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Examining the Association Between COVID-19 and Anxiety in College Students With Varying Personality Traits

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EXAMINING THE ASSOCIATION BETWEEN COVID-19 AND ANXIETY IN COLLEGE STUDENTS WITH VARYING PERSONALITY TRAITS

by

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ABSTRACT

The goal of this thesis was to examine the relationship between personality types (i.e., extraversion and neuroticism) and anxiety levels among college students during the height of the pandemic. Specifically, this study examined whether factors contributed to anxiety and whether differences in anxiety scores differed by personality trait. It was hypothesized that individuals who scored high in both extraversion and neuroticism would report an increase in anxiety during the height of COVID-19 pandemic. Neuroticism is linked to emotional responses to a negative event (e.g., such as COVID), which may play a role on anxiety levels. The level of extraversion that an individual displays may predict social preferences, and in turn, their reaction to the situations that create isolation such as the pandemic. A cross-sectional study was conducted with 163 students at the University of Central Florida, who completed a survey that measured anxiety levels before and after the start of the pandemic in addition to personality types. Results showed that an individual's level of extraversion correlated with an increase in anxiety levels [$F(2,116) = 4.720$, $p = 0.011$, $np2=.075$], but level of neuroticism level [$F(2,117) = 0.878$, $p = 0.433$)] did not. These findings have implication for other isolation situations, in which a person's personality traits could help to predict how their mental health may be affected by a future pandemic or social isolation.

DEDICATION AND ACKNOWLEGEMENTS

This thesis is in dedication to my loving and supportive family, who has stood by me through it all. To my Mom and Dad – thank you for everything you have done to encourage me in pursuing my dreams. To my wonderful siblings – thank you for being there as my friends and confidantes, you always bring a smile to my face. Without you all, this thesis would not have been possible.

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INTRODUCTION

Coronavirus, or COVID-19, is an infectious disease caused by the SARS-CoV-2 virus. Those infected with the virus have experienced a wide range of symptoms, including fever or chills, shortness of breath, cough, headaches, and loss of taste or smell (Centers for Disease Control and Prevention [CDC], 2022). Some people exposed to COVID-19 experience mild to moderate respiratory illness, whereas others require medical attention, including hospitalization. Since the first confirmed case on January 20, 2020, the number of COVID-19 cases in the U.S. was estimated at about 97 million, resulting in 1.06 million deaths (CDC, 2022). To slow the spread of the virus, many states, including Florida, issued "stay-at-home" orders, which led to initial societal shutdowns followed by a switch to "virtual" interactions in the workplace, schools, and socially. For many individuals, the closing of businesses impacted the financial stability of households. Social distancing measures, restrictions on movement, mask and vaccine mandates, and government shutdowns, in combination with fears of illness and death, had compounding psychological and social effects on the U.S. population.

Numerous studies have examined the pandemic's impact on the psychological well-being of exposed groups, including children, healthcare workers, and college students. These populations have been found to develop post-traumatic stress disorder, anxiety, depression, and other mental health problems (Xiong et al., 2020). According to the Mayo Clinic (2021), the pandemic contributed to an increase in the number of U.S. adults who reported symptoms of stress, anxiety, depression, and insomnia. Furthermore, based on research conducted with over three million Americans, Blanchflower (2022) found major peaks in anxiety and depressive symptoms during the pandemic (i.e., in 2020). There continued to be a trend towards worsening mental health even after controlling for seasonality and state-fixed effects across states. It is also worth noting the

report showed increases in depression and anxiety among the U.S. population prior to COVID but rising rates of mental health problems were exacerbated due to the pandemic (Blanchflower, 2022). Additionally, there has been an increase in alcohol and drug use, being used to cope with mental health and fears about the pandemic. Based on data collected from the CDC (2022), there were close to 100,000 drug overdose deaths in the U.S. in the first year of the pandemic, showing an increase of nearly 30% from the year before.

The increasing rate of mental health problems has also impacted college students. Prior to COVID-19, The 2019 Annual Report of the Center for Collegiate Mental Health reported that anxiety continues to be the most common problem (62.7% of 82,685 respondents) among students who completed the Counseling Center Assessment of Psychological Symptoms (Son et al, 2020). Factors contributing to mental health problems in college students include both social and academic pressures. For example, students often struggle to fit in with their peers and they tend to have difficulties adjusting to being away from home. Academically, they also face pressures to succeed in addition to preparing for future careers. In fact, 82% of students report increased concerns about academic performance. Among the mental health challenges that college students seem to face, anxiety appears to be a common problem. The Mayo Clinic reported that since the start of the COVID-19 pandemic, 1 in 3 college students experienced mental health problems, with 44% reported experiencing anxiety symptoms (Druckenmiller, 2022).

Social restrictions may have contributed to the changes in anxiety rates among this population. Limited connection to peers and/or professors may have also impacted learning. For instance, in 2020, many universities switched to virtual options for classes, which allowed students to complete their studies from home. Due to this switch, universities and colleges started to use new teaching platforms or applications such as Zoom and Google to better integrate students'

virtual learning. For both students and faculty, this new learning environment may have created undue stress. Studies have found that faculty faced many unforeseen challenges, including lack of online-teaching experience, which may have contributed to stress and anxiety in students who encountered difficulty learning online (Mosleh et al., 2022). Furthermore, students expressed difficulties in concentrating and maintaining the necessary motivation for distance learning. A lack of motivation for learning virtually has also been cited as a problem contributing to learning (Khobragade et al., 2021).

In addition to changes to the academic environment, the pandemic also influenced social dynamics and relationships. In one study, college students felt as if they had low-to-moderate social support during the pandemic (Changwon et al., 2020). To try to connect and socialize, some students turned to greater use of social media, such as Snapchat, Instagram, and Twitter. As such, this increased dependence of social media to stay 'connected' could have contributed to smartphone and internet addiction (Zhao & Zhou, 2021) and other unhealthy habits (e.g., sleep issues). Conversely, other students may have felt even more isolated because they could not connect with and spend time with friends within settings most comfortable to them. These experiences may have been challenging for students who possess different types of personalities.

Personality Traits

The general population exhibits a variety of personality types, as has been studied by behavioral psychologists. According to the trait paradigm, personality can be described as the entirety of all characteristics reflecting "relatively stable patterns of feeling, thinking, striving, and behaving and by which a person is more or less distinguished from others" (Kandler & Riemann, 2015, p. 51). Personality traits are thought to be the core components that shape how individuals respond to the vast array of stimuli they encounter in the world. Personality has been measured

using the Five-Factor model, which characterizes personality across five domains: an individual's level of extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (McCrae et al., 2008). Studies have found that college students' personality types can be indicative of how they react to stressors during college. Two specific personality traits of interest in this study include extraversion and neuroticism.

Extraversion Personality Trait

Extraversion, which is also referred to as surgency, "is indicated by assertive, energetic, and gregarious behaviors" (Grice, 2019, p.1). From this definition, extraversion is an indication of how much stimulation and social interaction an individual prefers. For example, an individual who scores high in extraversion on a personality test likes to participate in social gatherings, whereas an introvert, or someone who is low in extraversion, is less outgoing and more comfortable by themself. Introverts tend to be less involved in social activities and do not require external stimulation as extraverts. In the context of COVID-19, where social distancing requirements were enforced, individuals with high levels of extraversion have had more difficulty following social distancing measures or 'stay-home' recommendations due to their outgoing and sociable nature (Asselmann et al., 2020). Considering the positivity of extraverts, it may be unlikely that they experienced fear, anger, or other negative feelings during the pandemic (Agbaria & Mokh, 2021; Nikčević et al., 2021).

Neurotic Personality Trait

In defining neurotic personality traits, an individual who scores low in neuroticism is emotionally stable, whereas an individual who is high in neuroticism tends to experience more negative emotions. Neuroticism is "equivalent to emotional instability and can be seen in irritable and moody behaviors" (Grice, 2019, p1). These individuals tend to have an emotional response to

events that would not affect most people and have a higher chance of feeling threatened or internalizing negative thoughts and emotions. Individuals with this trait may find it difficult to think clearly and cope with stress. During the pandemic, and corresponding to stay-at-home orders, neurotic individuals may have reacted negatively due to their tendency towards hyper-concern and emotional vulnerability (Nikčević et al., 2021). It may be postulated that these people felt threatened during the height of the pandemic (Aschwanden et al., 2021). Additionally, neuroticism has been linked to many different forms of psychopathology, particularly depression and anxiety (Vittengl, 2017). As further evidence for this association, a meta-analysis by Kotov and colleagues (2010) showed that of the Big Five traits, neuroticism is the personality dimension that is most strongly connected to symptoms of anxiety and depression. Thus, considering the social stress and environmental changes associated with the pandemic, individuals (i.e., college students) with certain personality traits may have been impacted differently, specifically as it relates to mental health.

Current Research Study

While there has been a growing body of research examining the impact of COVID-19, many studies have only examined the relationship between social, economic, or health factors and mental health. To date, very few studies, if any, have examined how college students' personality types have played a role in their emotional reactions to the pandemic. Neuroticism is linked to emotional responses to a negative event (e.g., such as COVID), which may play a role in anxiety levels. The level of extraversion that an individual displays may predict social preferences, and in turn, their reaction to the pandemic. These findings could be applied to other isolation situations, in which a person's personality measures (namely, their levels of extraversion and neuroticism) could help to predict how their mental health may be affected by a pandemic or social isolation.

Therefore, this study aimed to examine the relationship between personality types (i.e., extraversion and neuroticism) and anxiety levels among college students before and during the height of the pandemic. Specifically, this study examined whether COVID-19 contributed to anxiety and whether differences in anxiety scores differed by personality trait. It was hypothesized that individuals who scored high in both extraversion and neuroticism would report an increase in anxiety during the COVID-19 pandemic.

METHODS

Sample

The population that was sampled included students at the University of Central Florida (UCF). The sample was recruited using a convenience sampling approach. Specifically, individuals were recruited via social media outlets such as Snapchat, Instagram, and GroupMe. Additionally, flyers were posted on campus and emails were sent to student organizations such as Knights PALS for Autism and KnightThon. Personal outreach was conducted via sharing flyers/emails with research labs and honors students. Additionally, two classes were visited to request study participation.

Research Design and Procedures

This retrospective cross-sectional study aimed to examine student's personality traits (i.e., extraversion and neuroticism) and anxiety levels before the pandemic and during the height of the pandemic (defined as in 2020 during emergency lockdowns, social distancing, mandared masks, required vaccinations). A quantitative, 68-item anonymous survey was distributed online through Qualtrics beginning on February 28, 2023, to March 25, 2023. During this timeframe, students who received flyers or emails were given brief details about the study and were asked to review additional study information by clicking on an online link. If participants agreed to take part in the study, they were automatically linked to the survey.

The use of an online survey is beneficial because it allows for quick distribution and allows participants to respond remotely at any time. The survey included demographics and pre-existing measures from the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988; Beck & Steer, 1993) and the Big Five Personality Questionnaire (BFI; John et al. 1991). The study was approved by the UCF Institutional Review Board on February 24, 2023.

Measures

Demographics

The survey included questions that asked about the students' age, gender identity (Male, Female, and Prefer not to answer), and year in school (Freshman, Sophomore, Junior, Senior, Graduate Student).

Anxiety

The Beck Anxiety Inventory (BAI) was developed by Beck et al. in 1988 to measure the frequency of an individual's experience with anxiety symptoms (Beck, Epstein, Brown & Steer, 1988). The scale consists of 21 items. Students were asked to indicate how often they experienced certain symptoms such as worry, nervousness, and the ability to relax. Responses were ranked on a Likert scale that ranged from 0 to 3, with a response of 0 meaning "Not at all" to 3 meaning "Severely". Participant's responses were summed to find a total score that ranged between 0 and 63. A total score of 0–7 is considered minimal anxiety, 8–15 mild anxiety, 16–25 moderate anxiety, and 26–63 severe anxiety.

Participants were asked to first respond to BAI questions regarding their experiences before the start of the COVID-19 pandemic, and then they were asked to reflect on the same symptoms during the height of the pandemic. In this sample, the internal consistency was high (Cronbach's alpha = .93), which is consistent with prior literature (Chapa, 2021). The questions from the BAI are included in Appendix A.

Personality Traits

The Big Five Personality Inventory is a 44-item questionnaire that measures dimensions of personality (Goldberg, 1993). The overall inventory has questions that focus on each of the following five personality dimensions: extraversion vs. introversion; agreeableness vs.

antagonism; conscientiousness vs. lack of direction; neuroticism vs. emotional stability; and openness vs. closedness to experience. For this study, two subscales were used. The extraversion subscale contains eight questions. Example items reflected whether participants see themselves as talkative or someone who generates a lot of enthusiasm. The subscale used for neuroticism also contained eight items. In this scale, participants were asked whether they see themselves as someone who is tense or remains calm in stressful situations. Responses were assessed on a 5-point Likert scale, with 1 meaning "disagree strongly" and 5 meaning "agree strongly". Scores for each subscale ranges from 8 to 40. A score between 10 and 24 indicates low extraversion/neuroticism, while a score between 25 and 35 indicates moderate exhibition of the traits. A score between 36 and 50 indicates a high level of extraversion/neuroticism, Scores for each of the two subscales were averaged separately. For both scales, a higher score indicated higher levels of extraversion and neuroticism. The reliability coefficients for all both scales were consistent with prior research (Cronbach's alpha = .88 [extraversion] and .83 [neuroticism]) (McCrae, 2011). Subscales of Big Five Personality Inventory are included in Appendix B.

Data Analysis

Descriptive statistics were used to identify the characteristics of the sample (mean age, frequency distribution of gender identity and year in school) and to gain insight on the key variables of interest in the study: extraversion, neuroticism, and anxiety scores (mean, standard deviation, and range).

New variables were created to capture two scores for anxiety: before the pandemic score (PreBAI) and during the height of pandemic score (PostBAI). The anxiety scores were computed by summing the participants' responses at baseline and during the pandemic. A new variable was computed to capture the change in scores from the two timepoints (ChangeBAI). New variables

were also created to capture total scores for neuroticism and extraversion. Some items were reverse scores before being summed. See scoring guidelines in Appendix B. Additional variables were created to separate groups into the following categories. For the neuroticism traits, the groups were as follows:

1. Low neuroticism: participants with a summed neuroticism score between 10 and 24
2. Moderate neuroticism: participants with a summed neuroticism score between 25 and 35
3. High neuroticism: participants with a summed neuroticism score between 36 and 50

For the extraversion traits, the groups were as follows:

4. Low extraversion: participants with a summed extraversion score between 10 and 24
5. Moderate extraversion: participants with a summed extraversion score between 25 and 35
6. High extraversion: participants with a summed extraversion score between 36 and 50

To answer the research questions, a paired-samples *t*-test was conducted to find if there was a significant difference between the sample's anxiety scores before and during the height of the pandemic. Assumptions of normality were conducted. A one-way ANOVA was then conducted between groups 1-3, comparing neuroticism level to the difference in anxiety experienced (ChangeBAI). Another one-way ANOVA was conducted between groups 4-6, comparing extraversion levels to the difference in anxiety experienced. This analysis helped to answer the research question and find whether there was a significant difference in the change in an individual's experienced anxiety based on the level of neuroticism and extraversion that they exhibit. When significant differences were observed, a post-hoc (Tukey) was performed. A value of $p<0.05$, with a confidence interval of 95% was used for all analyses. All analyses were performed using SPSS version 28.0.

RESULTS

The aim of this study was to analyze whether there was a difference in anxiety levels before and during the height of pandemic and whether such differences varied between the two different personality types, extraversion and neuroticism. The following results show descriptive findings of the sample and key variables, in addition to study outcomes.

Participant Demographics

A total of 163 participants consented to take part in the study. Descriptives of the sample showed that the ages of participants ranged from 18 to 27, with the mean age being 19.9 years (SD=1.64). Approximately 51% of the sample were 18 and 19 years old. Additionally, there were more females (67.5%) in the sample than there were males (31.9%). The majority of students self-identified as White or Caucasian (62.9%), Asian (19.7%), and Black or African American (6.7%). Close to 11% identified as Pacific Islander/Native Hawaiian, Native American/Alaska Native, or other. Most of the sample were freshman (38.1%). Other grade levels included sophomores (21.3%), juniors (15%), seniors (22.5%), and graduate students (3.1%).

Differences in Anxiety Symptoms

The mean anxiety score of the sample before the start of the pandemic was 32.88 (SD = 9.76), whereas the mean anxiety score during the height of the pandemic was 37.11 (SD =11.46), both scores classified as severe anxiety according to the Beck Anxiety Inventory scoring criteria. To examine differences in anxiety scores, a paired samples *t*-test showed a statistically significant difference between the timepoints, $t(120) = -5.782$, $p < .001$. The effect size was moderate, $d = .525$.

Personality Traits

The mean extraversion score was 23.23 (SD = 7.178). This average score fell within the low extraversion category. The breakdown of individuals in each of the category types (low, moderate, high) can be seen in Table 1A.

Table 1A: Individuals in Each Extraversion Subcategory

Category Type	Percentage (%)
Low Extraversion (10-24)	58.9%
Moderate Extraversion (25-35)	34.1%
High extraversion (36-50)	7.0%

N=129

The average neuroticism score was 26.22 (SD = 6.20). This average score fell into the moderate neuroticism category. The breakdown of individuals in each of the category types (low, moderate, high) is displayed in Table 1B.

Table 1B: Individuals in Each Neuroticism Subcategory

Category	Percentage (%)
Low Neuroticism (10-24)	35.7%
Moderate Neuroticism (25-35)	58.9%
High Neuroticism (36-50)	5.4%

N=129

Hypothesis Testing

A one-way between subjects ANOVA was conducted to compare the effect of neuroticism, the independent variable, on change in anxiety, for those who exhibited high, moderate, and low levels of neuroticism. The Welsch test showed that there was not a significant effect of neuroticism levels on the change in anxiety at the $p<.05$ level [$F(2,117) = 0.878$, $p = 0.433$)].

Additionally, a separate one-way between subjects ANOVA was conducted to compare the effect of extraversion on change in anxiety for those who exhibited high, moderate, and low levels of extraversion. The analysis showed that there was a statistically significant effect of extraversion levels on the change in anxiety at the p<.05 level [$F(2,116) = 4.720$, $p = 0.011$, $n_p^2 = .075$)]. Tukey post-hoc test results indicate that the mean score for the low extraversion group ($M = 2.36$, $SD = 7.19$) differed significantly from the moderate extraversion group ($M = 5.98$, $SD = 7.80$). Additionally, the mean score from the low extraversion group ($M = 2.36$, $SD = 7.19$) also differed significantly from the high extraversion group ($M = 9.13$, $SD = 10.96$) at the 0.05 level. There was no significant difference between the moderate and high groups.

DISCUSSION

The purpose of this study was to examine whether there were increases in anxiety in the college-aged population since the height of the COVID-19 pandemic, and whether heightened anxiety was related to neurotic and extraverted personality types. It was hypothesized that the population would exhibit an increase in anxiety levels, and individuals who scored high in extraversion (i.e., individuals who are talkative and enjoy spending time around others) would show a greater increase in anxiety symptoms than those who scored lower in extraversion. Similarly, it was hypothesized that individuals who scored higher in neuroticism (i.e., individuals who experience worry) would report a greater increase in anxious symptoms as compared to those who scored lower.

The results indicated that participants overall did experience a significant increase in anxiety symptoms during the height of the pandemic, as when compared to before the pandemic began. However, when breaking this group down by personality types, it was found that the increase in anxiety was not related to level of neuroticism. Conversely, the level of extraversion did seem to be related to changes in anxiety.

It is known that individuals who rank high in extraversion require more social interaction than those who display lower levels of extraversion (i.e., introverts). With the start of the pandemic came limitations to face-to-face interaction, which kept many extraverts from getting the social interaction they needed. Among participants in this sample who displayed moderate and high levels of extraversion, the data indicates that they experienced significantly higher levels of anxiety than those who were low in extraversion. It may be posited that introverts were used to being alone or isolated as this is part of their personality. For those with moderate and high levels of extraversion, being “isolated” or disconnected with others may have gravely impacted their mental

health. It may be assumed that social media could have been an outlet for these participants as studies have indicated “a heavy reliance on social media during the COVID-19 pandemic, with more than three-quarters of respondents (762/1003, 76%) reporting they relied on social media at least ‘a little’(Neely et al., 2021).Although it is unknown, this level of interaction may not have been sufficient for individuals who ranked moderate to high in extraversion. While technological outlets serve as an outlet to speak and spend time with peers, they are not a replacement for face-to-face interaction.

Alternatively, it is possible that in trying to seek out a connection with their peers in the face of lockdowns, individuals who ranked moderate to high in extraversion were more likely to turn to social media than those who were more introverted. It is possible that the overuse of social media may have also had a detrimental impact on mental health. To illustrate, in a 2018 study, researchers examined the impact of social media usage (SMU) on depression and anxiety symptoms, grouping individuals based on the frequency of their social media usage. They found that people with the highest level of SMU were classified as “wired”. The results showed that, “membership in the wired cluster was most strongly associated with elevated symptoms of both depression and anxiety", suggesting that “high volume SMU occurring in tandem with high levels of problematic use and high emotional connection to social media is most concerning” (Shensa et al., 2018, p.10). As extraverted participants were using social media as one of their only ways to stay connected to their peers, the emotional connection may have also poorly impacted their mental health. Follow-up studies involving social media usage should be conducted to gain more insight on this factor.

As the data shows, all participants had some increase in anxiety due to the pandemic, and it is possible that the level of neuroticism did not play a role in the increase of symptoms. To

elaborate, while it is true that individuals who are higher in neuroticism tend to worry more, the findings did not support the proposed hypothesis. In this study, it appears all students (low-to-high neurotics) had fears and worry about the pandemic. These fears may have been impacted by the presence of the media in sharing information about the pandemic and increasing worry in all participants, regardless of their levels of neuroticism. As noted above, social media usage increased dramatically over the course of the pandemic, which allowed for quick dissemination of information about the pandemic. However, this outlet also allowed individuals to share their own personal experiences, tragedies, and interpretation of the news, which may have led to exaggerated negative content. A study focusing on the impact of COVID-19-related social media use on mental health outcomes reported that the pandemic was operationalized as a significant stressor, and the "indispensability and complexity of social media [usage] might [have] amplif[ied] the negative psychological consequences of disaster exposure while at the same time covering the effects of traditional media." (Zhao & Zhou, 2020, p.1031). It is possible that for all students, the heightened use of social media increased their anxiety.

Since this study focused on college-aged students and was sampled from a university setting, it is also important to consider the role of anxiety regarding academics. It is very likely that all students, not just those who exhibit high neuroticism, experience a fear of failure, which may have been heightened due to changed learning methods, thus contributing to anxiety levels. The pandemic led to a switch to virtual learning and many other changes that both professors and students had to adapt to. As a result, students who had difficulty with this change may have experienced more academic anxiety than they would have otherwise. Overall, it is important to note that regardless of personality type, students exhibited high levels of anxiety before the start of the pandemic and during its height.

Study Limitations

There are several limitations to this study that must be considered. First, it is important to keep in mind that the data is derived from participants' self-report data. This may lead to skewed results because individuals may have felt inclined to give exaggerated responses. Due to the sensitive and personal questions asked in the research, participants may not have wanted to reveal details that they felt were embarrassing or too revealing. Additionally, each participant's response could be skewed by the mindset that they were in while responding to the survey. For example, if they were stressed about an exam or where taking the survey in a stressful environment, participants may have been inclined to rate their current anxiety symptoms higher than in normal situations. The best way to gauge for these skewed responses would be to collect the participants' responses over time. Perhaps, qualitative data collected via focus group or interview could have provided greater insight into reactions to the pandemic.

Additionally, this study collected retrospective data, in which participants were asked to think back to their experiences before the start of the pandemic. It is important to keep in mind that participants' responses may have been skewed due to not being able to accurately remember their overall anxiety. They may be responding based on significant events in which they felt strong anxiety, which would be more likely recalled. The only way to prevent this bias would have been to survey individuals who had already completed the BAI before the start of the pandemic.

This study also was limited in its scope because it utilized a small population of college students located in a large university in Orlando, Florida. Due to different lockdown measures and COVID-19 experiences across the country, students from other states may have exhibited different responses. For example, in states that had stricter lockdown policies and mask mandates, it is possible that other students may have responded differently. Furthermore, this study utilized a

convenience sample, and it is possible that the individuals who chose to participate were more likely to exhibit certain personality traits or may have had a history of anxiety.

There are also limitations that arise from the tools that were utilized in this study. To elaborate, the BAI was used due to limited items and easy to understand questions. However, it is best used to measure anxiety over a one-week period, and some questions may not be able to differentiate between anxiety and depression (Julian, 2011). In future studies, this may be mitigated by using a longer, more comprehensive test to measure anxiety. The Big Five Personality test was used for similar reasons and has proven to have high internal reliability. However, studies show that some traits, such as extraversion, are sometimes skewed by cultural effects that may not be controlled for by the questionnaire (Gurven et al., 2013). To elaborate, the personality ratings of students that come from more diverse backgrounds may not have been encompassing of their personalities, due to the nature of the survey.

Future Research

For future research, the generalizability of this study can be improved by considering a larger, more diverse population. Students from different states may have experienced the pandemic differently, and to account for this, the study could be expanded to consider students from all types of communities. To elaborate, a student from a rural community in West Virginia may have been impacted by the pandemic differently from a student living in a metropolitan area in New York.

Since the data and findings from this study relied on just a few questions that were intended to analyze the participants' experiences, these findings could be enriched by conducting interviews with participants. These interviews would allow researchers to not only find the students' anxiety levels, but also other factors contributing to anxiety, what factors made it increase, and ways to reduce symptoms. Additionally, longitudinal studies could be conducted to interpret individuals'

personality types and anxiety levels, which would allow for valid data. Such findings would have greater contributions to mental health care and may influence policy decisions that involve isolation situations. Future research is needed to continue to examine ways to intervene with students who may be experiencing multiple stressors during college.

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APPENDIX A

SURVEY QUESTIONNAIRE

UCF Study: COVID-19 and Mental Health

Consent : Thank you for your interest in this study! Before beginning the survey, please acknowledge you have reviewed the Explanation of Research form and agree to participate in the study.

- ○ Yes, I acknowledge
- ○ No, I do not acknowledge

What is your age?

_____

Choose one or more races that you consider yourself to be

- ☐ White or Caucasian
- ☐ Black or African American
- ☐ American Indian/Native American or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ Other
- ☐ Prefer not to say

What is your gender identity?

- ○ Male
- ○ Female
- ○ Non-binary / third gender
- ○ Prefer not to say

What is your year in school?

- ○ Freshman
- ○ Sophomore
- ○ Junior
- ○ Senior
- ○ Graduate Student

The following is a list of common mental health symptoms. Please carefully read each item in the list. Indicate how much you were bothered by the following symptoms **before the start of the pandemic** (2019).

	Not at all (1)	Mildly, but it didn't bother me much (2)	Moderately, it was uncomfortable at times (3)	Severely, it bothered me a lot (4)
Numbness or tingling	○	○	○	○
Feeling hot	○	○	○	○
Wobbliness in legs	○	○	○	○
Unable to relax	○	○	○	○
Fear of worst happening	○	○	○	○
Dizzy or lightheaded	○	○	○	○
Heart pounding/racing	○	○	○	○
Unsteady	○	○	○	○
Terrified or Afraid	○	○	○	○
Nervous	○	○	○	○

How much you were bothered by the following symptoms **before the start of the pandemic** (2019).

	Not at all (1)	Mildly, but it didn't bother me much (2)	Moderately, it was uncomfortable at times (3)	Severely, it bothered me a lot (4)
Feeling of choking	○	○	○	○
Hands trembling	○	○	○	○
Shaky or unsteady	○	○	○	○
Fear of losing control	○	○	○	○
Difficulty in breathing	○	○	○	○
Fear of dying	○	○	○	○
Scared	○	○	○	○
Indigestion	○	○	○	○
Faint or lightheaded	○	○	○	○
Face feeling flushed	○	○	○	○
Hot or cold sweats	○	○	○	○

Now, please read each item on the list and indicate how much you were bothered by the following symptoms during the **height of the COVID-19 pandemic** (e.g., emergency lockdowns, social distancing, mandated masks, vaccinations).

	Not at all (1)	Mildly, but it didn't bother me much (2)	Moderately, it was uncomfortable at times (3)	Severely, it bothered me a lot (4)
Numbness or tingling	○	○	○	○
Feeling hot	○	○	○	○
Wobbliness in legs	○	○	○	○
Unable to relax	○	○	○	○
Fear of worst happening	○	○	○	○
Dizzy or lightheaded	○	○	○	○
Heart pounding/racing	○	○	○	○
Unsteady	○	○	○	○
Terrified or Afraid	○	○	○	○
Nervous	○	○	○	○

How much you were bothered by the following symptoms during the **height of the COVID-19 pandemic** (e.g., emergency lockdowns, social distancing, mandated masks, vaccinations).

	Not at all (1)	Mildly, but it didn't bother me much (2)	Moderately, it was uncomfortable at times (3)	Severely, it bothered me a lot (4)
Feeling of choking	○	○	○	○
Hands trembling	○	○	○	○
Shaky or unsteady	○	○	○	○
Fear of losing control	○	○	○	○
Difficulty in breathing	○	○	○	○
Fear of dying	○	○	○	○
Scared	○	○	○	○
Indigestion	○	○	○	○
Faint or lightheaded	○	○	○	○
Face feeling flushed	○	○	○	○
Hot or cold sweats	○	○	○	○

For the next questions, reflect on your personal identity. Using the stem below, indicate how much you agree or disagree with the following statements.

I see myself as someone who...

	Disagree Strongly (1)	Disagree a little (2)	Neither agree or disagree (3)	Agree a little (4)	Agree strongly (5)
Is talkative	○	○	○	○	○
Is depressed or blue	○	○	○	○	○
Is reserved	○	○	○	○	○
Is relaxed and handles stress well	○	○	○	○	○
Is full of energy	○	○	○	○	○
Can be tense	○	○	○	○	○
Generates a lot of enthusiasm	○	○	○	○	○
Worries a lot	○	○	○	○	○

Indicate how much you agree or disagree with the following statements.

I see myself as someone who...

	Disagree Strongly (1)	Disagree a little (2)	Neither agree or disagree (3)	Agree a little (4)	Agree strongly (5)
Tends to be quiet	○	○	○	○	○
Is emotionally stable, not easily upset	○	○	○	○	○
Has an assertive personality	○	○	○	○	○
Can be moody	○	○	○	○	○
Is sometimes shy or inhibited	○	○	○	○	○
Remains calm in tense situations	○	○	○	○	○
Is outgoing, sociable	○	○	○	○	○
Gets nervous easily	○	○	○	○	○

APPENDIX B

PERSONALITY SCORING

Question	**Category**
Is talkative	Extraversion
Is depressed or blue	Neuroticism
Is reserved	Extraversion*
Is relaxed and handles stress well	Neuroticism*
Is full of energy	Extraversion
Can be tense	Neuroticism
Generates a lot of enthusiasm	Extraversion
Worries a lot	Neuroticism
Tends to be quiet	Extraversion*
Is emotionally stable, not easily upset	Neuroticism*
Has an assertive personality	Extraversion
Can be moody	Neuroticism
Is sometimes shy or inhibited	Extraversion*
Remains calm in tense situations	Neuroticism*
Is outgoing, sociable	Extraversion
Gets nervous easily	Neuroticism

*Responses were reverse scored. The response was subtracted from 6 before adding to the total.