COVID-19 Stress: Relationships with Resilience and the Big Five Personality Traits

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Abstract

The COVID-19 pandemic is a chronic stressor faced by individuals, globally. Notably, some individuals may either struggle or thrive during the COVID-19 pandemic. Previous research has shown that resilience and the Big Five personality traits are factors that influence perceived stress, yet not all three have been studied together. The current study examined how resilience and the Big Five predict perceived stress associated with COVID-19. Participants consisted of 132 undergraduate students enrolled in a first-year psychology course from Brandon University, who completed a survey composed of demographic questions, COVID-19 Stressors Scale, 10-item Connor-Davidson Resilience Scale (CD-RISC-10), and Big Five Inventory (BFI). Pearson correlations were carried out to examine the relationships between the key variables, and multiple regression analyses were conducted to predict COVID-19 stress from resilience and the Big Five. It was expected that perceived stress associated with COVID-19 would be strongly, positively correlated with resilience, Conscientiousness, Openness to experience, and Extraversion, whereas it would be inversely correlated with Agreeableness and Neuroticism. Further, it was expected that COVID-19 stress would be predicted by resilience, Openness, and Neuroticism. Although the perceived stress associated with COVID-19 did not correlate as expected with resilience and all of the Big Five personality traits, Extraversion was strongly, positively correlated with COVID-19 stress. In addition, resilience was strongly, positively correlated with Openness to experience, Conscientiousness, Extraversion, and negatively correlated with Neuroticism. A regression analysis showed that resilience was predicted by Extraversion, Openness to experience, and Neuroticism. A key implication of this study is that sociable individuals may experience more perceived stress associated with COVID-19.

Keywords: COVID-19, pandemic, perceived stress, resilience, Big Five

How COVID-19 Stress is Predicted by Resilience and the Big Five Personality Traits

The COVID-19 pandemic has proven to be one of the ultimate threats to livelihoods globally. Characterized by fear of infection (Wissmath et al., 2021), the need for physical distancing (DeAngelis et al., 2021), lockdown challenges (Droit-Volet et al., 2020; Wissmath et al., 2021), and concerns with social integrity (Li & Liu, 2017), the COVID-19 pandemic has made an immeasurable impact on the world. Progress made towards mitigating the positive test rate is quickly diminished through spikes in cases (Wissmath et al., 2021), which delays the return to normalcy. On an individual level, the stress that individuals experience will vary depending on personality traits as well as their tendencies to function in a resilient way (Oshio et al., 2018; Zacher & Rudolph, 2021). Therefore, resilience and other, specific traits may be associated with the ability to persevere through the challenges of the COVID-19 pandemic. The purpose of this study was to explore the relationships between resilience and specific personality traits with perceived stress associated with the COVID-19 pandemic.

Literature Review

The research literature has conceptualized stress in various ways. For example, Selye (1982) defined stress as the "*nonspecific result of any demand upon the body*" (p. 7). Pearlin et al. (1981) considered stress to arise from specific or ongoing events. Furthermore, stress may originate from a range of factors including perception of loss, threat, arousal, exhaustion, physiological changes, social detachment, life events, and recurring daily stressors (Hobfoll, 1989; Pearlin et al., 1981; Rose, 2009; Selye, 1982).

Specific stressors may be either controllable or uncontrollable (Koolhaas et al., 2011), and unfortunately, they may overlap and interact with one another. The result is that stress may not be relieved after dealing with only one stressor (Lepore & Evans, 1996). Ultimately, the

extent that stressors are overwhelming will be moderated by the perceived threat of stressors (Koolhaas et al., 2011; Li & Lyu, 2020), and the degree to which individuals cope with them (Holahan et al., 1996; Rose, 2009). Those who are resilient will persevere and problem-solve to overcome stress through adaptive coping strategies.

The COVID-19 pandemic has been deemed a global crisis and a chronic stressor (Droit-Volet et al., 2020; Tambling et al., 2021). The situations arising from the COVID-19 pandemic, such as mental health challenges, (Eubank et al., 2021; Tambling et al., 2021) have contributed to its unique impact. Furthermore, despite the growing availability of vaccines, the threat of the pandemic has persisted along with continuing social restrictions given the continued spread of the virus (Adamson et al., 2020).

In addition to the broad challenges arising from the pandemic itself, typical day to day stressors continue. For every stressor one has, there is the added stressor where the activity is aggravated by the restrictions. For example, in order to enter certain businesses, individuals had the added stressor of a vaccination requirement. Further, lockdowns led to work-from-home measures, which added additional stress if young children were at home requiring remote learning. As well, individuals may have missed their friends, but restrictions prevented the opportunity to reconnect in-person, which further exacerbated the social isolation experienced. In sum, day-to-day routines were more stressful due to the imposed restrictions and risks of the pandemic combined with other responsibilities.

Li and Lyu (2020) explored the relationship between mental health concerns and COVID-19 to understand how relevant factors influence and moderate one another. A total of 693 Chinese adults completed an online survey pertaining to perceived stress of the pandemic, anxiety, depression, perspective of time, mental health, perceived epidemic risk, and confidence

in society. The outcomes revealed that perceived stress reduced depression, anxiety, and epidemic risk. Interestingly, positive future thinking moderated the perceived stress on depression. The authors argued that being properly informed about pandemic risks, employing positive futuristic thinking, and seeing a balance of positive and negative news may help to motivate an individual to move forward under difficult circumstances.

To understand the impact of the pandemic on psychological well-being, Wissmath et al. (2021) conducted a study to explore the factors contributing to stress of the first lockdown. A sample of 1565 Swiss participants completed measures of general perceived stress as well as a measure of factors specifically associated with COVID-19 including their fears about infection, social support, agreement with restrictions, and positive thinking during the lockdown. Notably, greater reported worries about the consequences of COVID-19, in particular, were associated with greater perceived stress, compared to the other factors. Additionally, worries about the consequences of COVID-19 increased due to fear of the virus. Stress was negatively correlated with positive thinking and overall social support. Wissmath et al. (2021) reasoned that worry was most predicted by fear of the virus whereas focusing on the positives in difficult circumstances lessened perceived stress. Furthermore, it was crucial to draw on social supports in the effort to reduce stress experienced by individuals and to avoid complete social isolation. This study is significant because the authors proposed that future studies assess for personality traits that may contribute to stress. Exploring how personality traits (e.g., the Big Five personality traits) are related to COVID-19 stress would helpful as it may provide insight as to which personality traits buffer or amplify stress experienced.

Undoubtedly, stress and resilience are connected. Despite hardships, a resilient person has the ability to bear with heartache and make the sacrifices necessary to accomplish their goals.

With COVID-19 as a stressor, it makes sense that individuals' resilience would contribute to helping individuals survive and thrive despite the ongoing uncertainty of a pandemic. Choosing to adapt to challenges and meet them head on is the mark of resilient individuals. As such, resilience should be a particularly important factor that would help individuals to cope during the pandemic, especially given the need to face multiple stressors.

Researchers have conceptualized resilience in diverse ways. For example, it is often conceptualized as bouncing back from or adapting to adversity or challenges (Aburn et al., 2016; Earvolino-Ramirez, 2007; Fletcher & Sarkar, 2013; Garcia-Dia et al., 2013; Liu et al., 2017) and as the ability to positively adapt to changing circumstances (Aburn et al., 2016; Earvolino-Ramirez, 2007; Fletcher & Sarkar, 2013; Ong et al., 2018; Southwick et al., 2014). Resilience is evident through several attributes or behaviors. For example, individuals who show resilience may exhibit determination, positive affect, positive self-esteem, hope, and rely on healthy social supports and a sense of humour as part of managing in difficult circumstances (Earvolino-Ramirez, 2007; Garcia-Dia et al., 2013; Ong et al., 2018; Smith et al., 2010). Protective factors of resilience may be internal (e.g., personality traits such as Conscientiousness) or external (e.g., supportive family and quality of environment, Garcia-Dia et al., 2013; Ungar, 2013).

Liu and colleagues (2017) provided a compelling three-layer model that explained resilience. The Multi-System Model of Resilience (MSMR), at its core, resilience consists of health behaviours, stress-response regulation, and other biological factors that contribute to resilience across individuals' lifespans. A second layer, internal resilience, includes skills or lessons learned, like self-control, communication proficiency, mental hardiness, mindfulness, and coping strategies, from engagement with family, friends, and peers in addition to personal experiences. Third, the external resilience layer includes resources that support community

resilience like employment opportunities and mental health services. This conceptualization is

particularly important given its emphasis on multiple components of resilience. Furthermore, this

model relates to the understanding noted by Garcia and colleagues (2013) and Ungar (2013) that

resilience is related to internal and external factors, where Liu and colleagues (2017) illustrated

the contribution of each type of factor to fostering resilience.

　　　　Along with the MSMR model by Liu et al. (2017), other studies that have examined

resilience is related to personality. For example, Smith et al. (2010) administered a survey to

2,259 students in New Mexico with measurements for resilience, emotionality, physical

symptoms, and perceived stress to study how individuals' health is correlated with resilience.

Findings showed that greater resilience was associated with lower perceived stress, more positive

and negative affect, and reduced physical symptoms of stress. Importantly, the findings

significant because the authors demonstrated that there are mediating effects of resilience in the

form of emotionality and wellness. Furthermore, Valiente and colleagues (2021) studied the

psychological reactions of individuals to the COVID-19 pandemic to study the factors that

predict the prevalence of resilience. A total of 1628 Spanish participants completed an online

survey concerning resilience, futuristic thinking, and uncertainty. Findings showed that resilience

was associated with being male, older in age, having no previous mental health concerns, and

overall good psychological well-being. Moreover, resilience was associated with low scores for

anxiety, substance use, fixation on economic instability, loneliness, resisting change, and

distrust. In particular, resisting change and experiencing anxiety were related to two of the Big

Five personality traits, Openness to experience and Neuroticism, respectively. Resisting change

is indicative of low scores on the Openness subscale and prevalence of anxiety relates to higher

scores on the Neuroticism subscale. Since the circumstances around COVID-19 have been

somewhat unpredictable and the magnitude of its influence is far-reaching, it is noteworthy how some personality traits may foster the presence or absence of resilience during the pandemic.

The ability to adapt to stress certainly may be related to resilience, and similarly, it should also be related to our general tendencies to think and act. In fact, as noted above, in the MSMR proposed by Liu et al. (2017) and discussed above, the second sphere of internal resilience aligns with personality. Given that one element of resilience can be described as influenced by individual differences, it makes sense that resilience, and stress, would be related to personality factors. In particular, the Five Factor Model (FFM, McCrae & John, 1992) provides a multifaceted conception of personality that has been studied broadly.

Personality traits are described as the "relatively stable patterns of behavior, thoughts, and emotions" (McCrae & Costa, 2003, as cited in Parks-Leduc et al., 2015, p. 3). According to Allport (1931), *traits* go beyond being a habit, fluctuate in nature, are independent to a degree, are not the same as morality, opposite actions do not discredit the existence of a trait, and can be viewed from individualistic to a community distribution of traits (Allport, 1931, as cited in Deary, 2009, p. 94). Examining personality traits pertains to the desire to address similarities and differences of individuals in terms of observable behaviour and outcomes that are relatively consistent over time. One way of conceptualizing personality is through the Big Five which pertains to Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Individuals who demonstrate Openness to experience are curious and creative (Fischer & Boer, 2015; Parks-Leduc et al., 2015). Extraverted individuals are outgoing and excitement-seeking and Conscientious individuals are self-disciplined and achievement-oriented. (Das & Arora, 2020; Fischer & Boer, 2015; Parks-Leduc et al., 2015). Agreeable individuals are

cooperative, and trusting (Parks-Leduc et al., 2015), whereas Neurotic individuals are subject to negative mood and reactivity (Das & Arora, 2020; Fischer & Boer, 2015).

Several studies have examined personality and resilience such as the meta-analysis by Oshio et al. (2018), where the purpose of the study was to differentiate psychological resilience from ego-resiliency in terms of the Big Five personality traits. Resilience was positively correlated with Openness, Agreeableness, Conscientiousness, and Extraversion, whereas it was negatively correlated with Neuroticism. Furthermore, Das and Arora (2020) studied the interaction between personality and resilience. One hundred and fifty young adults living in India completed a survey measuring resilience and the Big Five. Resilience was found to be strongly correlated with Conscientiousness, Extraversion, and Openness, whereas it was negatively correlated with Neuroticism and had no correlation with Agreeableness. Both findings by Oshio et al. (2018) and Das and Arora (2020) are important because it provides the breakdown of personality traits in relation to resilience empirically instead of only theoretically.

In light of the pandemic, Zacher and Rudolph (2021) explored how perceived stress from the COVID-19 pandemic was predicted by the Big Five personality traits. A total of 588 full-time employees in Germany were evaluated at five points starting in April 2020 to September 2020. Participants completed a survey measuring personality and stress appraisal. For April 2020 to July 2020, perceived stress was elevated during the first lockdown and deescalated from July to September. Extraversion was noted to be associated with higher stressfulness and Neuroticism was associated with reduced stressfulness. One limitation for this study included how contextual variables (e.g., responsibilities outside of work) were not accounted for and the researchers recommended that future studies examine the interactions between the Big Five personality traits in relation to COVID-19.

The Current Study

Overall, the literature has demonstrated that COVID-19 has emerged as a key chronic stressor, where a multitude of stressors overlap. The literature discussed above also indicated the relevance of resilience and the Big Five personality traits as related to the perceived stress associated with the COVID-19 pandemic. As a result, taking into account the recommendations of Wissmath et al. (2021) and Zacher and Rudolph (2021), the current study explored the relationships between perceived stress associated with the pandemic and resilience and the Big Five personality traits. Exploring how resilience and the Big Five personality traits are related to COVID-19 stress provided insight as to how individual differences may be related to perceived stress when faced with adverse circumstances. Findings for this research will add to the growing literature on the impact of COVID-19 and to specify which factors are related to individuals' perceptions of stress in these unique circumstances.

Several studies have examined the relationship between either perceived stress and resilience (e.g., Das & Arora, 2020; Oshio et al., 2018; Smith et al., 2010) or resilience and personality (e.g., Wissmath et al., 2021; Zacher and Rudolph, 2021). Yet, COVID-19 stress, the Big Five, and resilience have not been examined together. As a unique stressor, the stress associated with COVID-19 is particularly significant and different from the perceived stress examined in other studies prior to the pandemic (e.g., only measured general day-to-day stress, Eubank et al., 2021; Wissmath et al., 2021), given the uncontrollable nature of the circumstances (e.g., instability associated with product shortages and inflated retail and fuel prices). Resilience is a relevant individual difference as it relates to managing stress and the Big Five personality traits influence stress responses. Further, this study focused on undergraduate students as the context for the variables of interest. In particular, an examination of these variables with a

university sample offered an opportunity to examine a group of participants who have layers of demands associated with the pandemic. That is, they were managing with the everyday experiences of responsibilities as undergraduate students as well as the demands of the restrictions and precautions associated with living through a pandemic.

Given previous research, it was expected that individuals who reported lower perceived stress associated with COVID-19 also reported greater resilience, Conscientiousness, Openness to experience, and Extraversion. Second, it was expected that greater perceived stress associated with COVID-19 would be negatively correlated with Agreeableness and Neuroticism. Third, it was expected that a significant proportion of the variance in perceived stress associated with COVID-19 would be predicted by resilience, Openness to experience, and Neuroticism because they would have the strongest correlations with COVID-19 stress compared to the other personality traits.

Method

Participants

A total of 140 first year psychology undergraduate students attending Brandon University participated in this study. Participants were recruited from first year psychology courses at Brandon University, and all received a course credit of 1% bonus mark towards their final grade for participating in the study. Eight of these students were removed from the sample (n=132) given that four participants were over the age of 32 years, since life experience may be associated with greater ability to manage stress. In addition, three participants' scores were excluded from the analyses as outliers (greater than three standard deviation difference on particular scales), and one participant was excluded entirely from data analyses since they did not complete all of the measures.

Approximately 90% (n=119) of participants were between the ages of 18-25 years old (*Mean*=20.3; *SD*=3.13). Additionally, approximately 78% (n=103) of participants identified as female, and 71% identified as (n=90) Caucasian and 13% (n=16) as Indigenous. As well, a majority (80%, n=102) of the participants were first- or second-year students (see Table 1).

Measures

The study included the use of demographic questions and three scales: COVID-19 Stressors Scale, 10-Item Connor Davidson Resilience Scale (CD-RISC-10), and Big Five Inventory (BFI). The demographic questionnaire, developed for this study, required participants to provide information about participants' age, gender, ethnicity, and year of study (see Appendix A).

Developed by Tambling et al. (2021), the COVID-19 Stressor Scale was used to obtain an index of participants' perceptions of the circumstances related to the pandemic. This measure was recently developed to examine the complexity of stressors from the COVID-19 pandemic including infection stressors (e.g., "risk of unintentionally infecting other people"), daily routine stressors (e.g., "changes to social routines"), and resource stressors. (e.g., "loss of current job security or income"; see Appendix B). This scale is a revised version of the original 23-item COVID-19 Stressors Scale created by Park et al. (2021). For this measure, participants indicated "yes" or "no" regarding whether they have, in the last week, experienced each stressor, and then, if "yes" is chosen, they rated the stressfulness of that particular experience (1 = not stressful at all to 5 = "extremely stressful). Given that this scale is unidimensional, higher total scores are indicative of higher COVID-19 stress experienced. An alpha of .91 was found for this study, consistent with previous literature (i.e., .96, Tambling et al., 2021). Previous research has shown that this measure has convergent validity when compared to the Generalized Anxiety Disorder

Scale (GAD) and the Perceived Stress Scale (PSS) with values of $r = .54$ and $r = .46$, respectively (Tambling et al., 2021).

The resilience measure used was the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) created by Campbell-Sills and Stein (2007), which is a unidimensional 10-item scale with statements regarding perseverance, ability to adapt, and clarity under pressure. Although resilience may be described as multidimensional (e.g., Liu et al., 2017), the CD-RISC-10 scale was utilized as it encompasses the universal understanding of resilience as bouncing back or adapting to difficult circumstances (Aburn et al., 2016; Earvolino-Ramirez, 2007; Fletcher & Sarkar, 2013; Garcia-Dia et al., 2013; Liu et al., 2017). This scale is the revised version of the original 25-item Connor-Davidson Resilience Scale created by Connor & Davidson (2003). Participants scored responses on a Likert scale of never (0) to true nearly all the time (4) for their experience in the past month (Aloba et al., 2016; Campbell-Sills & Stein, 2007). Two sample items are "able to adapt to change" and "think of myself as a strong person when facing challenges" (see Appendix C). Total scores range between 0 to 40, with higher scores indicative of more resilience. For the current study, an alpha of .85 was calculated, consistent with previous research (e.g., .81, Aloba et al., 2016; .85, Campbell-Sills & Stein, 2007). No previous research was available to confirm the validity of the CD-RISC-10 measure.

The Big Five personality traits were measured through the Big Five Inventory (BFI, John & Srivastva, 1999). Developed by John et al. (1991), the 44-item BFI is designed to measure each Big Five personality trait (e.g., Openness to experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism) through brief statements of 8-10 items each. Sample items include "is curious about many different things" (Openness), "does a thorough job" (Conscientiousness), "is full of energy" (Extraversion), "has a forgiving nature" (Agreeableness), and "worries a lot"

(Neuroticism) (see Appendix D). A Likert scale of Strongly Disagree (1) to Strongly Agree (5) is

used to calculate scores. (John & Srivastva, 1999). As well, some items for each personality trait

are reverse scored. The total for each personality trait will be calculated where the higher score

for a personality trait, the more predominant this trait will be found in the person. Internal

consistency for the subscales in the current study were .72 for Openness to experience, .81 for

Conscientiousness, .87 for Extraversion, .76 for Agreeableness, and .83 for Neuroticism. These

values align with previous studies where internal consistency is similar for each subscale (e.g.,

.78 for Openness, .81 for Conscientiousness, .87 for Extraversion, .81 for Agreeableness, .82 for

Neuroticism, Arterberry et al., 2014; .74 for Openness, .77 for Conscientiousness, .83 for

Extraversion, .77 for Agreeableness, .74 for Neuroticism, Tkach & Lyubomirsky, 2006), which

should be close to .80 (John & Srivastava, 1999). The BFI measure has convergent validity with

a mean value of $r = .75$ when compared with the Trait Descriptive Adjectives (TDA) and the

Neuroticism-Extraversion-Openness Five-Factor Inventory (NEO-FFI) (John & Srivastava,

1999).

Procedure

Using MS Forms, the survey was created containing the informed consent for the study

and the measures. The survey was provided through a weblink that is connected to the Brandon

University data system to ensure confidentiality is maintained. After ethics approval was

obtained from Brandon University Research Ethics Committee (BUREC), recruitment began in

January by requesting permission from psychology professors to present information about the

study to their introductory courses. A 5-10-minute presentation was provided through the Zoom

class format and students were invited to ask questions following the presentation. Through the

course instructor, students were provided with a weblink for the consent, survey, and debriefing

section through MS Forms, through the course management system, that is connected to the

Brandon University data system to ensure confidentiality for participants' completed measures.

Comprised of demographic questions and the relevant measurement scales, the measures were

counterbalanced so that there was a different order or sequence of questionnaires for each class

from which the participants were recruited. On average, the survey was completed by the

participants in approximately 10-20 minutes. Participants provided their student number on the

debriefing section at the end of the study in order to obtain their bonus 1% for participation.

Results

First, data from MS Forms were uploaded as EXCEL spreadsheets, then copy-and-pasted

into SPSS. Once data had been coded into SPSS, frequencies and means were calculated for all

variables across all participants (see Table 2). Once scale scores were summarized, outliers

(standard scores greater than +3.0 and less than -3.0) were removed. A preliminary analysis was

conducted in order to determine any effects based on order of the measures. No significant order

effects were found. As summarized in Table 2, participants scored high in Agreeableness with an

average mean score of 4.0 on a scale of 1-5, whereas moderately high scores were found for the

remaining Big Five personality traits. As well, participants scored an average of 2.7 for resilience

on a 0-4 scale. Moreover, mean scores for the COVID-19 Stressor Scale was approximately 2.0

on a five-point scale.

Second, Pearson correlations were carried out in order to analyze the significance of

relationships between perceived stress associated with COVID-19, resilience, and the Big Five

personality traits. As shown in Table 3, contrary to what was expected, only Extraversion was

significantly, positively correlated with perceived stress associated with COVID-19. In addition,

individuals who reported greater resilience reported greater Openness to experience,

Conscientiousness, Extraversion, and less Neuroticism.

Given that the expected correlations did not arise for perceived stress associated with

COVID-19, a regression analysis was conducted to predict resilience from Openness to

experience, Neuroticism, Extraversion, and Conscientiousness (see Table 4). Approximately

38.4% of the variance in resilience was accounted for by these variables, of which Openness to

experience, Neuroticism, and Extraversion were significant predictors. Specifically, students

who were more resilient reported greater open-mindedness, greater extraversion, and lesser

anxiety.

In addition, in further examining the perceived COVID-19 stress variable, the data was

split by gender, and an additional set of Pearson correlations were conducted for all the variables

of interest (see Table 5). For men, perceived stress associated with COVID-19 was positively

correlated with Agreeableness. In addition, resilience was significantly, positively correlated

with Openness to experience and Extraversion, and negatively correlated with Neuroticism. For

women, perceived stress associated with COVID-19 was positively correlated with Extraversion.

As well, resilience was positively correlated with Openness to experience, Extraversion,

Conscientiousness, and negatively correlated with Neuroticism.

Given these gender differences, a linear multiple regression was conducted to predict

perceived stress associated with COVID-19, with gender and Extraversion as predictors. The

purpose of the regression analysis was to explore these two variables that were significantly

correlated with COVID-19 stress in previous analyses. As Table 6 indicates, 8.5% of the

variance was accounted for, with Gender as the only statistically significant predictor of

perceived stress associated with COVID-19. Specifically, students who had greater perceived stress associated with COVID-19 were more likely to be female.

Discussion

The purpose of this study was to explore first year psychology students' perceived stress associated with COVID-19 and its relationships with resilience and the Big Five personality traits. As expected, Extraversion was positively correlated with perceived stress associated with COVID-19, which is supported by previous literature (e.g., Zacher & Rudolph, 2021). This finding made sense given that having to practice physical distancing and reducing social contacts would be difficult for extraverted individuals, resulting in more perceived stress associated with COVID-19. Furthermore, resilience was strongly, positively correlated with Openness to experience, Conscientiousness, and Extraversion and a negative correlation with Neuroticism. Resilient participants were also open-minded, mindful, sociable, and less anxious. These findings are congruent with previous resilience and personality studies (e.g., Das & Arora, 2020; Oshio et al., 2018).

Contrary to what was expected, perceived stress associated with COVID-19 was related to extraversion but was not significantly related resilience, Openness to experience, or Conscientiousness. Based on the study by Smith et al. (2010), resilience should have been significantly correlated with perceived stress given that resilience is an adaptive response for managing stress. As well, it was surprising that Openness to experience was not significantly correlated with perceived stress, given that the pandemic has challenged and changed many day-to-day norms. Moreover, contrary to the hypothesis, perceived stress associated with COVID-19 was not significantly correlated with either Agreeableness or Neuroticism. In particular, it was unexpected that Neuroticism was not significantly correlated with COVID-19 stress since it

would make sense that anxiety and perceived stress would be correlated, consistent with past

research (e.g., Zacher & Rudolph, 2021). For instance, the study by Wissmath et al. (2021) found

that greater reported worries about the COVID-19 pandemic were correlated with perceived

stress. Although COVID-19 worries and perceived stress were not the same as the current study,

initially it seemed reasonable to hypothesize a similar outcome would occur for the current

study. Given the insignificant correlations, it was not worthwhile to complete a linear multiple

regression predicting perceived stress associated with COVID-19, as initially proposed.

Despite some of these unexpected findings, this study extends findings of previous

research in that it demonstrated that the developed COVID-19 Stressor Scale had few

meaningful findings when compared with other general measures. While there were other scales

available for measuring perceived stress, the CSS provided items that were specific to the present

pandemic context. Therefore, it was evident that additional stress measures may have been

required to have better outcomes. Furthermore, this study demonstrated that gender differences

may play in understanding perceived stress and resilience. Greater perceived stress associated

with COVID-19 was found in highly Agreeable men reported higher scores for Agreeableness

and women reported higher scores for Extraversion. Understanding gender differences provides

insight as to which personality traits predispose men or women to greater stress during the

pandemic.

The reasons for the different outcomes in the study should be contemplated. One

possibility may include that perhaps because the CSS measure was intentionally specific, it was

not useful as a means of examining stress during the restrictive times of COVID-19 with the

other general measures. Yet, for the purpose of the study, it would have defeated the purpose to

not use a scale that specifically addressed the COVID-19 pandemic. For the current study,

COVID-19 was a factor that contributed to overall stress, but an additional stress measure would have taken into account common non-pandemic stressors that contribute to overall stress. In contrast, the CD-RISC-10 scale provided more significant correlations given that the items included are general. In this way, it would have been best to use either a general stress measure or use both a general stress measure and COVID-19 stress measure for better outcomes. In general, COVID-19 stress may reflect the stress individuals feel but the reverse may be true. For example, individuals may need to work extra hours to meet financial goals and pay off debts but this is not possible if an individual is either infected with COVID-19 or forced to quarantine because of matching symptoms. There are multiple layers to stress itself, where COVID-19 is only one contributor to overall stress individuals experience. Thus, it seems that the CSS scale itself may have contributed to the lack of significant findings given the specificity of items.

A second possible explanation for unexpected findings for all of the hypotheses may be that there was a gender imbalance. Comparing groups of participants based on gender may not have been beneficial given that there were significantly more females than males. In this way, the male portion of the sample may not be representative of the general male population and overall findings may have been biased towards female participants. Therefore, the use of gender as a variable of interest may not have been best to include for analyses.

A final factor that may have affected the outcomes is the age of the sample. With age comes life experience, which older participants would have an advantage of experiencing past hardships that have fostered their resilience prior to the pandemic. Ages for the participants ranged from 18 to 32, where mature students in a first-year psychology course would have a greater recollection of adversity to draw from when managing stress from the pandemic. Furthermore, some students may have undergone more challenging life experiences prior to post-

secondary studies that could have contributed to maturity differences, although this was not assessed. As well, 10% of the participants were third to sixth year post-secondary students, which may have given such participants an academic advantage where they have been exposed to more Likert scale questionnaires and have previously learned academic strategies to help them to thrive in the pandemic. Thus, age and year of study may have played a role for resilience demonstrated and stress management, but this would be minor given that there were significantly fewer participants over the age of 25 years and above second year of study. Taken together, the above possible explanations for unexpected outcomes.

Several meaningful and unique outcomes emerged from this study. For instance, resilience was significantly, positively predicted by Openness to experience and Extraversion and negatively predicted by Neuroticism. This finding was important as it inferred individuals who embodied these personality traits were more likely to be resilient. Interestingly, resilience had a unique relationship with the Big Five personality traits and gender in the additional correlational and regression analyses. Notably, resilience emerged as a central individual difference that was strongly related to most of the Big Five factors and gender differences, as discussed above. Gender significantly predicted perceived stress associated with COVID-19. Therefore, women were more likely to experience stress associated with the pandemic, given that the majority of participants were female. This finding was supported by a study by Adamson et al. (2020), where perceived stress was higher for females when studying factors that may be connected to perceived stress during the beginning of the COVID-19 pandemic. Given the findings from the current study and past research, gender is important when studying perceived stress.

Overall, this study showed that perceived stress associated with COVID-19 is correlated with some of the Big Five personality traits. Given that the central focus on perceived stress associated with COVID-19 was not well supported by the findings, it is important for future studies to consider using two stress measures, one general and one COVID-19 specific. Including two measures would likely yield better outcomes given that it would provide a well-rounded measurement of stress. Second, future studies could explore how gender is related to COVID-19 stress and resilience.

Regardless of the addressed limitations, this study contributes to the growing literature on stress experienced during the pandemic. In particular, this study demonstrated that individuals who are more sociable may experience greater COVID-19 stress. As well, this study supported previous literature that resilience is related to most of the Big Five personality traits. At most, the research findings indicated that resilient individuals may be more sociable, tolerant of change, and worry less.

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Table 1. *Sample Characteristics of Participants (n=132)*

Demographic Variable		Total Number of participants (*n*)	Percentage of Total Participants (%)
Age			
	18-25 years old	119	90
	26-29 years old	10	8
	30-32 years old	3	2
Gender			
	Men	27	20
	Women	103	78
	Other	2	2
Ethnicity[1]			
	Caucasian	90	71
	Asian	8	6
	Indigenous	16	13
	African American	10	8
	Hispanic	3	2
Year of Study[2]			
	First and second year	102	80
	Third year	16	13
	Fourth, fifth, and sixth year	9	7

Note. [1]*n*=127 for ethnicity. [2]*n*=127 for year of study.

Table 2. *Descriptive Statistics for All Variables for All Participants (n=132)*

Variable	Mean *(SD)*	Minimum	Maximum
Age	20.3	18	32
	(3.13)		
Perceived COVID-19 Stress[1]	2.0	0	5
	(0.88)		
Resilience[2]	2.7	0	4
	(0.59)		
Openness to Experience[3]	3.5	1	5
	(0.56)		
Conscientiousness[3]	3.7	1	5
	(0.64)		
Extraversion[3]	3.1	1	5
	(0.88)		
Agreeableness[3]	4.0	1	5
	(0.59)		
Neuroticism[3]	3.3	1	5
	(0.76)		

Note: [1] All participants, *n*=128; [2] All participants, *n*=129; [3] All participants, *n*=130.

Table 3. *Correlations Between Perceived COVID-19 Stress, Resilience, and Big Five*

Personality Traits for All Participants (n=132)

	1	2	3	4	5	6	7
1. Perceived COVID-19 Stress	–						
2. Resilience	-.063	–					
3. Openness to Experience	.069	.303**	–				
4. Conscientiousness	-.138	.273**	.064	–			
5. Extraversion	.176*	.431**	.191*	.176*	–		
6. Agreeableness	.028	.085	.028	.222*	.061	–	
7. Neuroticism	.107	-.480**	.082	-.458**	-.373**	-.258**	–

Note: *0.05 significance level (2-tailed). **0.01 significance level (2-tailed).

Table 4. *Linear Multiple Regression Analysis Predicting Resilience (n=132)*

Model	Variable(s) Entered	R^2	R^2 Change	Beta	p value
1	Openness to Experience	.384	.384	.302	.000*
	Neuroticism			-.399	.000*
	Extraversion			.212	.010*
	Conscientiousness			.040	.638

Note: *.05, **.01 significance level.

Table 5. *Correlations of Resilience with Perceived COVID-19 Stress and Big Five Personality Traits for Male (**n=27**) and Female (n=103) Students*

	1	2	3	4	5	6	7
1. Perceived COVID-19 Stress	–	-.082	.080	-.167	.199*	-.104	.086
2. Resilience	**.168**	–	.299**	.267**	.414**	.089	-.464**
3. Openness to Experience	**.000**	**.457***	–	.045	.176	-.002	.059
4. Conscientiousness	**.007**	**.254**	**.164**	–	.185	.232*	-.450**
5. Extraversion	**.047**	**.515***	**.297**	**.124**	–	.040	-.405**
6. Agreeableness	**.390***	**.089**	**.182**	**.310**	**.048**	–	-.271**
7. Neuroticism	**.019**	**-.478***	**.036**	**-.512***	**-.303**	**-.288**	–

Note: *0.05 significance level (2-tailed). **0.01 significance level (2-tailed).

Table 6. *Linear Multiple Regression Analysis Predicting Perceived COVID-19 Stress* (n=132)

Model	Variable(s) Entered	R^2	R^2 Change	*Beta*	*p* value
1	Gender	0.085	0.085	.235	.008*
	Extraversion			.166	.059

Note: **.01 significance level.

Appendix A

Demographic Questionnaire

Appendix A. *Directions:* Please read each question and type your answer as the corresponding

number in the blank provided.

1. What is your age? _____

2. What is your gender? _____

3. What is your ethnicity? (for example: Asian, Black/African, Caucasian, Hispanic/Latino,

Indigenous) _____

4. What year of study are you in? _____

Appendix B

COVID-19 Stressors Scale

Appendix B. *Directions*: For each statement, consider whether the item has been a concern in the **past month** for you (e.g., worrying about it). If the item has not been a concern (No), select "0" on the scale provided. If it has been a concern (Yes), then rate how stressful the item felt in the past week on a scale of 1 "not stressful at all" to 5 "extremely stressful".

Infection-related Stressors:

1. Risk of becoming infected _____

2. Self-monitoring of symptoms _____

3. Risk of loved ones becoming infected _____

4. Risk of unintentionally infecting other people _____

5. Read about or heard others talking about the severity and contagiousness of COVID-19 _____

6. Stigma, shame, discrimination, or social exile related to quarantine or working in a high-risk area (e.g., others shunning you because you work in health care) _____

7. Stigma, shame or discrimination related to being in a certain age-group (e.g., negative statements about Millennials or Generation Z) _____

8. Uncertainty about how long quarantine and/or social distancing requirements will last _____

Daily routine-related stressors

9. Changes to daily personal care routines (e.g., cooking, cleaning, exercise/relaxation, hobbies) _____

10. Changes to daily work routines (e.g., unable to earn money, attend full- or part-time work schedule) _____

11. Changes to daily education routines (e.g., online instruction) _____

12. Changes to social routines (e.g., spending free time with friends/loved ones) _____

13. Changed responsibilities to care for dependents (e.g., childcare, eldercare) _____

14. Cancellation of planned or scheduled celebrations, entertainment, vacations or trips (e.g.,

graduations, birthdays, concerts) _____

15. Cancellation of meaningful personal or religious rituals (e.g., funerals, religious services)

_____

16. Inability to travel (e.g., cancellation of vacations, weekend trips) _____

17. Increased contact with close others or loved ones (e.g., increased conflict, co-worrying)

_____

18. Pressure to "make the most of" COVID-19 or "find a silver lining" while quarantining (e.g.,

social media fitness challenges, encouragement to increase productivity) _____

Resource-related stressors

19. Loss of current job security or income (e.g., inability to earn money) _____

20. Loss of current job training opportunities or education benchmarks (e.g., certification,

apprenticeship, internship or degree completion) _____

21. Potential changes to the national or global economy (e.g., future job prospects, loss of

investments) _____

22. Difficulty accessing important resources for daily life (e.g., health care, food, clothes, water,

housing, medical supplies or prescriptions) _____

23. Inadequate access to reliable information about COVID-19 (including your personal risk of

illness) _____

Appendix C

10-Item Connor-Davidson Resilience Scale (CD-RISC-10)

Appendix C. *Directions:* Please read each item and, on a scale of 0-4, select the corresponding

number for how you have felt in the **past month**.

0 = Not true at all

1= Rarely true

2 = Sometimes true

3 = Often true

4 = True nearly all of the time

1. Able to adapt to change _____

2. Can deal with whatever comes _____

3. Tries to see humorous side of problems _____

4. Coping with stress can strengthen me _____

5. Tend to bounce back after illness or hardship _____

6. Can achieve goals despite obstacles _____

7. Can stay focused under pressure _____

8. Not easily discouraged by failure _____

9. Thinks of self as strong person _____

10. Can handle unpleasant feelings _____

Appendix D

Big Five Inventory (BFI)

Appendix D. *Directions:* Here are a number of characteristics that may or may not apply to you.

Using the 1-5 scale below, indicate your agreement with each item by selecting the

corresponding number. Please be open and honest in your responding.[1]

1 = Disagree strongly

2 = Disagree a little

3 = Neither agree nor disagree

4 = Agree a little

5 = Agree strongly

I see Myself as Someone Who…

1. Is talkative _____

2. Tends to find fault with others _____

3. Does a thorough job _____

4. Is depressed, blue _____

5. Is original, comes up with new ideas _____

6. Is reserved _____

7. Is helpful and unselfish with others _____

8. Can be somewhat careless _____

9. Is relaxed, handles stress well _____

---

[1] Reverse-scored items for the following: 2, 6, 8, 9, 12, 18, 21, 23, 24, 27, 31, 34, 35, 37, 41, and 43.
Extraversion pertains to items: 1, 6, 11, 16, 21, 26, 31, 36.
Agreeableness pertains to items: 2, 7, 12, 17, 22, 27, 32, 37, 42.
Conscientiousness pertains to items: 3, 8, 13, 18, 23, 28, 33, 38, 43.
Neuroticism pertains to items: 4, 9, 14, 19, 24, 29, 34, 39.
Openness pertains to items: 5, 10, 15, 20, 25, 30, 35, 40, 41, 44.

10. Is curious about many different things _____

11. Is full of energy _____

12. Starts quarrels with others _____

13. Is a reliable worker _____

14. Can be tense _____

15. Is ingenious, a deep thinker _____

16. Generates a lot of enthusiasm _____

17. Has a forgiving nature _____

18. Tends to be disorganized _____

19. Worries a lot _____

20. Has an active imagination _____

21. Tends to be quiet _____

22. Is generally trusting _____

23. Tends to be lazy _____

24. Is emotionally stable, not easily upset _____

25. Is inventive _____

26. Has an assertive personality _____

27. Can be cold and aloof _____

28. Perseveres until the task is finished _____

29. Can be moody _____

30. Values artistic, aesthetic experiences _____

31. Is sometimes shy, inhibited _____

32. Is considerate and kind to almost everyone _____

33. Does things efficiently _____

34. Remains calm in tense situations _____

35. Prefers work that is routine _____

36. Is outgoing, sociable _____

37. Is sometimes rude to others _____

38. Makes plans and follows through with them _____

39. Gets nervous easily _____

40. Likes to reflect, play with ideas _____

41. Has few artistic interests _____

42. Likes to cooperate with others _____

43. Is easily distracted _____

44. Is sophisticated in art, music, or literature _____