses, as we expected game-playing to affect stress levels.

Relationships Between Measures - Regressions

To see if any of our computed game-related variables predicted stress, we ran a linear regression comparing the effects of approximate game time, Game Group Tendency, and Game Type Tendency on the participants' PSS scores. We found that for every variable, the *p*-value was insignificant, with the smallest being time spent playing MMOs, $p = .124$, very little of the variation in PSS scores was explained, $R^2 = 0.05$, and the model itself was not significant, $p = .60$. Thus, game-playing habits as measured by our Game Type Tendency and Game Group Tendency variables did not influence participants' stress levels. This does not support our hypothesis that different kinds of games would decrease stress.

Next, to find the coping mechanisms that best predicted PSS score, we manually conducted a stepwise regression, adding in the subscale with the next highest correlation to PSS, and checking for interactions between variables in the model. We added subscales to our regression, running an ANOVA between the new and previous models to test for significant improvement in the variation explained. We did this until we added a subscale that was not significantly correlated and did not explain significantly more variance, removing it and stopping.

This left self-distraction, behavioral disengagement, and venting as predictors of PSS in the best-fit model, including the interaction of self-distraction and behavioral disengagement. The adjusted R-squared value for this regression was 0.31, so the three coping measures explained about 31% of the variation in PSS scores. This linear regression had *p*-values below .05 for all variables, with the largest being a *p*-value of .007 for behavioral disengagement, followed by .0004 for self-distraction and .0003 for venting with coefficients of 6.33, 5.66, and

1.93 for behavioral disengagement, self-distraction, and venting, respectively. This means that compared to game-playing variables and other Brief-COPE subscales, these subscales best explained differences in participants' stress.

Discussion

We set out to discover whether college students' game-playing habits could predict their coping styles and stress levels, as measured by the Brief-COPE and PSS, respectively. We developed a face-valid survey measure to gauge game-playing habits in different ranges of hours per week to assess the types of games participants played and with whom they played.

We gave a 42-question survey to 139 college students through an online survey tool, Centiment (Centiment, 2024). We found differences in gameplay by Game Type, Game Group, and different tendencies in most played game type and group played with most often. We were able to measure significant variation in gaming behavior. This variation in approximate total gameplay time, the types of games played, and the social interaction while playing games explained little of the variability in participants' PSS scores. Game-playing habits did correlate with the coping style of behavioral disengagement, but they did not correlate with other coping styles or with PSS scores. Unfortunately, the data did not support our hypotheses that a higher level of social interaction in video games would predict lower PSS scores in college students.

Game-playing habits showed a significant, moderate correlation with the coping style of behavioral disengagement, which could suggest that participants used games to disengage from the world or perceived games as a way to disengage. Game-playing habits did not correlate significantly with other coping styles or PSS scores.

COPE subscales (coping strategies) can help to explain the differences in PSS scores, unlike game-playing habits. Our data suggest that greater use of self-distraction, behavioral disengagement, and to a lesser extent venting predicted an increase in stress levels. This information could suggest that those suffering from stress could benefit from reducing their use of these coping mechanisms. It is also possible that people that are more stressed use these

coping strategies more often to deal with their stress. Finally, it may be that a third variable causes both an increase in stress and an increase in the use of these coping mechanisms. We did not find any coping mechanisms that correlated negatively with PSS scores.

Limitations and Suggestions for Future Research

Our study was a survey given out to college students, who participated for a small monetary reward. Due to the observational nature of the study and our desire to keep the survey short, we were unable to control for all confounding variables. We would have liked to control the amount and difficulty of classes/schoolwork, and for extracurriculars. These variables all add a lot of work to a student's life, increasing stress. Additionally, all participant data was self-reported, which could have created recall bias in the data.

An alternative method could be to instruct participants to play a certain game type over a period of time and then analyze their stress levels to avoid recall bias. For example, students could split into groups and be instructed to only play a certain game type for two weeks. This would remove recall bias and allow for stricter control of confounding variables. Our sample size of 139 participants allowed for significant results, so future studies could use a similar number.

Further research could be conducted on the more correlated coping mechanisms that significantly predicted PSS scores. Research on those coping styles, and behaviors associated with them, could help college students avoid damaging habits. For example, a study looking into the effects of coping mechanisms on students' mental health may show further correlations between coping mechanisms and mental health, suggesting which coping styles should be avoided or pursued to increase mental health. Research exists on Chinese student populations, but studying other populations could also give useful results (Wang et al., 2018).

Our research only found correlations between certain coping mechanisms and stress, but perhaps coping mechanisms we did not test would correlate with stress. We excluded some coping variables because we reasoned that they would not correlate with game playing (i.e. religion), but they have the same potential to correlate with stress as the included mechanisms.

Comparing college students to working adults could add even more insight, as the academic stress students experience is different from the work and family-raising stress adults experience.

Additional research on our hypothesis could be conducted on different populations. Perhaps older or younger students would respond better to games as a source of stress relief because they are not exposed to the same level of constant academic stress as college students, or they are exposed to a different kind of academic stress. Studying a clinical population could allow researchers to determine if games can prevent or decrease symptoms of mental health disorders. In a study on the impact of different game types on this population, we recommend measuring burnout and anxiety alongside stress and coping because prior research has shown that games can affect these variables (Pallavicini et al., 2021; Baker et al., 2023).

Conclusion

We set out to see how games could affect stress in college students and found no correlation between their game-playing habits and their stress levels. Game-playing habits did not explain the differences in stress between students, which did not support our hypothesis.

While our hypothesis was not supported, we did find that some Brief-COPE subscales such as self-distraction correlated positively with PSS scores. This information could guide further research on the effects of coping styles on stress.

Although prior research on the effectiveness of games in reducing stress exists (Pallavicini et al., 2021), this study contributes to the existing literature by providing a comprehensive analysis of different game types' relationship to stress in an academic setting.

References

American Psychological Association (2020). *Stress in AmericaTM2020: A National Mental Health Crisis*. Washington, DC: American Psychological Association.

Andreou, E., Alexopoulos, E. C., Lionis, C., Varvogli, L., Gnardellis, C., Chrousos, G. P., & Darviri, C. (2011). Perceived Stress Scale: reliability and validity study in Greece. *International Journal of Environmental Research and Public Health*, *8*(8), 3287–3298. doi:10.3390/ijerph8083287

Baker, I.S., Turner, I.J., & Kotera, Y. (2023). Role-play Games (RPGs) for Mental Health (Why Not?): Roll for Initiative. *Int J Ment Health Addiction 21*, 3901–3909 https://doi.org/10.1007/s11469-022-00832-y

Barbayannis, G., Bandari, M., Zheng, X., Baquerizo, H., Pecor, K.W., & Ming, X. (2022). Academic Stress and Mental Well-Being in College Students: Correlations, Affected Groups, and COVID-19. *Frontiers in Psychology, 13,* https://doi.org/10.3389/fpsyg.2022.886344

Carver, C.S. (1997). You want to measure coping but your protocol's too long: Consider the brief COPE. *Int. J. Behav. Med.*, *4*, 92–100.

Centiment | Better respondents, better data. (n.d.-a). Retrieved May 23, 2024, from https://www.centiment.co

Clark, L. F. (1993). Stress and the Cognitive-Conversational benefits of social interaction. *Journal of Social and Clinical Psychology*, *12*(1), 25–55. https://doi.org/10.1521/jscp.1993.12.1.25

Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), *The social psychology of health: Claremont Symposium on applied social psychology*. Newbury Park, CA: Sage.

Cohen, S., Kamarck, T., & Mermelstein, R. (2006). A global measure of perceived stress. *J. Health Soc. Behav.*, *24*, 385.

Karyotaki, E., Cuijpers, P., Albor, Y., Alonso, J., AuerbachRandy, R.P., Bantjes, J., Bruffaerts, R., Ebert, D.D., Hasking, P., Kiekens, G., Lee, S., McLafferty, M., Mak, A., Mortier, P., Sampson, N.A., Stein, D.J., Vilagut,G., & Kessler, R.C. (2020). Sources of Stress and Their Associations With Mental Disorders Among College Students: Results of the World Health Organization World Mental Health Surveys International College Student Initiative. *Frontiers in Psychology, 11,* https://doi.org/10.3389/fpsyg.2020.01759

Monzani, D., Steca, P., Greco, A., D'Addario, M., Cappelletti, E., & Pancani, L. (2015). The situational version of the brief COPE: Dimensionality and relationships with goal-related variables. *Eur. J. Psychol., 11*, 295–310.

Pallavicini, F., Pepe, A., & Mantovani, F. (2021). Commercial Off-The-Shelf Video Games for Reducing Stress and Anxiety: Systematic Review. *JMIR Mental Health, 8(8):e28150*

Pascoe, M.C., Hetrick, S.E., & Parker, A.G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth, 25:1*, 104-112, DOI: 10.1080/02673843.2019.1596823

Rodrigues, F., Figueiredo, N., Rodrigues, J., Ferreira, R., Hernández-Mendo, A., & Monteiro, D. (2022). A Comprehensive Review and Bifactor Modeling Analysis of the Brief COPE. *Inquiry : a journal of medical care organization, provision and financing*, *59*, 469580221108127. https://doi.org/10.1177/00469580221108127

Wang, P., Xiong, Z., & Yang, H. (2018). Relationship of Mental Health, Social Support, and Coping Styles among Graduate Students: Evidence from Chinese Universities. *Iranian journal of public health*, *47*(5), 689–697.

Appendix A

Table 3: Effect of Games On Coping And Stress Survey completed by participants.

Questions	Type	Response Options
Game Playing Habits survey measure		
During the last month, how many hours per week (on average) have you spent playing role-playing games? (Examples: Dungeons and Dragons)	single select	• Not at all • 0-4 hours • 5-9 hours • 10-14 hours • 15-19 hours • 20-24 hours • 25-29 hours • 30 or more hours
During the last month, how many hours per week (on average) have you spent playing card games and board games? (Examples: Monopoly, Uno, Poker - not including online or digital versions of these games)		
During the last month, how many hours per week (on average) have you spent playing video games? (Examples: Candy Crush, Fortnite, World of Warcraft)		
During the last month, how many hours per week (on average) have you spent playing single-player games? (Examples: Candy Crush, Dark Souls, Mario Games)		
During the last month, how many hours per week (on average) have you spent playing multiplayer games with friends (with one friend, and/or a group that is all or majority friends)? (Examples: Monopoly, Uno, Fortnite, Dungeons and Dragons)		
During the last month, how many hours per week (on average) have you spent playing multiplayer games with strangers (with one stranger, or with a group that is all or majority strangers)? (Examples: online shooter game with party autofill, showing up to a public game night or school club)		
During the last month, how many hours per week (on average) have you spent playing massively multiplayer online games (MMOs)? (Example: World of Warcraft)		
Perceived Stress Scale (PSS) (Cohen et al., 2006) - example statements shown		

In the last month, how often have you been upset because of something that happened unexpectedly? In the last month, how often have you felt that you were unable to control the important things in your life?	single select	• Never • Almost never • Sometimes • Fairly often • Very often
Selected subscales from the Brief COPE (Monzani et al., 2015; Carver, 1997) - example statements shown		
I've been turning to work or other activities to take my mind off things. I've been getting emotional support from others.	single select	• I haven't been doing this at all • I've been doing this a little bit • I've been doing this a medium amount • I've been doing this a lot
Demographics		
Age	number	
Current School Year	single select	• 1st • 2nd • 3rd • 4th • 5th or above
Gender	single select	• Male • Female • Non-Binary • Agender • Prefer not to state
Ethnicity	multi select	• White • Black • East Asian • South Asian • Southeast Asian • Latino • Middle Eastern • Native American or Native Hawaiian or other indigenous peoples • Pacific Islander • Multiracial • Prefer not to state