Social Support Networks as Buffers against The association Between Covid-19 Related Stress and Depression: a Latent Profile, Three-Way Interaction approach

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ABSTRACT

SOCIAL SUPPORT NETWORKS AS BUFFERS AGAINST THE ASSOCIATION BETWEEN COVID-19 RELATED STRESS AND DEPRESSION: A LATENT PROFILE, THREE-WAY INTERACTION APPROACH

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Department of Psychology
Northern Illinois University, 2023
Christine Malecki, Director

BACKGROUND: Since the beginning of the pandemic, approximately one in four people in the general public have experienced moderate to severe levels of stress, which precures the development of depression. Young adults were extremely vulnerable to COVID-19 related stressors developing into mental health disorders (Wang et al., 2020). PURPOSE: The study aimed to explore this vulnerability in a young adult, undergraduate sample. The main purpose was to explore to what extent profiles of sources of social support networks can strengthen or weaken the proposed association between various types of COVID-19-related stress and depression and whether social support was a stronger buffer for women or men in an undergraduate sample. METHODS: The study was a cross-sectional, self-report study of N = 240 undergraduate students from an introductory psychology course. Questionnaires for self-reported depression (Center for Epidemiological Studies- Depression [CES-D]), social support (Child and Adolescent Social Support Scale- College Adapted [CASSS-C]), and COVID-19 related stressors (COVID-19 Traumatic Stress Scale and a modified part of the COVID-19 Adolescent Symptom & Psychological Experience Questionnaire
[CASPE)] were used. Using latent profile analyses (LPA), the study investigated social support as a network of support received from various sources (i.e., family, close friend/significant other, peers, and faculty). Moderation and Moderated Moderation analyses were conducted using PROCESS Macro for SPSS. RESULTS: The study found elevated levels of depression and various types of COVID-19 related stress. Women reported experiencing more depression and more stress overall than men. Older participants and participants who were juniors and seniors reported more stress than younger students like those who were freshman and sophomores. Reports indicated that social support was perceived from various sources and that there were no significant differences in levels of social support by demographics. In addition, results indicated that all types of COVID-19 related stress were positively associated with symptoms of depression. However, both symptoms of depression and COVID-19 related stress (all types) were negatively associated with social support. Three profiles of social support emerged ranging in levels from Higher, Moderate, and Lower with no significant gender differences between them. In addition, profile membership did not moderate the association between COVID-19 related stressors and depression. CONCLUSION: Young adults in college experienced prevalent symptoms of depression and experienced numerous types of stress during the pandemic. Social support broadly served as a protective factor against these negative outcomes. Findings indicate a demand for mental health assessment and intervention in higher education.
NORTHERN ILLINOIS UNIVERSITY
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SOCIAL SUPPORT NETWORKS AS BUFFERS AGAINST THE ASSOCIATION
BETWEEN COVID-19 RELATED STRESS AND DEPRESSION:
A LATENT PROFILE, THREE-WAY INTERACTION
APPROACH

BY

KATHLEEN KELLY
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A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE
DOCTOR OF PHILOSOPHY

DEPARTMENT OF PSYCHOLOGY

Doctoral Director: Christine Malecki, PhD
Graduate school has been an invaluable experience to me. Beyond the unique and instrumental academic experiences my program has graciously provided me, my time spent in the school psychology program has given me the opportunity to form irreplaceable personal relationships with colleagues, many of whom I now call friends. In graduate school, I have spent a considerable amount of time investigating social support as a protective factor against the negative effects of stress. Amidst the pandemic, I read and wrote about an endless influx of research on stress and social support while also experiencing it. I saw in my own life people coming together as families, friends, and community. It was a privilege to be someone who others reached out to for support, and it was a humbling reminder that my life was also in these numbers, as I drew and continue to seek valuable support from my family, friends, and faculty.

In recognizing how irreplaceable social support is, I sincerely thank my family for their unwavering support and encouragement. Further, I want to thank my fellow program members whom I now call friends. I also express my deepest gratitude to my Dissertation Committee: Drs. Michelle Demaray, Kara Styck and Kelly Summers for their feedback, their instruction, and the opportunities they have given me through my graduate career. Finally, I want to profoundly thank my advisor and Dissertation
Chair Dr. Christine Malecki for allowing me to join the PhD track students and for taking me on as an advisee. Most importantly, I want to thank her for the guidance and support she has provided me throughout my training. Her mentorship has helped to shape me professionally and personally and has set me up for a rewarding career in school psychology.
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CHAPTER I
INTRODUCTION

Background and Rationale for the Study

A massive global health crisis struck in the spring of 2020 as COVID-19 became a pandemic. In addition to the physical threat of the virus, the threat of developing mental health pathology has increased due to life disruptions consequential to the pandemic, such as loss of residency or job and social isolation (Kickbusch & Leung, 2020; Lee, Jobe, & Mathis, 2020; Mertens, et al., 2020). Since the beginning of the pandemic, approximately one in four people in the general public have experienced moderate to severe levels of stress, which can be a precursor to the development of depression (Cooke et al., 2020; Khan et al., 2020; Pieteromonaco, Uchino, & Schetter, 2013; Reger et al., 2020; Shanahan, et al., 2020). Young adults are suggested to be perhaps be more vulnerable to COVID-19 related stressors developing into mental health disorders than younger or older populations (Wang et al., 2020).

The current study aimed to explore this vulnerability by using a young adult, college attending sample to explore social support as a protective factor against the association between stress and depression. Depression as an outcome was the focus of the current study in lieu of the other mental health outcomes in young adults like anxiety. This decision was made to avoid overlap between the constructs of stress related to COVID-19 and anxiety. Additionally, past work on social support and anxiety is mixed with many studies suggesting that social support is either not or weakly associated with symptoms of anxiety (Kelly & Malecki, 2021; Rueger et al., 2016). Using latent profile analyses, the study investigated social support as a network of support
received from various sources (i.e., family, close friend/significant other, peers, and faculty/staff). Further, the study assessed to what extent profiles of sources of social support either strengthen or weaken the proposed association between COVID-19 related stress and depression and whether the moderating effect of these proposed profiles on this association was stronger for women or men.
CHAPTER 2
REVIEW OF THE LITERATURE

COVID-19 Stressors for Young Adults

Although young adults are less likely to experience stress over the personal, physical threat of contracting the virus, they do report experiencing other types of stress related to COVID-19, such as fear of infecting others with the virus, social isolation, economic strain, fear of missing events, and other life disruptions (Barzilary et al., 2020; Cohen et al., 2020; Taylor et al., 2020). Late adolescents and young adults are reporting more stress from stressors like social isolation and missing events than they are reporting from catching the virus itself (Reger, et al., 2020). Social isolation is suggested to be a salient stressor in young adult samples as one study found that nearly thirty percent of their sample claimed that being alone and not being able to see people during COVID-19 was the most impactful barrier in their life (Tanhan et al., 2020).

The lack of social connection may be particularly harmful in conditions of high stress because social connection promotes emotional regulation and encourages healthy coping behaviors, which are protective against negative outcomes associated with stress (Tanhan et al.,...
2020; Zhou, 2020). However, some work suggests that social connection during or after a disaster can undermine the protective factors of social support and increase negative framing of support due to an increase in social demands, such as helping a loved one find healthcare (Yao et al., 2015). These demands may decrease the ability to support each other (Ellis et al., 2020; Rajkumar, 2020). For example, young adults who were forced to move in with family or friends during the pandemic report additional stress related to living in close proximity with others for a long period of time (Huskey et al., 2020; Van Bevel et al., 2020; Zhai & Du, 2020). Of importance to the current study, young adults in college may experience more stress than young adults not in college due to having additional academic related stressors both typical and novel to attending college (Patsali et al., 2020; Pragholapati, 2020).

COVID-19 Stressors for Young Adults in College

In addition to typical stress related to being a student, such as obtaining good grades, time management, and motivation, college students are also reporting stress consequential to the pandemic, such as accessing remote learning, increased risk of losing a year of instruction or delaying graduation, and of loss of internship and job opportunities (Aucejo et al., 2020; Hasan & Bao, 2020; Kecojevic et al., 2020; Pragholapati, 2020). In a recent study conducted by Demaray and colleagues (2020), schoolwork stress amidst COVID-19 explained 20-22% of the variance in depressive symptoms reported by high school students. Although the current study is looking at a slightly older population, their results indicate that stress associated with schoolwork may be relevant to a late adolescent college student.
COVID-19 Stress and Depression

Throughout the ongoing pandemic, public health agencies have argued that two health crises are occurring: the rise in COVID-19 cases and the rise of mental health concerns including depression (Czeisler et al., 2020; Islam et al., 2020; Savage, 2020; Wan, 2020; Wang et al., 2020). Ettman and others (2020) found that the prevalence of depressive symptoms during COVID-19 in young adults in the United States increased threefold from reports prior to the pandemic. Relevant to the current study, a study conducted on young adults in Cyprus, Egypt found that reports of depression during COVID-19 were greater for students than non-students (Solomou & Constantinidou, 2020). Although most of the research conducted during the pandemic suggests that both men and women are at increased risk of developing depression (Birditt et al., 2020; McGinty et al., 2020; Montano & Acebes, 2020), when covariates, like socioeconomic status, are included women are found to report more symptoms of depression than men (McGinty et al., 2020; Notivol et al., 2020). This gender difference is perhaps because women are more susceptible to post-disaster stressors, such as unemployment and economic burden, than men (Christiansen & Elklit, 2008; McGinty et al., 2020), which aligns with the cognitive vulnerability-transactional stress model of depression suggesting that exposure to stress increases one’s vulnerability to the development of depression (Hankin & Abramson, 2001). Given the increased levels of stress and depression during pandemic times, research is needed on potential protective factors. One of those factors is social support.
Social Support

Robust work indicates that social support is positively associated with positive outcomes (Cohen & Wills, 1985; Helsen et al., 2000) and negatively associated with negative outcomes in all ages (Cohen et al. 2004; Demaray & Malecki, 2002; Rueger et al., 2016; Weber et al., 2010). A traditional definition proposed by Tardy (1985) identifies various sources that support is received from, including, but not limited to, parents, friends, and peers. Demaray and Malecki (2002), expanded Tardy’s definition by defining social support as supportive behaviors that contribute to the general well-being of a person, which can act as a buffer against the association between stress and negative mental health outcomes. However, a key study by Demaray and Malecki (2002), suggests that a critical level of support may be needed to buffer against the association between stress and negative outcomes.

The critical level, ranging from moderate to high, is suggested to differ by source of support, which converges with work indicating sources of support have differential associations with internalizing outcomes (Demaray & Malecki, 2002; Lyell et al., 2020; Rueger et al., 2016). There are also gender differences in social support such that women appear to benefit more generally from social support while men benefit more from social support in conditions of high stress, which converges with substantial work indicating women perceive more social support overall than men (Demaray & Malecki, 2002; Lazányi, 2017; Rueger et al., 2016). These discrepancies emphasize the need to examine social support as a network as opposed to singular, independent sources (Auerbach et al., 2011; Rueger et al., 2016; Zhao, et al., 2011).
Of particular relevance to the current study, results from a meta-analysis consisting of over 300 studies indicated a significant association between symptoms of depression and many sources of social support (i.e., parents, teachers, peers, and close friends), such that individuals with higher levels of support reported lower levels of depressive symptoms (Rueger et al., 2016). However, as mentioned, a critical level may be needed to buffer against depression (Demaray & Malecki, 2002). This critical level is suggested to be different for each source of social support such that more support from peers is needed to act as a protective factor than the amount of support needed from parents (Coyle et al., 2018; Rueger et al., 2016).

Family Support

Family support emerges as particularly protective above and beyond the support from other sources (Haden et al., 2007; Rueger et al., 2016). Because most research has investigated parent support, the current study largely references studies that have looked narrowly at parent support; however, the current study explores family support broadly because as individuals age, they begin to seek more support from sources outside of their parents (Meadows et al., 2006; Rueger et al., 2016). For example, research on sibling support in young adulthood suggests that emotional closeness between siblings more often declines across young adulthood and increases in early to middle adulthood while conflict between siblings decreases with age including young adulthood (Riggio, 2006; Sherman, Lansford, & Volling, 2006).

Studies exploring parent support find that low levels of parent support are associated with greater reports of depressive symptomatology while moderate or high levels are associated with
fewer reports of depressive symptoms (Lee et al., 2018; Smokowski et al., 2014). Additionally, parent support is suggested to compensate for a lack of support from other sources like friends, but growing evidence suggests that other sources may not compensate for a lack of parent support (Ciarrochi et al., 2017; Coyle et al., 2018; Lyell et al., 2020). Individuals with low parent support appear to report more negative interactions with friends and significant others on an everyday basis than individuals who report having moderate to high levels of parent support (Schacter & Margolin, 2018). However, most studies investigating support from family have utilized school-aged samples. As mentioned, studies using young adult samples have found mixed results, perhaps because young adults begin to seek out and rely on support from other sources, such as friends, significant others, and the community (e.g., sororities and clubs) while others continue to rely on family (Meadows et al., 2006; Renk & Smith, 2007).

**Close Friend Support**

Shifting support away from parents as independence grows is developmentally appropriate and advantageous for gaining autonomy (Erikson, 1950). However, social support from friends is unique because it can be both beneficial and harmful, depending on the situation (Alsubaie et al., 2019; Ciarrochi et al., 2017; Whalen & Lachman, 2000). For example, Lyell and others (2020) found that close friend support was negatively associated with internalizing problems; however, compared to the other sources, it had the weakest association. Other work indicates that close friend support is positively associated with negative outcomes like depression (Arnbeg & Melin, 2016; Ciarrochi et al., 2017; Whalen & Lachman, 2000). One explanation for a positive association between close friend support and depression is that friends may co-engage
in negative behaviors such as rumination (Bastin, et al., 2015; Rueger et al., 2016; Thorsteinsson & Brown, 2008). Regarding gender differences, close friend support is found to be associated with internalizing outcomes in women more than in men (Rueger et al., 2016). The development of intimate relationships outside of parents, however, is an important milestone in young adulthood, specifically relationships with significant others.

**Significant Other Support**

Both men and women are suggested to benefit from significant other support (Bernardon et al., 2011). Being single during young adulthood may be associated with negative outcomes due to the cumulative lack of support perceived from other sources like friends and family. For example, single young adults are suggested to report less support from family than young adults who have a significant other (Adamczyk & Segrin, 2015). In the absence of significant other support, however, single young adults seek support from less intimate sources of support, which could include peer sources from a broader community (Ciarrochi et al., 2017; Rueger et al., 2016).

**Peer Support**

Little work has investigated associations between peers in the community, such as classmates, fellow club members, dorm floormates, sorority sisters/ fraternity brothers, and outcomes outside of academics in college attending young adult samples. Work that has investigated support received from peers, like collegiate level peer-led interventions that assist freshmen students with their transitions to college, have found that the interventions are positively associated with social adjustment among first-year college students (Mattanah et al.,
Gender differences have been found suggesting the negative association between peer social support and symptoms of depression is stronger for women than for men (Guay et al., 2006; Smokowski et al., 2014). Of note, however, current young adults in college have had limited exposure to broad peer support and the broader community due to the pandemic and consequential social and physical restrictions.

**Faculty and Staff Support**

Few studies have investigated the association between faculty social support and symptoms of depression in undergraduate students (Chu et al., 2010). Most work has explored associations between faculty support and academic outcomes. These studies indicate that support from faculty and staff buffer the association between student burnout and academic stress by promoting engagement in effective coping strategies specific to academic stress, such as encouraging students to seek help from tutors and writing centers (Dwyer & Cummings, 2001; Jacobs & Dodd, 2003). The use of coping strategies, such as seeking help from others, is more often observed in women than men (Lazányi, 2017). However, as noted, current college attending young adults may have limited exposure to support from faculty, which may result in low levels of support received from instructors.

**COVID-19 Stress, Depression, and Social Support**

Various models have been proposed to explain the relationships between stress, depression, and social support. As mentioned earlier, the cognitive vulnerability-transactional stress model of depression theorizes that exposure to stress increases vulnerability to developing
depression (Hankin & Abramson, 2001). The stress-reactive rumination model (Robinson & Alloy, 2003) is suggested to moderate the cognitive vulnerability-transactional stress model such that an individual’s tendency to ruminate, the act of perseverative, passive thinking, on negative stressful life events, contributes to the development of stress into depression.

Social support has also been found to mediate the association between stress and depression proposed by the cognitive vulnerability-transactional stress model (Malecki et al., in press; Flynn, Kecmanovic, & Alloy, 2010; Stikkelbroek, et al., 2016). For example, in a longitudinal study, Flynn and colleagues (2010) found that dissatisfaction with social support mediated the association between rumination and interpersonal stress in an undergraduate sample. They also found that rumination and stress within social support relationships predicted depressive symptoms over a nine-month period (Flynn et al., 2010). More recently, results from Malecki and colleagues (2021), found that in older high school students, social support mediated the association between rumination and depressive symptoms during the COVID-19 pandemic. Interestingly, rumination also mediated the association between social support and depressive symptoms.

In addition to growing support of mediating the association between rumination and depression, social support is commonly investigated as a moderator between stress and depression, known as the “stress-buffering” model (Cohen et al., 1985). The model proposes that social support is related to outcomes, such as depression, only in conditions of stress (Auerbach et al., 2011; Burton et al., 2004; Cohen et al., 1985; Coyel et al., 2020). The need for greater social support in conditions of high stress is suggested to stem from individuals relying on social support to help cushion the effects of stress (Rueger et al., 2016). However, individuals experiencing high levels of stress may put forth less effort to engage with their social support
network, which in turn may create greater levels of stress (Dulaney et al., 2018). Thus, support for the “stress-buffering” model is mixed. A growing body of work also suggests that the ability to buffer differs by source of support (Coyle et al., 2020; Rueger et al., 2016). Few studies, however, have investigated the “stress buffering” model in a young adult population, which is a gap the current study aimed to fill. Gender differences in the “stress-buffering” model have been found suggesting that the “stress-buffering” model applies to men but not to women because women are thought to perceive social support more globally than men (Camara et al., 2017; Coyle et al., 2018). The current study explores social support as a buffer (i.e., moderator) of the association between stress and depression and investigates if the moderating effect of social support is stronger for men or women.

The Current Study

Although older adults may be more vulnerable to the physical risk associated with contracting the virus, accumulating research conducted during the COVID-19 pandemic suggests that young adults are at greater risk for developing mental health problems consequential of COVID-19 related stress than older adults (Dozois, 2020; Solomou & Constantinidou, 2020; Ustun, 2020). Stressors that are consequential to the pandemic, such as social isolation, economic burden, and fear of infecting others, are associated with greater symptoms of depression (Brooks et al., 2020; Kira et al., 2020; Taylor et al., 2020).

The current paper aimed to add to the literature that promotes the use of social support as an effective coping strategy during and following disasters (Kickbusch, et al., 2020; Liu et al., 2020; Saltzman et al., 2020; Van Bavel et al., 2020; Zhao et al., 2011). Using a college attending,
young adult sample, the current study explored social support as a network of social support across a variety of sources (i.e., family, close friend/significant other, peers, and faculty/staff) via latent profile analysis. Additionally, differences in stress, depression, and social support by gender, race, and socioeconomic status were analyzed. The main proposal for the current paper was to explore to what extent profiles of sources of social support networks can strengthen or weaken the proposed association between COVID-19-related stress and depression and whether social support was a stronger buffer for women or men in a college-attending, young adult sample. The current study predicted that profiles of social support would moderate the association between COVID-19 related stress, both overall and across different types of stress, and symptoms of depression such that profiles with moderate to high social support from family would buffer against the associations more than other sources (see Figure 1). Finally, the current study predicted that the moderation model would be stronger for men than for women.

Figure 1: Study’s main model
CHAPTER 3

METHODOLOGY

Participants

The current study utilized an undergraduate, college-aged sample from a large, Midwest public university. The total ungraduated enrollment of the university at the start of data collection (August 23, 2020) was 12,277 (US News, 2020). In addition, the US News (2020) reported that 53% of undergrads were female students and 47% were male students. In addition, they reported that only 20% of the undergraduate students lived in college-owned and operated housing while 80% of undergraduate students lived off campus.

Various recruitment methods were implemented including recruitment through undergraduate psychology courses as well as recruitment posts on social media platforms. See Appendix A for recruitment materials. The final sample included $N = 240$, which is approximately 90% of the raw, uncleaned sample. Of the 240 participants, whose ages ranged from 18-26 (76.9% were 18-20 years old), nearly half of the sample were first-year students (50.4%). Additionally, 58.8% of the sample identified as a woman, 37.9% as a man, and 1.7% as gender diverse. The sample was relatively diverse with 47.9% White, 23.4% Black or African
American, 6.7% Asian or Asian American, 4.2% Two or more races, and 17.4% Hispanic/ Latino(a). Also, most of the sample was middle class with 15.3% reporting an annual family income below the poverty line. Further, most of the sample was single (65.8%), and 31.3% in a relationship, 2.1% engaged or married, and 0.4% divorced. Finally, many participants lived at home with family (50.0%), 27.5% living with a roommate on or off campus, 21.4% living alone on or off campus (see Table 1 for demographic breakdown).

The final sample was a result of data cleaned and handling missing data. First, seven cases were removed due to no data following consent question, six cases were removed for stopping after demographic section, one case was removed for quitting after CES, and three cases were removed for missing a CASSS-C subscale. On the CASSS-C, 39 items had one to four missing items across the sample. However, all participants had at least 80% of each subscale, so these missing data were replaced by the mean of the completed items within the subscale from which the item was missing (Malecki, Demary, & Elliot; 2014). Similarly, on the CES-D, 14 items had one to three missing items across all participants. Again, all participants had at least 80% of the scale completed so all missing data were replaced by the computed mean of the completed items on the CES-D (Hann, Winter, & Jacobsen, 1990). Further, five participants had one to three missing items on the COVID-19 related stress subscales. All of these participants had at most 14% of the scales data missing, so these missing data were replaced by the mean of the completed items on the theorized (and later confirmed) subscale (Schafer, 2002; University of Cambridge, MRC Cognition and Brain Sciences Unit, 2009). Finally, five cases who were in their fifth or greater year of undergrad were removed, and four ceases were removed for falling outside of the young adult age (i.e., 18-26).
Table 1

Sample Demographics

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<tr>
<td><strong>Race (n = 239)</strong></td>
<td></td>
</tr>
<tr>
<td>Black or African American</td>
<td>56 (23.4%)</td>
</tr>
<tr>
<td>Asian or Asian American</td>
<td>16 (6.7%)</td>
</tr>
<tr>
<td>Hispanic/ Latino</td>
<td>42 (17.4%)</td>
</tr>
<tr>
<td>White</td>
<td>115 (47.9%)</td>
</tr>
<tr>
<td>Two or more races</td>
<td>10 (4.2%)</td>
</tr>
<tr>
<td><strong>Undergraduate Year (n = 240)</strong></td>
<td></td>
</tr>
<tr>
<td>Freshmen</td>
<td>121 (50.4%)</td>
</tr>
<tr>
<td>Sophomore</td>
<td>50 (20.8%)</td>
</tr>
<tr>
<td>Junior</td>
<td>42 (17.5%)</td>
</tr>
<tr>
<td>Senior</td>
<td>27 (11.3%)</td>
</tr>
<tr>
<td><strong>Gender (n= 236)</strong></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>91 (37.9%)</td>
</tr>
<tr>
<td>Women</td>
<td>141 (58.8%)</td>
</tr>
<tr>
<td>Gender Diverse</td>
<td>4 (1.7%)</td>
</tr>
<tr>
<td><strong>Socioeconomic Status (n = 236)</strong></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>36 (15.0%)</td>
</tr>
<tr>
<td>Middle</td>
<td>132 (55.0%)</td>
</tr>
<tr>
<td>Upper</td>
<td>68 (28.3%)</td>
</tr>
<tr>
<td><strong>Age (n = 238)</strong></td>
<td></td>
</tr>
<tr>
<td>18- 20 years</td>
<td>183 (76.9%)</td>
</tr>
<tr>
<td>21-23 years</td>
<td>40 (16.7%)</td>
</tr>
<tr>
<td>24-26 years</td>
<td>15 (6.3%)</td>
</tr>
<tr>
<td><strong>Relationship Status (n = 239)</strong></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>158 (65.8%)</td>
</tr>
<tr>
<td>In a relationship</td>
<td>75 (31.3%)</td>
</tr>
<tr>
<td>Engaged/ Married</td>
<td>5 (2.1%)</td>
</tr>
<tr>
<td>Divorced</td>
<td>1 (0.4%)</td>
</tr>
<tr>
<td><strong>Living Situation (n = 238)</strong></td>
<td></td>
</tr>
<tr>
<td>At home with family</td>
<td>120 (50.0%)</td>
</tr>
<tr>
<td>On-campus with a roommate(s)</td>
<td>38 (15.8%)</td>
</tr>
<tr>
<td>Off-campus with a roommate(s)</td>
<td>28 (11.7%)</td>
</tr>
<tr>
<td>On-campus without a roommate</td>
<td>45 (18.8%)</td>
</tr>
<tr>
<td>Off-campus without a roommate</td>
<td>6 (2.5%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (0.4%)</td>
</tr>
</tbody>
</table>
Procedure

The study was approved by the Northern Illinois Institutional Review Board. Data were collected during the Fall 2020 (late August- early December) and Spring 2021 (mid-January- early May) semesters. The details that follow provide some context of the university, county, and state circumstances and response to the pandemic.

Background Context

The entire academic year that these data were collected, the university was offering remote only courses. Regarding cases and deaths in the area, according to the Illinois Department of Public Health (IDPH; 2022), on the first day of school this academic year (August 23rd, 2020) the 7-day average number of cases in the county was 2,014 cases. The number of cases stayed relatively similar throughout the first two months until late October 2021. The county saw a spike in COVID-19 cases from late October 2021 until mid-February perhaps due to holiday traveling done by students and locals (IDPH; 2022). There was again a slight increase in cases in late March early April perhaps due to student and faculty traveling for spring break. The daily deaths in the county followed a similar trend (IDPH; 2022). On the first day of school, the 7-day average daily deaths for the county were 19 (IDPH; 2022).

At the state level, the entire state was mandated to wear a mask and remain six feet apart from others (Ballotpedia, 2022). Starting in January, public seating like in restaurants ranged from allowing limited capacity for indoor seating to no indoor seating depending on the county cases. On January 7th, 2021, the governor announced that frontline workers and people 65 years old or older were eligible to receive the vaccine. On February 25th, 2021, peoples 16 or older with high-risk health conditions were eligible to receive the vaccine. The following month on
March 15, 2021, teachers and school staff became eligible to receive the vaccine. Then starting April 12th, people 16 and older were eligible to receive the vaccine (Ballotpedia, 2022). By the time of graduation in May 2021, approximately 70.8 thousand vaccines had been administered in the country (out of approximately 78,930 country citizens above the age of 17; United States Census Bureau, 2022)

The sample was representative of various COVID-19 experiences. Over a quarter of the sample (27.7%) reported being a frontline worker and 61.5% reported having at least one family member or close friend working as a frontline worker. In addition, of those who reported being close to a frontline worker, 80.1% of them reported knowing two people close to them who were frontline workers, 11.7% knowing three, and about 8% knowing 4 or more. Additionally, 9% of the sample reported having a disability that made them more vulnerable to negative side effects of COVID-19 while 36.8% reported having one family member or close friend with a disability, 11.7% with two family members and/or close friends, and 12.1% reporting 3 or more family or close friends with disabilities. Further, at the time of data collection, 77.9% of the participants reported that they had not tested positive with COVID-19. However, 84.7% reported having a family member or close friend test positive at some point (33.3% having a family member or close friend positive for COVID-19 when they were completing the questionnaire). In addition, 32% reported having at least one family member or close friend die from COVID-19. The most commonly report family member to have passed away were aunts/uncles, grandparents, and friends.

All responses were recorded anonymously with no collection of identifiable information (i.e., student ID or name). Participants utilized a link to a survey on Qualtrics to participate in the
study. Participants were recruited from an introductory psychology course. The year these data were collected included a diverse sample of majors enrolled in the course. A survey taken by 1,539 students enrolled in the course both first and second semester indicated that 1.81% of students were enrolled in the College of Visual and Performing Arts, 21.1% in the College of Liberal Arts and Sciences, 18.0% in the College of Health and Human Sciences, 1.7% in the College of Engineering and Engineering Technology, 16.0% in the College of Education, and 31.7% in the College of Business. In addition, 5.1% reported that they had not decided what their major would be and 4.6% left the question blank.

Participants were required to provide informed consent before participating in the study by actively providing electronic consent. Participants who did not consent were redirected to the conclusion of the study and thanked for their time. Participants who did consent were directed to the first page of questions (see Appendix B) for the questions). Following the survey, participants were debriefed on the study (Appendix C), and participants who participated for credit in courses other than PSYC 102 were redirected to a separate Qualtrics survey via a link to provide their name and course they were receiving credit for.

Measures

Measures for the survey included demographic items, the Child and Adolescent Social Support Scale- College Adapted Version (CASSS-C; Fredrick et al., 2021), the Center for Epidemiologic Studies Depression Scale (CES-D; NMIH, 1977), the COVID-19 Traumatic Stress Scale (Kira et al., 2020), and items on academic related stress used in Styck and colleagues’ (2021) COVID-stress study, which were modeled after the COVID-19 Adolescent Symptom & Psychological Experience Questionnaire framework (CASPE; Ladouceur, 2020).
Additional questions were added to inquire if or how participants' daily lives were impacted by COVID-19 (i.e., Did COVID-19 affect your student/employment status? Do/did any of the people listed below have COVID-19? Do/did any of the people listed below have COVID-19? Are any of your family members frontline workers? Are you a frontline worker?). Demographic data were also collected, such as gender, grade level, race, and socioeconomic status. Socioeconomic status was assessed as family income (pre-COVID-19) specific to geographic area these data were collected in as recommended by The American Psychological Association (APA; 2015). The scale began at $26,000 because that is the most recent poverty guideline for a family of four residing in the contiguous states of the United States (ASPE; 2021). The next two income ranges were approximate averages of the upper and lower range of a middle-class family in the state and boarder states of the University where data collection occurred (average state income $65,886 and per capita income $36,038; U.S. Census Bureau. 2019; Sauter, 2020). See Appendix B for all questions included on the survey.

Social Support

Child and adolescent social support scale- college adapted version (CASSS-C; Frederick et al., 2021). The Child Adolescent Social Support Scale- College Adapted Version is a 68-item self-report scale modified by Fredrick and colleagues (2021). Development of the scale is based on the empirically supported Child and Adolescent Social Support Scale (Demaray, Malecki, & Elliott, 2004). The CASSS-C includes four subscales each assessing a different source of support including family, close friend/ significant other, peer/community, and faculty/staff. Each subscales includes 17 items. Following the subscale, participants are asked to answer the following question, “I have at least one close friend or significant other (family member,
peer/community, faculty/staff member) I could go to if I am feeling down, without feeling funny about it later.” Responses are recorded on a 6-point Likert-scale ranging from 1 = Never to 6 = Very Often.

The original Child and Adolescent Social Support Scale (CASSS; Malecki, Demaray, & Elliott, 2004) is a self-report measure of perceived social support for populations of students Grades 3-12. The original CASSS includes 60 items measuring perceived social support across various sources of social support, such as parents, teachers, classmates, close friends, and school. On both the original scale and the recently developed CASSS-C measure, students are given a 6-point Likert-type response scale ranging from 1 = Never to 6 = Very Often to report the frequency that they perceive a variety of supportive behaviors from each source of support. For each source of social support, four types of support are assessed: emotional, informational, instrumental, and appraisal support. Subscale scores on both the original CASSS and the newly developed CASSS-C are calculated by summing across the items on each subscale (e.g., Family, Close Friend/Significant Other, Peers/Community, and Faculty/Staff). Evidence of reliability and validity of the novel CASSS-C were investigated in the current study.

Symptoms of Depression

Center for epidemiologic studies depression scale (CES-D; Randolf, 1977). Symptoms of depression were measured using the Center for Epidemiological Studies-Depression (CES-D; Randloff, 1977) scale. The CES-D is a 20-item measure that asks participants to rate how often over the past week they have experienced symptoms associated with depression, including restless sleep, poor appetite, and feeling lonely. The CES-D was revised in 2004 (CES-D-R; Eaton, Muntaner, Smith,…& Tien, 2004); however, a large number of studies that used the CES-
D to assess symptoms of depression during the pandemic (Chang, Ji, Li,… & Su, 2021; Jassim, Jameel, Brennan,…& Alwatani, 2022; Kaparounaki, Patsali, Mousa,…& Fountoulakis, 2020; Wang et al., 2020) or prior looking at young adults (Ioannou et al., 2019) implemented the original CES-D. In addition, numerous studies assessed depressive symptoms during the pandemic using the shortened versions of the CES-D (e.g., CES-D 10 and CES-D 8), which are also based on the original CES-D (Beller, Regidor, Lostao,… & Geyer, 2020; Horigian, Schmidt, & Feaster, 2021). To stay consistent with the version of the CES-D often used by others during the pandemic, the authors chose to use the original version. Response options range from $0=\text{Rarely or None of the Time}$ to $3=\text{Most or Almost All the Time}$ for each item. Examples of items on the CES-D include, “I felt down and unhappy” and “I was bothered by things that usually don’t bother me.”

The CES-D is scored by summing the items together (after reverse coding items 4, 8, 12, and 16) to get an overall score. Scores range from 0 to 60, with high scores indicating greater depressive symptoms. Although the CES-D can be scored by subscale (i.e., Depressed Affect, Positive Affect, Somatic, and Interpersonal), the current study only looked at the level of depression overall. Scores of 16 or higher indicate reports consistent with clinical depression in a general population (Sensitivity= 0.95, Specificity= 0.29; Randlof, 1977). The measure has demonstrated strong internal consistency in a general population sample ($\alpha=0.85$), and adequate test-retest reliability for the self-report administration (as opposed to the interview administration) ($\alpha=0.51 - 0.67$) in a general population sample. Randlof (1977) also found adequate convergent validity as it moderately correlated to the Hamilton Clinician’s Rating scale and the Raskin Rating scale (.44 to .54; Radloff, 1977).
COVID-19 Related Stress

COVID-19 traumatic stress scale (Kira et al., 2020). Stress consequential of COVID-19 was assessed via 24 self-report questions (see Table 1). Twelve of the questions are from the COVID-19 Traumatic Stress Scale (Kira et al., 2020). On the original 12-item self-report scale, individuals respond to each statement on a 5-point Likert scale ranging from 0 = Not at all to 4 = Extremely. However, for the current study, participants responded to each item on a scale ranging from 1 = Not at all to 5 = A great deal, which is consistent with the CASPE.

The COVID-19 Traumatic Stress Scale consists of three dimensions: “threat/fear of infection and death,” “economic hardship,” and “disturbed routines/isolation. The overall scale demonstrated strong internal consistency $\alpha = .88$. Additionally, alphas for the subscales of future infection/death subscale, economic trauma, and routine disturbances were .84, .75, and .70 respectively. The measure demonstrated strong convergent and predictive validity as seen through high correlations with general anxiety, death anxiety, and PTSD.

Modified COVID-19 adolescent symptom & psychological experience questionnaire (CASPE; Ladouceur, 2020). The last twelve (i.e., half) questions assessing COVID-19 were loosely based on the COVID-19 Adolescent Symptom & Psychological Experience Questionnaire (CASPE; Ladouceur, 2020). Participants completed one multipart question from the CASPE (see Table 1; Ladouceur, 2020). The CASPE includes 42 items that assess experiences related to the general, the emotional, the cognitive, and the social events consequential of COVID-19 and resulting restrictions to daily life. The multipart question completed by participants from the CASPE related stress associated with COVID-19 (i.e., “How
stressful have these things been?”). The current study only utilized one multipart item assessing stress related to COVID-19.

Prior exploratory factor analysis on the CASPE stress items indicated that inter-item correlations were explained by three to four common factors across elementary, middle school, and high school grades (Styck et al., 2020): (1) Social Isolation; (2) Fear of COVID-19 Illness; (3) Schoolwork Stress; and (4) Missing Events. The current study, however, diverged from prior use of these tools in two ways. First, the current study adapted the included items to be more representative of collegiate education experience over the course of the pandemic. Items that delineate from the items previously used included the same statement but different examples that were more tailored to college aged populations. For instance, one of Styck and others’ (2020) items stated, “Missing events that were important to me (e.g., dances, graduation),” and the study’s item stated, “I have missed events that were important to me (e.g., Greek life rush, orientation).”

The current study also modified the response options of the included items to converge with the structure of the COVID-19 Traumatic Stress Scale (see Table 2). For example, the original CASPE included 16 items with instructions that read, “In the past 7 days, including today, what has been your level of concern about the impact of the COVID-19 outbreak about the following.” The revised instructions maintained the instructions from the COVID-19 Traumatic Stress Scale, which stated: “The following are a set of statements and questions about Coronavirus (COVID-19) impacts. Please rate/answer each statement/question” The current study used the 5-point Likert scale ranging from 1 = Not at all to 5 = A great deal, which is consistent with the CASPE framework. Evidence of reliability and validity of COVID-19-related stress items used in the current study were investigated and reported in the results section. The
choice to use the presented measures to measure the impact of the COVID-19 pandemic was deemed appropriate due to the lack of empirically validated field-based tools, particularly tools that assess how the virus has changed academic experiences at the collegiate level.

Predictions and Data Analyses

Preliminary Analyses

All preliminary analyses were conducted in SPSS (IBM Corporation, 2020). Several descriptive analyses were run to examine the study’s primary variables. For example, the current study predicted that a wide range of depression levels would be reported by the current sample with more of the sample reporting moderate to high levels of depressive symptoms than those reporting few symptoms of depression. This prediction was supported by literature collected during the pandemic suggesting that young adults are experiencing elevated levels of depression (Ettman et al., 2020; Solomou & Constantinidou, 2020). Additionally, correlations between the study’s main variables were conducted. Differences between demographic groups (i.e. race, socioeconomic status, grade level) of the key variables were assessed. The study also analyzed if there are differences between students who live at home and those who do not. The psychometric properties of the Child and Adolescent Social Support Scale- College Version were explored. Exploratory factor analyses (EFA’s) were conducted in SPSS (IBM, 2020) to confirm the proposed structure of the CASSS-C. The study predicted that CASSS-C would indicate four distinct subscales including Family, Close Friend/ Significant Other, Peer/Community, and Faculty/ Staff. The current project predicted that the reliability coefficients would have adequate power.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Item</th>
<th>Predicted Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COVID-19</strong></td>
<td>1. I am afraid of the coronavirus (COVID-19).</td>
<td>Fear of COVID-19 Illness</td>
</tr>
<tr>
<td>Traumatic Stress Scale</td>
<td>2. I am stressed around other people because I worry I’ll catch the coronavirus (COVID-19)</td>
<td>Fear of COVID-19 Illness</td>
</tr>
<tr>
<td></td>
<td>3. Thinking about the coronavirus (COVID-19) makes me feel threatened.</td>
<td>Fear of COVID-19 Illness</td>
</tr>
<tr>
<td></td>
<td>4. How concerned are you that you’ll be infected with the coronavirus (COVID-19)?</td>
<td>Fear of COVID-19 Illness</td>
</tr>
<tr>
<td></td>
<td>5. Over the past two weeks, I have felt nervous and fearful about the future because of the coronavirus (COVID-19).</td>
<td>Fear of COVID-19 Illness</td>
</tr>
<tr>
<td></td>
<td>6. The coronavirus (COVID-19) has impacted me negatively from a financial point of view.</td>
<td>Economic Hardship</td>
</tr>
<tr>
<td></td>
<td>7. I have lost a job, or related income, due to the coronavirus (COVID-19)</td>
<td>Economic Hardship</td>
</tr>
<tr>
<td></td>
<td>8. I have had a hard time getting needed resources (i.e., food) due to the coronavirus (COVID-19)</td>
<td>Economic Hardship</td>
</tr>
<tr>
<td></td>
<td>9. It has been difficult for me to get the things I need due to the coronavirus (COVID-19).</td>
<td>Economic Hardship</td>
</tr>
<tr>
<td></td>
<td>10. Over the past two weeks, I have felt socially isolated as a result of the coronavirus (COVID-19).</td>
<td>Social Isolation</td>
</tr>
<tr>
<td></td>
<td>11. Over the past two weeks, my life routines have been affected by the coronavirus (COVID-19) situation.</td>
<td>Social Isolation</td>
</tr>
<tr>
<td></td>
<td>12. What is the extent to which sheltering in place has negatively affected your relationship with others?</td>
<td>Social Isolation</td>
</tr>
<tr>
<td></td>
<td>13. I am stressed about falling behind on schoolwork.</td>
<td>Academic Stress</td>
</tr>
<tr>
<td>COVID-19 Adolescent Symptom &amp; Psychological Experience Questionnaire (CASPE)</td>
<td>14. I am worried that my family might get sick.</td>
<td>Fear of COVID-19 Illness</td>
</tr>
<tr>
<td></td>
<td>15. It has been difficult not seeing friends in person.</td>
<td>Social Isolation</td>
</tr>
<tr>
<td></td>
<td>16. I am worried that my friends might get sick.</td>
<td>Fear of COVID-19 Illness</td>
</tr>
<tr>
<td></td>
<td>17. I have missed events that were important to me (e.g. Greek life rush, orientation). *</td>
<td>Missing Events</td>
</tr>
</tbody>
</table>

(Continued on next page)
(Table 2 continued)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Item</th>
<th>Predicted Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Items from Styck et al’s (2020) Scale</td>
<td>18. I am concerned about increased family conflict.</td>
<td>Social Isolation</td>
</tr>
<tr>
<td></td>
<td>19. I have had a hard time concentrating on schoolwork.</td>
<td>Academic Stress</td>
</tr>
<tr>
<td></td>
<td>20. I have missed school events, activities, and sports (e.g., clubs, sports).</td>
<td>Missing Events</td>
</tr>
<tr>
<td></td>
<td>21. I have had a hard time getting a job.</td>
<td>Economic Hardship</td>
</tr>
<tr>
<td></td>
<td>22. I have had a hard time being motivated to do schoolwork.</td>
<td>Academic Stress</td>
</tr>
<tr>
<td></td>
<td>23. I have missed going to community events (e.g., church, festivals)</td>
<td>Missing Events</td>
</tr>
<tr>
<td></td>
<td>24. I have missed other non-school social activities (e.g., concerts, social outings) *</td>
<td>Missing Events</td>
</tr>
</tbody>
</table>

Note: Responses were recorded on the following scale: 1 = Not at all, 2 = A little, 3 = A moderate amount, 4 = A lot, and 5 = A great deal; * Indicates that the examples provided were adapted for a collegiate-age sample.
Question 1: What stressors associated with the COVID-19 emerge in a young adult population in college in the pandemic situation? Do these stressors differ by gender?

The current study included, developed and modified various questions to assess COVID-19 related stress across various domains including Fear of COVID-19 Illness, Economic Hardship, Social Isolation, Missing Events, and Academic Stress. It was expected that these stressors would emerge in an exploratory factor analysis. Exploratory factor analyses (EFA’s) were conducted in SPSS (IBM, 2020) to explore the proposed structure of the COVID-19 related stress measure. The current project predicted that the reliability coefficients would be adequate. The study also explored if men and women would report experiencing different types of COVID-19 stressors. It was predicted that students who identify as a woman would report greater stress overall and across all types of COVID-19 related stress than students who identify as male, which was backed by recent work conducted during the pandemic suggesting women report more stress than men (Barzilay et al., 2020). To test gender differences, a multivariate analysis of variance (MANOVA) on the mean COVID-19 stress scores of each subscale (i.e., dependent variable) by gender (i.e., independent variable) was conducted in SPSS.

1.1: What levels of social support, from various sources, do young adults in college report receiving? Does support from these sources differ gender? It was predicted that the whole current sample would report receiving some level of support from all sources but would report perceiving more support from families and close friends/ significant others than from peers/community and faculty/staff. The prediction that college attending young adults would report high levels of support from close friends/ significant others stemmed from the well
documented shift in social support away from families to friends that begins in adolescence and continues into adulthood (Rueger et al., 2016). However, the current study also predicted that participants would report perceiving family support because of COVID-19 related restrictions, which has kept many families closer in proximity due to many young adults moving home. To test this, a repeated measures analysis of variance (RMANOVA) was conducted using SPSS to compare the reports of social support across multiple sources.

Additionally, the current study predicted that students who identified as a woman would report perceiving more social support than those who identified as a man. This prediction was based on prior work that suggested women view social support more globally and are more likely to seek social support from others than men (Lazányi, 2017; Rueger et al., 2016). A multivariate analysis of variance (MANOVA) was conducted to look at differences in social support (i.e., Family support, Close Friend/Significant Other Support; Peer/Community support, Faculty/Staff support; dependent variables) from various sources by gender (i.e., independent variable).

Question 2: What levels of depression are reported by a college-attending young adult sample in the pandemic situation? Do these reports differ by gender?

The study predicted that students who identified as a woman would report higher levels of depression than students who identified as a man, which is well documented in the literature (McGinty et al., 2020; Notivol et al., 2020; Patil et al., 2018). Differences in depression (i.e.,
dependent variable) by gender (i.e., male and female; independent variable) was assessed using a t-test.

Question 3: How are college attending young adults’ perceived COVID-19 related stress associated with reports of symptoms of depression in the pandemic situation? What types of COVID-19 related stressors are unique, independent predictors of symptoms of depression in the pandemic situation?

It was predicted that reports of stress would be positively associated with reports of depressive symptoms, which is a finding that was well established in prior work and encompassed in the stress- vulnerability model (Camara et al., 2017; Cohen et al., 1989; Coyle et al., 2018; Rueger et al., 2016). That is, more stress would be associated with greater reports of symptoms of depression. Further, it was predicted that stressors related to lifestyle changes, such as social isolation and economic hardship, would be unique individual predictors of symptoms of depression. This prediction was based on past work that indicates lifestyle changes to be more predictive of depressive symptoms during and after disasters than stressors directly related to the disaster itself (Cerda et al., 2013; Norris et al., 2008; Tracy et al., 2011). To test this, multiple regressions were conducted to assess how perceived COVID-19 related stress from various stressors (i.e., Economic Hardship, Social Isolation; Academic Stress, Missing Events, Fear of COVID-19 Illness; independent variables) are associated with reports of depressive symptoms (dependent variable).
Question 3.1: Does gender moderate the association between COVID-19 related stress and depression in the pandemic situation? It was predicted that gender would moderate the association between COVID-19 related stress and depression. More specifically, the current study predicted that the association between COVID-19 related stress and depression would be stronger for women than men. This prediction stemmed from research on the cognitive-vulnerability stress model, which largely indicated that the association between stress and depression is stronger for women than men (Calvete, Orue, Hankin, 2013; Mezulis et al., 2010). To test gender as a moderator, the current study used Hayes’s PROCESS macro (v. 3.1; Hayes, 2017) for SPSS (IBM, v. 22) to test moderation, which automatically implements a dummy coding to analyze contrasts (Fairchild & McQuillin, 2010). Before analyzing moderation, assumptions related to the residuals, distribution, linearity, homoscedasticity, and collinearity were assessed. The current study determined that no skewed normality of residuals was present. Thus, they did not need to be corrected using log-transformations. Significant results would be plotted for interpretation. COVID-19 related stress scores were mean centered and gender was specified as a factor, which were both independent variables. Depression was the independent variable and significant results were to be plotted in PROCESS for interpretation. Conditional effects were assessed within process using a regression-based conditional process analysis approach as recommended by Hayes (2013).
Question 4: What profiles of perceptions of social support emerge for young adults across the four sources of support in the pandemic situation?

It was predicted that various profiles of social support would emerge, including profiles of high, average, and low support (Bovier et al., 2004; Demaray & Malecki, 2002). Of more interest, however, it was predicted that profiles with mixed amounts of support across sources (i.e. high family and faculty support with low close friend/ significant other, and peer/community and support and vice versa) would emerge as well (Kelly & Malecki, 2021). To create the proposed profiles of social support, the statistical method of latent profile analysis (LPA) was run using the statistical program Mplus Version 7 (Muthén & Muthén, 2007). LPA is a person-centered statistical procedure that classifies individuals into subgroups based on their patterns of responses to sets of both continuous and categorical data (Gibson, 1959). LPA models create categorical latent variables, or profiles, to explain associations in continuous observed indicators (i.e., depressive symptoms). The goal of LPA is to both identify different subgroups whose members are similar to each other and to emphasize differences of one group membership to another. One way to define profile membership is by observable indicators including typespecific mean-centered scores of the CASSS-C subscales. Further, individuals are assigned to profiles based on their pattern of scores on the observed indicators (i.e., CASSS-C subscales including Family, Close Friend/ Significant Other, Peer/Community, and Faculty/ Staff).

The emerged profiles in LPA analyses must meet multiple criteria to ensure the determined model was a good fit, including the Bayesian information criterion (BIC), Akaike’s information criterion (AIC), Consistent Akaike’s information criterion (CAIC), and the log likelihood. These criteria models are used to prevent too many profiles from emerging.
Indicators are deemed a good model fit if they include lower AIC, CAIC, and BIC values than the log likelihood values. These values are obtained from the Bootstrapping method (Nylund et al., 2007). Nylund and colleagues (2007) proposed that it is essential that profile selection is consistent with the degree of congruence between the classes and the empirical support for the model in addition to the statistical fit indicators. Thus, of equal importance to the analysis, the theoretical meaningfulness of classes that emerges was also considered before identifying the final model.

**Question 5:** Does social support profile membership moderate the association between COVID-19 related stress and symptoms of depression in the pandemic situation, and, if so, which profiles are significant moderators of the association between COVID-19 related stress and symptoms of depression?

The current study predicted that social support profile membership would moderate the association between COVID-19 related stress and symptoms of depression. A growing body of work supported the stress-buffering model, which proposed that social support is indirectly related to various outcomes, such as depression, in conditions of stress (Auerbach et al., 2011; Burton et al., 2004; Cohen et al., 1985; Coyle et al., 2020). More specifically, the study predicted that profiles with moderate to high levels of family support would buffer the association between COVID-19 related stress and symptoms of depression more strongly than profiles that had low levels of family support. These predictions stemmed from studies that indicated that low levels of family support are associated with greater reports of depressive symptomatology than
moderate or high levels and that family support may compensate for a lack of support from other sources like peers (Coyle et al., 2018). However, accumulating evidence suggests that a lack of family support may not be compensated for by others (Ciarrochi et al., 2017; Coyle et al., 2018; Lee et al., 2018; Lyell et al., 2020; Smokowski et al., 2014).

To test whether social support profiles moderated the association between different types of stress and depression, a test of moderation in Hayes’s PROCESS for SPSS was conducted with a COVID-19 related stressor as the independent variable, depression as the dependent variable, and social support profiles as a dummy-coded categorical moderator (pending number of profiles; Hayes, 2013). Before analyzing moderation, the same assumptions outlined in Question 3 were met. Again, significant results would be plotted for interpretation. In all five tests of moderation were conducted with the type of COVID-19 related stressor (i.e., Fear of the COVID-19 Illness, Economic Hardship, Academic Stress, Social Isolation, and Missing Events) as the independent variable, reports of depressive symptoms as the dependent variable, and social support profiles as the moderator.

It was predicted that social support profiles would be a significant moderator in all five associations, which was based on literature indicating that social support serves as a protective factor against many types of stress perhaps due to the various types of support (e.g., emotional, instructional, instrumental) that individuals can receive from various sources (Malecki & Demaray, 2003; Östberg, & Lennartsson, 2007). Specifically, the current study predicted that profiles with moderate to high levels of support from family and close friends/significant others would more strongly buffer against the association between COVID-19 related stress overall, as
well as specific stressors, and depression (Alsubaie et al., 2019; Rueger et al., 2016; Saltzman et al., 2020). Differential strength (i.e., conditional effects) in moderation between the profiles would be analyzed using the “contrast” function in PROCESS, which implements dummy coding to test the difference of different conditions (i.e., profiles) of the independent variable (i.e., COVID-19 related stress), if significant results were found. For example, the study would have conducted a test of the difference in the conditional effect of Fear of the Virus on depression between one profile and another profiles.

**Question 5.1: Does gender moderate the predicted moderating effect of social support profile membership on the association between COVID-19 related stress and symptoms of depression in the pandemic situation?** The current study predicted that gender would be a significant moderator to the moderation of social support profiles to the association between COVID-19 related stress and symptoms of depression. Specifically, was predicted that the model would be more strongly associated with identifying as a man than as a woman. This prediction was based on research that indicated although women appear to benefit more generally from social support, men benefit more from social support in conditions of high stress (Coyle et al., 2018; Demaray & Malecki, 2002; Rueger et al., 2016).

To test this question, a conditional process analysis of a three-way interaction was conducted (Hayes, 2013). These analyses were performed using Hayes’s PROCESS macro (v. 3.1; Hayes, 2017) for SPSS (IBM, v. 22). Significant results would be plotted for interpretation and conditional effects and would be analyzed such as the difference between two conditional
effects (i.e. profile and gender) of the independent variable (COVID-19 related stress).

Conditional effects of various combinations of gender and profiles, including within and between profile differences (e.g., women from profile 1 to men of profile 1 or women in profile 1 to women in profile 3) would be explored.
CHAPTER 4

RESULTS

Preliminary Results

Various preliminary results were explored. First, the means and standard deviations of the study’s key variables in this sample were tested. Specific means and standard deviations can be found in Table 3. In all, the study’s key variables were all strongly correlated in the expected direction. For specific correlations and standard deviations refer to Table 4 for correlations.

CASSS-C EFA

The newly developed CASSS-C was analyzed using exploratory factor analysis (EFA) with oblimin rotation. A sample of 249 young adult, undergraduate students was used for the analyses, which were done before missing data were handled. The initial EFA analysis indicated five factors according to both the scree plot and eigenvalues, explaining a total of 79.05% of the variance for the entire set of variables. However, factor 5 included only one item, “Peers I spend time with treat me nicely,” which was cross-loaded with a factor that included all peer subscale items, as predicted. A second EFA was run using a dataset that had removed missing cases and replaced missing items with mean computed scores. This EFA (N = 246) constrained the model to
four factors and resulted in the four subscales proposed by source: Family Support, Close Friend Significant Other Support, Peer Support and Faculty Support. The final EFA’s eigenvalues ranged from 5.39 - 29.85 and cumulatively explained 76.67% of the observed variance in scores. The CASSS-C EFA indicated a KMO score of .951, which strongly supports that the factor analysis is useful with the current sample.

Table 3
Means and Standard deviations of Key Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Response Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COVID-19 Related Stress</strong></td>
<td></td>
<td></td>
<td>1 to 5</td>
</tr>
<tr>
<td>Fear of Virus ( (n=239) )</td>
<td>2.40</td>
<td>0.94</td>
<td></td>
</tr>
<tr>
<td>Economic Hardship ( (n=240) )</td>
<td>1.89</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td>Social Isolation ( (n=240) )</td>
<td>2.39</td>
<td>1.20</td>
<td></td>
</tr>
<tr>
<td>Missing Events ( (n=240) )</td>
<td>3.12</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>Academic Stress ( (n=240) )</td>
<td>3.24</td>
<td>1.28</td>
<td></td>
</tr>
<tr>
<td><strong>Social Support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family ( (n=240) )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close Friend/ Significant</td>
<td>4.51</td>
<td>1.21</td>
<td>1 to 6</td>
</tr>
<tr>
<td>Other ( (n=240) )</td>
<td>4.84</td>
<td>1.07</td>
<td></td>
</tr>
<tr>
<td>Peer/ Community ( (n=240) )</td>
<td>4.39</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>Faculty/ Staff ( (n=240) )</td>
<td>4.28</td>
<td>1.24</td>
<td></td>
</tr>
<tr>
<td><strong>Depression</strong> ( * (n=240) )</td>
<td>19.62</td>
<td>11.31</td>
<td>0 to 60</td>
</tr>
</tbody>
</table>

\*A score of 16+ is considered depressed. Response options for the social support scale were 1 = Never; 2 = Almost Never; 3 = Some of the Time; 4 = Most of the Time; 5 = Almost Always; 6 = Always. Response options for the COVID-19 related stress scales were 1 = Not at all; 2 = A little; 3 = A moderate amount; 4 = A lot; 5 = A great deal.

Additionally, the Bartlett test was significant \( p < .001 \), which supports the emerged factors and indicates that the emerged factors are related. Results from the EFA supported the predicted item factor loadings across four subscales by source of support. Cronbach’s alphas for the subscales were strong including Family (.978), Close Friend/Significant Other (.980), Peer/Community (.978), and Faculty/Staff (.981).
Differences in Race and SES. A two-way MANOVA investigated differences in social support across various sources by Race and SES. Due to small cell sizes, racial groups that had a small sample such as Asian/ Asian Americans and Two or More Races were removed for the two-way MANOVA preliminary analyses. Thus, only differences between individuals who identified as White, Black/African American/ and Hispanic/Latino(a) were assessed \((n = 220)\). The analyses grouped participants who reported household incomes between $26,000- $99,999 into one SES group along with grouping household incomes of $100,000 and higher. The three SES groups will be referred to as “Lower Income,” “Middle Income,” and “Higher Income.”

Looking at differences by Race, the analyses did not identify a significant multivariate main effect of social support, Wilks Lambda \(\lambda = .973, F (8, 398) = 0.686, p = .708\). Similarly, there was not a significant multivariate main effect of SES on social support, Wilks Lambda \(\lambda = 0.968, F (8, 398) = 0.809, p = .595\). There was also no significant race by SES interaction on social support, Wilks Lambda \(\lambda = 0.926, F (16, 608) = 0.965, p = 0.499\).

Differences by Age, Grade Level, and Living Situation. A MANOVA looking at Social Support across ages, indicated that there were not significant differences in Social Support by Age Wilks Lambda \(\lambda= .945 F (8, 466) = 1.670, p = .103\). Similarly, no significant differences in social support by living situation across the specific sources of support were indicated Wilks Lambda \(\lambda=.949, F (20, 760) = 0.603, p = .912\). Further, no significant differences in social support by grade level were indicated Wilks Lambda \(\lambda=.931, F (12, 616) = 1.412, p = .155\).
Question 1: What stressors associated with COVID-19 emerge in a young adult population in college in the pandemic situation? Do these stressors differ by gender?

Twenty-four questions relating to COVID-19 related stress were factor analyzed using exploratory factor analysis (EFA) with oblimin rotation. A sample of 249 young adult, undergraduate students was used for the analyses, which were done before missing data were handled. The initial EFA analysis indicated five factors on both the scree plot and eigenvalues, explaining a total of 68.57% of the variance for the entire set of variables. Eigenvalues ranged from 1.237- 9.161. To test the validity of the emerged factors, Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett’s test of sphericity were conducted. KMO is a statistic that indicates the proportion of variance in your variables that might be caused by underlying factors. High values (close to 1.0) generally indicate that a factor analysis may be useful with your data. The COVID-19 related stress EFA indicated a KMO score of .910, which strongly supports that the factor analysis is useful with the current sample. Additionally, the Bartlett test was significant ($p = .000$), which supports the emerged factors and indicates that the emerged factors are related. Results from the initial EFA largely supported the predicted item factor loadings across five subscales and supported the use of an overall stress score. However, using a 0.6 loading value, two cross factor loadings were indicated including item 5, “I have felt nervous and fearful about the future because of the coronavirus (COVID-19),” which loaded with one factor that suggested fear of the physical threat of the virus and one factor that encompassed stress related to social isolation.
Table 4
Correlations

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fear of the Virus</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Economic Hardship</td>
<td>.516**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Social Isolation</td>
<td>.464**</td>
<td>.581**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Missing Events</td>
<td>.366**</td>
<td>.358**</td>
<td>.483**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Academic Stress</td>
<td>.375**</td>
<td>.480**</td>
<td>.506**</td>
<td>.515**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Family Support</td>
<td>-.098</td>
<td>-.290**</td>
<td>-.235**</td>
<td>-.028</td>
<td>-.181**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Peer/ Community Support</td>
<td>-.015</td>
<td>-.009</td>
<td>-.086</td>
<td>-.120</td>
<td>-.021</td>
<td>.453**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Faculty Support</td>
<td>.016</td>
<td>-.130*</td>
<td>-.139*</td>
<td>-.118</td>
<td>-.206**</td>
<td>.459**</td>
<td>.429**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Close Friend/ Sig. Other</td>
<td>.025</td>
<td>-.039</td>
<td>-.039</td>
<td>.084</td>
<td>-.086</td>
<td>.449**</td>
<td>.583**</td>
<td>.388**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Depression</td>
<td>.333**</td>
<td>.462**</td>
<td>.543**</td>
<td>.326**</td>
<td>.570**</td>
<td>-.358**</td>
<td>-.224**</td>
<td>-.304**</td>
<td>-.124</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>11. Overall Stress</td>
<td>.689**</td>
<td>.745**</td>
<td>.810**</td>
<td>.740**</td>
<td>.786**</td>
<td>-.217**</td>
<td>-.014</td>
<td>-.160*</td>
<td>-.039</td>
<td>.599**</td>
<td>--</td>
</tr>
</tbody>
</table>
Due to the cross loading and the lack of strong theoretical support for the item to be included in one factor over the other, this item was removed from the analyses. The second item (i.e., item 15) that was cross-loaded was, “It has been difficult not seeing friends in person,” which was loaded with a factor that assessed stress related to missing events and a factor assessing stress related to social isolation. Two additional EFAs were conducted with one including item 15 and one not. The amount of variance explained by the Missing Events, Social Isolation, or overall variance did not significantly differ when the item was removed from the analysis. Thus, 15 was also removed for the final model. The final EFA model included 22 items that, again, indicated five factors by both the scree plot and eigenvalues, explaining a total of 69.53% of the variance for the entire set of variables. Eigenvalues ranged from 1.15- 8.37 with a KMO score of .90. Additionally, the Bartlett test was significant ($p < .001$). Refer to the table in the Appendix for detailed factor loadings of the final model.

Factor 1, which included six items, was labeled Fear of the COVID-19 Illness due to the high loadings from items that assessed stress related to the physical threat of the virus such as, “I am stressed around other people because I am concerned I will catch the corona virus (COVID-19)”. This first factor explained 38.03% of the variance. The second factor included six items and encompassed items related to Economic Hardship, such as “I have lost a job or related income to the coronavirus (COVID-19)”. The variance explained by this factor was 11.56%. Factor 3 included three items assessing Social Isolation, such as “I have felt socially isolated as a result of the coronavirus (COVID-19)”. Factor 3 explained 5.26% of the variance. Next, factor 4 included four items related to Missing Events like “I have missed going to non-school related social activities (e.g., concerts or social gatherings)”. Factor 4 explained 5.77% of the variance.
Finally, factor 5 included three items that assessed Academic Stress like “I am stressed about falling behind on schoolwork”. Factor 5 explained 8.90% of the variance. The reliability coefficients for the emerged factors after controlling for missing data were as follows: Fear of COVID-19 Illness (.902), Economic Hardship (.828), Social Isolation (.856), Missing Events (.829), and Academic Stress (.907).

**Differences in Gender, Race and SES**

An MANOVA looking at gender differences across stress was run. Gender differences in COVID-19 related stress were found, $\lambda = .927, F (5, 225) = 3.567, p = .004$. Significant gender differences were found for Fear of Virus ($p < .001$), Economic Hardship ($p = .005$), and Academic Stress ($p = .009$), and overall stress ($p = .001$) such that women reported more stress than men. Further, a two-way MANOVA investigated differences in COVID-19 related stressors by Race and SES was conducted using the sample utilized in the preliminary race by SES analyses. Looking at differences by Race, the analysis identified there was not a significant multivariate main effect, $\lambda = .923, F (10, 394) = 1.604, p = .103$. Further, there was not a significant multivariate main effect of SES, $\lambda = 0.919, F (10, 394) = 1.700, p = .079$. There was also no significant association by Race by SES interaction, $\lambda = 0.902, F (20, 655) = 1.038, p = 0.414$.

**Differences by Living Situation**

A MANOVA was conducted investigating COVID-19 related stressors and by Living Situation (i.e., At home with family; On-campus with a roommate(s); Off-campus with a roommate(s); On-campus without a roommate; Off-campus without a roommate; Other) was
conducted. Looking at COVID-19 related stressors, a MANOVA was conducted and indicated significant differences in COVID-19 related stress by Living Situation $\lambda = .823, F(25, 844) = 1.760, p = .012$. Specifically, significant main effects by Living Situation included associations with both Fear of the Virus $F(5, 226) = 2.528, p = .030$. Post hoc analyses indicated that students who lived at home reported significantly more stress related to Fear of the Virus than students who lived with a roommate(s) on campus ($p = .029$). There were not significant differences in Economic Hardship ($F(5, 198) = 1.716, p = .132$), Social Isolation ($F(5, 198) = 7.406, p = .338$), Missing Events ($F(5, 198) = 9.676, p = .221$), or Academic Stress ($F(5, 198) = 0.967, p = .438$) by living situation, however.

**Differences by Age and Grade Level**

Looking at COVID-19 related stressors, a MANOVA was conducted and indicated that there were significant differences in COVID-19 related stress by Age $\lambda = .914, F(10, 444) = 2.042, p = .028$. Specifically, significant main effects by Age indicated a significant mean difference between Ages within Economic Hardship such that older students reported more Economic Hardship $F(2, 226) = 3.160, p = .044$. A MANOVA investigating COVID-19 related stressors by Grade Level was also conducted. Looking at COVID-19 related stressors, a MANOVA indicated there were significant differences in COVID-19 related stress by Grade Level $\lambda = .883, F(15, 613) = 1.878, p = .023$. Specifically, significant main effects by Grade Level included significant mean differences by Grade Level on Economic Hardship $F(3, 226) = 3.072, p = .029$ as well as Fear of the Virus $F(3, 226) = 4.609, p = .004$, such that older grades reported greater stress in these areas. Post hoc comparisons indicated that Seniors reported
significantly more stress than Freshman in the areas of Fear of the Virus stress \((p = 0.010)\) and Economic Hardship \((p = 0.035)\). Surprisingly, the study did not find significant differences in Academic Stress between lower and upper grade levels, because prior work conducted before the pandemic indicates that typically, academic stress increases as students move up grade levels (Rasheed, Naqvi, Ahmad, & Ahmad, 2017). Work conducted before the pandemic also indicated that women typically report more academic stress than men; however, both historically have reported, on average, mild to moderate levels of academic stress (Jácquez, 2016; Stevens, Schneider, Bederman-Miller, & Arcangelo, 2019).

Question 1.1: What levels of social support, from various sources, do young adults in college report receiving in the pandemic situation? Does support from these sources differ by gender?

A RMANOVA was conducted to assess the differences among the sources of social support. The results of the test indicated that there were significant differences in levels of social support between the sources of social support, \(\lambda = .784, F (3, 237) = 21.708, p = .000\) (see Table 1). Pairwise comparisons revealed that the sample reported significantly more support from family than from faculty \((p = .029)\); however, they reported significantly less social support from family than close friends/ significant others \((p < .001)\). Additionally, results indicated that young adults on average reported significantly more support from close friends/significant others than from both peers \((p < .001)\) and faculty \((p < .001)\). There were no significant differences, however, between faculty and peer support \((p = 1.000)\) or between family and peer support \((p = .697)\). Further, a MANOVA revealed that there were not, however, differences in levels of social support from various sources by gender \(\lambda = .968 F (4, 227) = 1.869, p = .117\). In all, these levels of social support across sources are consistent with other studies looking at social support during
the pandemic (Abuhamdah et al., 2021). Specifically, Abuhamdah and colleagues (2021) found similar levels of social support from significant others, family, and close friends in an undergraduate sample and found that students over the age of 30 reported more support than those under the age of 30. In all, they found that most of the sample reported having a moderate level of support. Few current studies conducted before the pandemic looked specifically at levels of social support in undergraduate students, but studies that did look at social support less recently found that women tended to report more social support than men (Grubber, 2008; Rayle & Chung, 2009), students who identified as White reported more support than minority students (Hefner & Eisenburg, 2009), and more support was received from family and close friends than peers (Hefner & Eisenburg, 2009).

Question 2: What levels of depression are reported by a college-attending young adult sample in the pandemic situation? Do these reports differ by gender, race, or SES status?

A score of 16 or higher on the CES-D indicates a risk of clinical depression. The sample’s overall mean was 19.619. Traditionally, the cut-off score on the CES-D for being considered at-risk for clinical depression is 16. In the current sample, approximately 66% of the participants received a score of 16 or higher. More recent studies, however, have suggested that a cut-off score of 21 may be more valid screening indicator (Henry, Grant, & Cropsey, 2018), which approximately 57% of the current sample met or exceeded. Using an independent samples T-Test, significant differences in depression by gender were found such that women ($M = 21.58$, $SD = 12.00$) reported more symptoms of depression than men ($M = 16.37$, $SD = 9.09$) with $t (230) = -3.540$, $p = .001$. There were not, however, significant differences in reports of depressive symptoms by either race $F (2, 210) = 0.139$, $p = .870$, SES $F (2, 210) = 1.485$, $p = .229$, or the
interaction of SES and race $F(4, 210) = 1.420, p = .228$. These rates of depression were slightly higher than the rates of depression found in undergraduate samples prior to the pandemic, which were about 33% in 2016 (Alsubaie, Stein, Webster & Waldman, 2019) and 34% in 2017 (Lipson, Lattie, & Eisenburg, 2019). Relatedly, a study published in 2012 by Mistler et al. found that across 400 college counseling centers throughout the United States, Canada, much of Europe, the Middle East, Asian and Australia, 41.6% of college students who sought psychological services with anxiety-related concerns, which is been found to be a precursor or comorbid with depression.

Question 3: How are college attending young adults’ perceived COVID-19 related stress associated with reports of symptoms of depression in the pandemic situation? What types of COVID-19 related stressors are unique, independent predictors of symptoms of depression in the pandemic situation?

Using a multiple regression, the overall linear model was significant $F(5, 233) = 34.213, p < .001$ indicating that the combination of all types of COVID-19 related stressors significantly and positively predicted symptoms of depression. That is, greater stress was associated with more symptoms of depression. Further, the overall model explained 42.3% of the variance in reports of depressive symptoms ($R^2 = .423$). Two specific types of stressors emerged as unique individual predictors of symptoms of depression including Social Isolation ($p < .000$) and Academic Stress ($p < .000$). Refer to Table 5 for the regression table.
Question 3.1: Does gender moderate the association between COVID-19 related stress and depression in the pandemic situation?

As stated, the regression indicated that collectively, stress related to COVID-19 explained nearly 42.3% of the variance in reported symptoms of depression with Social Isolation and Academic stress emerging as unique individual predictors of depression. To investigate whether the association between a particular type of stress and depression, a moderator analysis with bootstrap was performed using PROCESS Macro for SPSS. The outcome variable for the analyses was depression. The predicting variable was a type of COVID-19 related stressor (i.e., Fear of Virus, Economic Hardship, Social Isolation, Missing Events, and Academic Stress). The moderator variable evaluated in the analyses was gender, which used only participant who identified as a man or as a woman due to the small representation of people who identified as
gender diverse \((n = 232)\), and gender was grand mean centered. The association between depression and the five types of stress were all tested separately as individual models. That is, five analyses in total were conducted to answer this question. Further, all five models were significant, which indicates that there was statistical strength among all of the key variables. COVID-19 related stressors and symptoms of depression were significant Fear of Virus \((F(3,227) = 12.75, p = .000)\), Economic Hardship \((F(3,228) = 26.28, p = .000)\), Social Isolation \((F(3, 228) = 34.91, p = .000)\), Missing Events \((F(3,228) = 12.71, p = .000)\), and Academic Stress \((F(3, 228) = 39.87, p = .000)\). Gender, however, was not a significant moderator for any of the models: Fear of the Virus \((\Delta R^2 = .001; B = .842; t = .534 95\% CI: -4.17, 1.16; p = .390)\), Economic Hardship \((\Delta R^2 = .002; B = -1.46; t = -.806 95\% CI: -4.34, 3.37; p = .804)\), Social Isolation \((\Delta R^2 = .005; B = 1.45; t = 1.32 95\% CI: -0.522, 3.42 ; p = .187)\), Missing Events \((\Delta R^2 = .001; B = .678; t = .550 95\% CI: -1.55, 3.04; p = .583)\), Academic Stress \((\Delta R^2 = .001; B = .447; t = .449 95\% CI: -1.33, 2.23; p = .654)\).

Question 4: What profiles of perceptions of social support emerge for young adults across the four sources of support in the pandemic situation?

An LPA was conducted in Mplus Version 8 (Muthén & Muthén, 2017) using maximum likelihood estimation on the four sources of social support mean subscale scores (Family Support, Faculty Support, Close Friend/ Significant Other Support, and Peer/Community Support). Latent profile analysis was used to identify profiles of social support that may suggest similar patterns of social support frequencies from the various sources. A step approach was used to assess fit indices of models with a growing number of profile solutions starting with a one class model. This approach was used to analyze models from a one profile model up to a six-
profile model, which previous research has often assessed up to a six-class solution to identify the best-fitting models (Ferguson et al., 2020; Masyn, 2013; Tein et al., 2013).

Fit indices were utilized to determine the number of latent classes difference (Ferguson et al., 2020; Nylund et al., 2007). Fit indices used to identify model fit include a lower BIC and Adjusted BIC (Ferguson et al., 2020; Nylund et al., 2007; Tein et al., 2013; Yang, 2006). Additionally, the Lo-Mendell-Rubin likelihood ratio test (LMR LRT) and bootstrap likelihood ratio test (BLRT) examine if the model being analyzed ($k$) is a better fit than the model with one less profile ($k - 1$). Further, if the LMR LRT and BLRT are significant, the tested model ($k$) is a better fit than the model with one less profile (Nylund et al., 2007). In addition, entropy values above .80 indicate that a model is highly discriminative and creates unique profiles with strong classification likelihood (Clark & Muthén, 2009; Ferguson et al., 2020; Muthén & Muthén, 2017; Tein et al., 2013). Finally, the chosen model must be supported theoretically (Ferguson et al., 2020). In all, the best-fitting model includes a combination of low BIC, Adjusted BIC, entropy above .80, significant LMR LRT and BLRT values, and robust theoretical support (Ferguson et al., 2020).

The three-class model emerged as the best fit (refer to Table 7 and Figure 2). Specifically, the three-class model had a lower BIC than the two-class model, the VLMR LRT and the bootstrap LRT were significant, and the BIC was lower, and the entropy was higher, demonstrating that the three-class model fits significantly better than the two-class model. Further, the four-profile model was not as good of a fit as the three-profile model because the VLMR LRT was not significant.
Figure 2: A three-profile solution of social support across sources.

Further, the groups of the three-class model converged with the pre-existing social support theory. Further, coverage values (i.e., the ability of the model to produce replicated confidence intervals that “contain the true population parameter”; Nylund, Asparouhov, & Muthén, 2007) for the three-profile solution were calculated. Each parameter (i.e., family support, close friend/significant other support, peer support, faculty/staff support) was strong as all values were 1.00. Further, classification accuracy (i.e., likelihood of classification into another latent profile, given classification into one latent profile; Masyn, 2013) was also examined (see Table 4). Classification accuracy values exceeding .85 indicate low likelihood that cases would be better represented by membership in any other latent profile (Masyn, 2013).
All classification values for the current model ranged from 0.820-0.892 indicates an overall strong accuracy. Thus, there is a strong likelihood that the model presents a valid approximation to the parameters within the population even despite the small sample represented in the second profile. Additionally, all latent class probabilities were strong and discriminatory to other profiles (see Table 6 and Table 7). These probabilities indicate that each emerged profile is distinct from the others. Based on these statistics, the three-profile model was selected and utilized for the current study. Refer to Table 8 for fit indices for models ranging from one profile to 6 profiles.
Table 8

Results of Latent Profile Analysis for Emerged Source of Social Support Profiles (N = 240)

<table>
<thead>
<tr>
<th>Model</th>
<th>BIC</th>
<th>Adjusted BIC</th>
<th>VLMR LRT $p$</th>
<th>Bootstrap LRT $p$</th>
<th>Entropy value</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-profile</td>
<td>3043.08</td>
<td>3017.73</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-profile</td>
<td>2859.47</td>
<td>2818.26</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
<td>.755</td>
<td>.47</td>
<td>.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-profile</td>
<td><strong>2839.17</strong></td>
<td><strong>2782.12</strong></td>
<td><strong>.040</strong></td>
<td><strong>&lt; .001</strong></td>
<td><strong>.736</strong></td>
<td><strong>.48</strong></td>
<td><strong>.37</strong></td>
<td><strong>.15</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-profile</td>
<td>2825.86</td>
<td>2752.96</td>
<td>.312</td>
<td>&lt; .001</td>
<td>.756</td>
<td>.21</td>
<td>.35</td>
<td>.10</td>
<td>.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-profile</td>
<td>2830.09</td>
<td>2741.34</td>
<td>.167</td>
<td>&lt; .001</td>
<td>.793</td>
<td>.23</td>
<td>.01</td>
<td>.34</td>
<td>.11</td>
<td>.30</td>
<td></td>
</tr>
<tr>
<td>6-profile</td>
<td>2823.17</td>
<td>2718.57</td>
<td>.419</td>
<td>&lt; .001</td>
<td>.819</td>
<td>.16</td>
<td>.08</td>
<td>.09</td>
<td>.14</td>
<td>.22</td>
<td>.31</td>
</tr>
</tbody>
</table>

Note. Bold indicates best the fitting model. BIC = Bayesian information criterion, VLMR LRT = Vuong-Lo- Mendell-Rubin likelihood ratio test, Bootstrap LRT = bootstrap likelihood ratio test.
Qualitative labels were assigned to the three profiles (see Table 9). These labels were based on the level of social support from different sources that informed the creation of each profile. The scale used to measure frequency of social support across sources used a 6-point Likert scale ranging from *Never* to *Always*. The names are based on the quantitative descriptors used on the scale itself. For instance, social support across sources for profile three

Table 9

Means and Standard Deviations of Key Variables by Profile

<table>
<thead>
<tr>
<th>Variable</th>
<th>“Some of the Time” M(SD)</th>
<th>“Most of the Time” M(SD)</th>
<th>“Almost Always” M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Support</td>
<td>3.31 (0.99)</td>
<td>4.19 (1.02)</td>
<td>5.40 (0.83)</td>
</tr>
<tr>
<td>Close Friend/ Sig Other Support</td>
<td>3.18 (0.89)</td>
<td>4.66 (0.72)</td>
<td>5.71 (0.41)</td>
</tr>
<tr>
<td>Peer Support</td>
<td>3.04 (0.91)</td>
<td>4.12 (0.95)</td>
<td>5.26 (0.81)</td>
</tr>
<tr>
<td>Faculty Support</td>
<td>3.39 (1.03)</td>
<td>3.85 (1.11)</td>
<td>5.18 (0.88)</td>
</tr>
</tbody>
</table>

Chi-squared tests of independence were run to determine whether there were demographic differences, such as race, grade level, gender, SES, and age, by profiles. A significant chi-squared test of independence would indicate associations by the profile and demographic categorical values. Results of the chi-squared tests of independence on race, gender, grade level, and age all came out as not significant (race $\chi^2(8) = 10.74, p = .217$; gender $\chi^2(4) = 6.37, p = .173$ grade level $\chi^2(16) = 6.83, p = .34$; age $\chi^2(4) = .653, p = .957$; SES $\chi^2(4) = 4.81, p = .307$). Thus, it can be inferred that profile membership did not significantly differ by the mentioned demographics (see Table 10).
Table 10

Prevalence of Demographic Groups Within Each Profile

<table>
<thead>
<tr>
<th>Variable</th>
<th>n (% of Total Subgroup)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Some of the Time” Some Support</td>
</tr>
<tr>
<td>Total (N = 240)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>17 (48.6%)</td>
</tr>
<tr>
<td>Men</td>
<td>16 (45.7%)</td>
</tr>
<tr>
<td>Gender Diverse</td>
<td>2 (5.6%)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>12 (33.3%)</td>
</tr>
<tr>
<td>African American</td>
<td>12 (33.3%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>7 (19.4%)</td>
</tr>
<tr>
<td>Asian American/ Asian</td>
<td>5 (13.9%)</td>
</tr>
<tr>
<td>Two or more races</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Grade Level</td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>18 (50.0%)</td>
</tr>
<tr>
<td>Sophomore</td>
<td>8 (22.2%)</td>
</tr>
<tr>
<td>Junior</td>
<td>7 (19.4%)</td>
</tr>
<tr>
<td>Senior</td>
<td>3 (8.3%)</td>
</tr>
<tr>
<td>SES</td>
<td></td>
</tr>
<tr>
<td>Lower Income</td>
<td>6 (17.1%)</td>
</tr>
<tr>
<td>Middle Income</td>
<td>22 (62.9%)</td>
</tr>
<tr>
<td>Upper Income</td>
<td>7 (20.0%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>18-20</td>
<td>26 (76.5%)</td>
</tr>
<tr>
<td>21-23</td>
<td>6 (17.6%)</td>
</tr>
<tr>
<td>24-26</td>
<td>2 (5.9%)</td>
</tr>
</tbody>
</table>

An ANOVA was run to analyze if there were significant mean differences in depression by profile. There was a significant difference in reports of depressive symptoms by groups $F (237, 2) = 6.361, p < .02$. Specifically, there were significantly higher reports of depressive symptoms from members of the Frequent Support profile and the Some Support profile than the Constant Support profile ($p = .004$ and $p = .019$ respectively). There were not significant differences, however, in symptoms of depression between the Frequent Support profile and the Some Support profile ($p = .898$).
A MANOVA was conducted to analyze if there were significant mean differences in COVID-19 related stressors by profile. There were not significant differences in COVID-19 related stressors by profile Wilk’s $\lambda = .935$, $F(10, 464) = 1.596$, $p = .105$. Post hoc analyses, however, indicated that there were individual significant differences by profile in Academic Stress ($p = .025$).

Question 5: Does social support profile membership moderate the association between COVID-19 related stress and symptoms of depression in the pandemic situation, and, if so, which profiles are significant moderators of the association between COVID-19 related stress and symptoms of depression?

Moderation analyses using bootstrapping parameters investigating whether the social support profile strengthened or weakened (i.e., moderated) the association between the predictor, independent variable of COVID-19 related stressor with the outcome, dependent variable of depression were conducted on the whole sample ($N = 240$). Because the study investigates COVID-19 related stress as five different types of stress and not stress overall, the moderation analyses was run five times. That is, five analyses were run with one type of COVID-19 related stressor as the predicting, independent variable in each analysis. For example, in the first analyses, Fear of the Virus was the independent, predicting variable, depression was the dependent, outcome variable, and social support profile was the moderating variable. In the second analysis, Social Isolation replaced Fear of the virus with all other variables staying
constant. The same procedure was used for the remaining three types of COVID-19 related stress.

As stated above, in the first analyses, Fear of the Virus was the independent, predicting variable, depression was the dependent, outcome variable, and social support profile was the moderating variable. This model indicated that profile membership did not significantly moderate the association $F(1, 235) = .1082, p = .348, \Delta R^2 = .0033 (-1.296, 3.345)$. Further, the second analysis included Economic Hardship as the independent, predicting variable, depression was the dependent, outcome variable, and social support profile was the moderating variable. The analyses indicated that the association between Economic Hardship and symptoms of depression was not moderated by profile membership $F(1, 236) = 1.30, p = .255, \Delta R^2 = .004, (-.720, 3.22)$.

Next, the third analysis included Social Isolation as the independent, predicting variable, depression was the dependent, outcome variable, and social support profile was the moderating variable. Within this model, the association between Social Isolation with symptoms of depression was not significantly moderated by profile moderation $F(1, 236) = .561, p = .430, \Delta R^2 = .002, (-.915, 2.014)$. Further, the fourth analysis included Missing Events as the independent, predicting variable, depression was the dependent, outcome variable, and social support profile was the moderating variable. In this model, the association between Missing Events and symptoms of depression was not moderated by profile membership $F(1, 236) = -.471, p = .594, \Delta R^2 = .0011 (-2.408, 1.438)$. Finally, the fifth model included Academic Stress as the independent, predicting variable, depression was the dependent, outcome variable, and social
support profile was the moderating variable. For Academic Stress, profile membership did not significantly moderate the association $F(1, 236) = -.404, p = .570, \Delta R^2 = .009 (-1.809, .886)$.

**Question 5.1: Does gender moderate the social support profile membership moderation of the association between COVID-19 related stress and symptoms of depression in the pandemic situation?**

Moderated Moderation analyses using bootstrapping parameters investigating whether gender moderated the social support profile moderation of the association between the predictor, independent variable of COVID-19 related stressor with the outcome, dependent variable of depression was conducted (see Table 11 for means and standard deviations of independent and dependent variables by profile and gender). Due to small a small representation of participants who identify as gender diverse, these cases were removed the for analyses. Additionally, participants who chose not to report their gender were also removed. The final sample for the analyses was $n = 232$. Because the study investigates COVID-19 related stress as five different types of stress and not stress overall, the moderation analyses was run five times. That is, five analyses were run with one type of COVID-19 related stressor as the predicting, independent variable in each analysis. For example, in the first analyses, Fear of the Virus was the independent, predicting variable, depression was the dependent, outcome variable, social support profile was the first moderating variable ($W$), and gender was the second moderating variable ($Z$). In the second analysis, Social Isolation replaced Fear of the virus with all other variables
staying constant. The same procedure was used for the remaining three types of COVID-19 related stress.

Table 11
Means and Standard Deviations of Independent and Dependent Variables by Profile and Gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>“Some of the Time” Some Support</th>
<th>“Most of the Time” Frequent Support</th>
<th>“Almost Always” Constant Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>Women 22.83 (11.57)</td>
<td>Women 21.01 (10.82)</td>
<td>Women 16.44 (10.97)</td>
</tr>
<tr>
<td></td>
<td>Men 25.00 (14.38)</td>
<td>Men 23.19 (11.64)</td>
<td>Men 23.12 (11.54)</td>
</tr>
<tr>
<td>Fear of the Virus</td>
<td>Women 18.34 (7.50)</td>
<td>Women 17.56 (8.41)</td>
<td>Women 13.78 (10.28)</td>
</tr>
<tr>
<td></td>
<td>Men 2.36 (0.70)</td>
<td>Men 2.42 (0.97)</td>
<td>Men 2.37 (1.01)</td>
</tr>
<tr>
<td>Economic Hardship</td>
<td>Women 3.03 (0.84)</td>
<td>Women 2.60 (1.00)</td>
<td>Women 2.67 (1.12)</td>
</tr>
<tr>
<td></td>
<td>Men 2.22 (0.66)</td>
<td>Men 2.13 (0.86)</td>
<td>Men 2.02 (0.96)</td>
</tr>
<tr>
<td>Social Isolation</td>
<td>Women 2.00 (0.71)</td>
<td>Women 1.94 (0.93)</td>
<td>Women 1.78 (0.88)</td>
</tr>
<tr>
<td></td>
<td>Men 2.20 (1.54)</td>
<td>Men 2.05 (0.99)</td>
<td>Men 2.07 (0.96)</td>
</tr>
<tr>
<td>Missing Events</td>
<td>Women 1.68 (0.60)</td>
<td>Women 1.77 (0.80)</td>
<td>Women 1.48 (0.56)</td>
</tr>
<tr>
<td></td>
<td>Men 2.51 (1.12)</td>
<td>Men 2.47 (1.20)</td>
<td>Men 2.23 (1.20)</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>Women 2.67 (1.62)</td>
<td>Women 2.58 (1.21)</td>
<td>Women 2.85 (1.18)</td>
</tr>
<tr>
<td></td>
<td>Men 2.33 (1.07)</td>
<td>Men 2.29 (1.18)</td>
<td>Men 2.10 (1.06)</td>
</tr>
<tr>
<td></td>
<td>Women 2.81 (1.02)</td>
<td>Women 3.16 (1.17)</td>
<td>Women 3.15 (1.23)</td>
</tr>
<tr>
<td></td>
<td>Men 3.65 (1.11)</td>
<td>Men 3.25 (1.22)</td>
<td>Men 3.26 (1.23)</td>
</tr>
<tr>
<td></td>
<td>Women 2.58 (0.69)</td>
<td>Women 3.02 (1.08)</td>
<td>Women 2.96 (1.31)</td>
</tr>
<tr>
<td></td>
<td>Men 3.07 (1.16)</td>
<td>Men 3.45 (2.00)</td>
<td>Men 2.99 (1.38)</td>
</tr>
<tr>
<td></td>
<td>Women 3.80 (1.18)</td>
<td>Women 3.62 (1.21)</td>
<td>Women 3.12 (1.38)</td>
</tr>
<tr>
<td></td>
<td>Men 2.69 (0.98)</td>
<td>Men 3.18 (1.14)</td>
<td>Men 2.76 (1.37)</td>
</tr>
</tbody>
</table>

In the first analyses, Fear of the Virus was the independent, predicting variable, depression was the dependent, outcome variable, social support profile was the first moderating variable, and gender was the second. As stated in the previous question, profile membership was not a significant moderator of the association. Similarly, the interaction between gender, profile membership, and Fear of the Virus was also not significant $F (1, 223) = 1.563, p = .526, \Delta R^2 = 0.002$ 95% CI: -3.291, 6.418. The second analyses, included Economic Hardship as the independent, predicting variable, depression was the dependent, outcome variable, social support profile was the first moderating variable, and gender was the second. As stated in the previous
question, profile membership was not a significant moderator of the association. Further, the interaction between gender, profile membership, and Economic Hardship was also not significant $F (1, 224) = -.143, p = .954, \Delta R^2 = .000 \text{ 95\% CI: -5.045, 4.760}$. Next, Social Isolation was entered as the independent, predicting variable, depression was the dependent, outcome variable, social support profile was the first moderating variable, and gender was the second. As stated in the previous question, profile membership was not a significant moderator of the association. Further, the interaction between gender, profile membership, and Social Isolation was also not significant $F (1, 224) = -.637, p = .682, \Delta R^2 = .001 \text{ 95\% CI: -3.700, 2.426}$.

Subsequently, Missing Events was entered as the independent, predicting variable, depression was the dependent, outcome variable, social support profile was the first moderating variable, and gender was the second. As stated in the previous question, profile membership was not a significant moderator of the association. Further, the interaction between gender, profile membership, and Missing Events was also not significant $F (1, 224) = -.738, p = .706, \Delta R^2 = .001 \text{ 95\% CI: -4.592, 3.116}$. Finally, Academic Stress was entered as the independent, predicting variable, depression was the dependent, outcome variable, social support profile was the first moderating variable, and gender was the second. As stated in the previous question, profile membership was not a significant moderator of the association. Further, the interaction between gender, profile membership, and Academic Stress was also not significant $F (1, 224) = 1.108, p = .944, \Delta R^2 = .000 \text{ 95\% CI: -2.843, 2.301}$
CHAPTER 5

DISCUSSION

The current study sought to investigate stress, social support, and symptoms of depression and the associations among these constructs amidst the pandemic in a young adult, undergraduate sample. An approach based on the Stress Buffering Model was used to investigate how various types of COVID-19 related stress related to levels of depression and the potential for sources of social support to buffer against negative outcomes (e.g., depression) in undergraduate sample amidst the pandemic. The study also investigated whether there were gender differences throughout the reported study constructs. To explore these constructs and how they related to each other, five questions were posed by the current study that investigated, for undergraduates during the pandemic, COVID-19 related stressors, depressive symptoms, associations between stressors and depressive symptoms, social support profiles, and the associations among COVID-19 related stressors, social support, and depressive symptoms. Gender, race and socioeconomic status differences were explored within each question when applicable.
Review of Findings

Social Support

The study explored the metrics of a modified social support scale and found evidence that scores were valid and reliable estimates of social support across sources in a young adult, college attending sample. There were no differences in students’ perceptions of social support by race, socioeconomic status, age, or grade level in the sample, which indicates that perceptions of the levels of social support received were similar across these groups. In addition, there were no differences in social support across living situations suggesting that living with others did not result in significantly higher reports of social support than to those who lived alone. Also, men and women reportedly perceived similar levels of social support across all sources. Typically, women are found to report more social support than men are (Demaray & Malecki, 2002; Lazányi, 2017; Rueger et al., 2016). However, the similar reports of social support from women and men perhaps suggest a similar reliance on multiple sources of support across men and women particularly under COVID conditions. Differences in the levels of social support received from the different sources were found within the whole sample. More support was reportedly available from family than from faculty; however, more support was perceived from close friends and significant others than from family, peers, and faculty. These findings are in line with prior work that indicates people perceive more support from more intimate sources of support than from sources that they interact with less often, such as faculty (Lyell et al., 2020; Rueger et al., 2016; Tardy, 1985).
COVID-19 Related Stress

Reported types of stress related to COVID-19 in the current study included Fear of the Virus, Economic Hardship, Social Isolation, Fear of Missing Events, and Academic Stress. In the current study women were found to report significantly more stress related to Fear of the Virus, Economic Hardship, Academic Stress, as well as stress overall than men. Pre-existing work supports this finding as a robust amount of work indicates that women report more stress on average than do men (Christiansen & Elklit, 2008; McGinty et al., 2020). There were not significant differences in COVID-19 related stress by race, socioeconomic status, or the interaction of the two. This finding may suggest that young adults in college across all demographics during COVID-19 experienced elevated levels of stress. There were, however, significant differences in COVID-19 related stress by living situation such that Fear of the Virus was significantly higher for those who lived at home than those living on-campus with a roommate. Young adults living at home may have experienced greater stress due to holding additional roles at home such as a caretaker for older and/or younger family members or holding a job outside of the home. They also may have feared contracting the virus to more vulnerable populations that lived in the home such as older family members.

There were also significant differences in stress by age and grade level such that older students and students who were in upper grade levels (i.e., juniors and seniors) reported more stress related to Economic Hardship than younger students. This perhaps is because older students may be looking to pay off accumulating college loans and may have stress surrounding searching for a post-graduate job. Additionally, older undergraduates may receive less financial support from family than younger or be supporting a family of their own. Similarly, upper class
students reported significantly more stress related to Economic Hardship and Fear of the Virus than lower classmen, specifically seniors compared to freshman students, which may be related to previously stated economic differences and greater exposure to vulnerable populations consequential of taking on caregiver roles. In all, a high level of stress was reported from a majority of the sample across numerous types typical of young adulthood and novel consequential of the pandemic.

**Levels of Depression**

The current study found similar reports of depression such that most of the sample reported significant levels of depression. In the overall sample, women reported more symptoms of depression on average than men, which converges with a robust work indicating that women are more likely to experience symptoms of depression and to be diagnosed with depression than men (Merikangas et al., 2010; Patsali et al., 2020). There were not, however, differences in symptoms of depression by race, socioeconomic (SES) status, or the interaction between the two. Past work suggests that differences by SES and race are typically found when investigating levels of depression (Ozdin & Ozdin, 2020; Rajkumar, 2020); however, reports of depression increased across all demographics over the course of COVID-19 (Barzilary et al., 2020; Liu et al., 2020; Qiu et al., 2020; Saltzman, et al., 2020; Wang et al., 2020).

**Associations between COVID-19 Related Stress and Depression**

The study found that the combination of a variety of stressors was significantly associated with symptoms of depression such that more reported stress across all types was related to more reported symptoms of depression. In addition, Economic Hardship, Social
Isolation, and Academic Stress were uniquely associated with symptoms of depression, which aligns with prior work suggesting that secondary stressors, such as economic burden and social isolation, in young adults are more strongly associated with stress than reports of stress specific to COVID-19 (e.g., Fear of the Virus; Reger, et al., 2020). Young adults in college also experienced unique added stress associated with academics, which were found to be notable areas of stress in young college adults throughout the pandemic in both prior work and the current study (Patsali et al., 2020; Pragholaapati, 2020). In the current study, gender did not strengthen or weaken this association, in line with other work conducted throughout the pandemic that indicates that that both men and women are at increased risk of higher prevalence of symptoms of depression (Birditt et al., 2020; McGinty et al., 2020; Montano & Acebes, 2020).

Sources of Social Support Profiles

The current study investigated sources of social support in a young adult sample during the pandemic by looking at social support as a network of sources that one can receive support from, which was achieved by using latent profile analysis (LPA). The decision to use the three-profile model instead of the two-profile model was informed by empirically supported interpretation guidance including fit-indices and prior work (Nylund et al., 2007; Kelly & Malecki, 2021; Muthén & Muthén, 2017; Rueger et al., 2016). The emerged profiles were named based on the levels of perceived support from each source and the qualitative labels used on the scale. The names of the three-emerged profiles were: 1) Some Support, 2) Frequent Support, and 3) Constant Support. The study predicted that profiles with mixed levels of social support would emerge, but this was not found as the profiles consisted of similar levels of social support across the sources. However, evidence of mixed perceptions of social support across
sources in a high school has been found in prior work (Kelly & Malecki, 2021). Mixed profiles did emerge in the current sample with the four and five profile solutions despite not being the best fit for the sample. Support may be found, however, in a larger sample with more age diversity. For example, Li and colleagues (2021) utilized LPA to investigate social support across sources in a large sample of Chinese citizens ages 18-85. Their results identified five profiles of social support with similar patterns of social support across sources in all groups. However, there were significant differences by age groups amidst the distribution, which may suggest that different profiles may emerge for narrower age-groups. The lack of mixed profiles may have also been due to people receiving more support from less intimate sources (e.g., peers and teachers) than they do during ordinary times due to the communal response to the pandemic (Ellis & Dumas, 2020; Gilligan, 2021).

Engaging with synchronous social media platforms like FaceTime and Zoom for communal gatherings like in-real-time classes or, perhaps, in real time work out videos (e.g., peloton), is suggested to effectively foster empathy and a sense of connection, which are associated with an increase in psychological well-being (Ellis & Dumas, 2020). Additionally, the stress matching hypothesis promotes that an appropriate match between source of social support and type of stress promotes engaging in effective coping strategies specific to the presenting stress (Bolger & Amarel, 2007). Thus, if academic stress was higher during the pandemic than it was during typical times, undergraduates may have sought out and utilized faculty support more often than before the pandemic. In all, the use of LPA to investigate levels of social support across sources remains a supported approach for investigating networks of social support, particularly with the constant evolution of ways people can connect and established age differences (Ellis & Dumas, 2020; Gilligan, 2021; Li et al., 2021).
Demographic Make-Up of Social Support Groups

In line with the lack of differences in social support found across demographics in the preliminary results, there were few differences in profile membership by demographics found between the profiles such that there were no significant differences in profile membership by gender, race, grade level, SES or age. This finding aligns with empirical work published during COVID-19 suggesting that young adults across all demographics perceived moderate to high levels of social support (Lui et al., 2020; Özmete & Pak, 2020). However, literature on gender differences in perceived social support has been mixed (Grey et al., 2020). Prior to the pandemic some studies did suggest gender, race and SES differences in social support, particularly from less intimate sources, such that people who were women, White and middle to upper class reported more perceived social support than individuals who were men or were a part of minority groups (Hefner & Eisenberg, 2009; Peek & O’Neil, 2001; Schafer & Varga, 2016; Sloan et al., 2013). Perhaps the similar perceptions of perceived support across sources from various demographics is consequential of these data being collected a year into the pandemic. At the time, social distance regulations were lessening so an increase of social support seeking behavior and an increase in perceptions of support compared to support available early in the pandemic may have been found.

COVID-19 Related Stress and Depression Differences among Profiles

As predicted, significant differences in depressive symptoms were found among social support profiles. Significant differences in reports of depression symptoms were found such that those with the highest levels of reported support (Constant Support) reported significantly lower
depressive symptoms than the other two groups (Frequent Support and Some Support). This finding supports the General Benefits Model, which suggests that having social support is a general protective factor against negative outcomes (McMahon et al., 2019; Rueger et al., 2016). However, previous studies investigating social support as a protective factor suggested that only an “adequate” level of support is needed to sufficiently protect against negative outcomes (Malecki & Demaray, 2003; Rueger et al., 2016). That is, “more” support is not necessarily better than “adequate” support. In contrast, the results of the current study support the General Benefits Model. These findings may suggest that in conditions of extreme strife, a staggering amount of support across all sources is needed to effectively protect against negative outcomes. Further, the study did not find any significant differences in COVID-19 related stressors by profile. This finding may be due to ceiling effects of high levels of stress across all COVID-19 related stressors.

Profile and Gender Moderation of the COVID-19 Related Stress and Depression Association

The study explored whether profiles buffered against the stress-depression association more strongly for women than men or vice versa. As mentioned, higher levels of COVID-19 related stress were observed alongside more symptoms of depression. Greater support from all sources of social support were observed with fewer reports of depressive symptoms. However, the current study did not find that the social support profiles or networks moderated (i.e., weakened or strengthen) the association between any type of COVID-19 related stress and depression. Therefore, the study did not find support for the Stress Buffering Model. In addition, gender did not moderate the moderation of the profiles on the studied association, which
suggests that relying on social support did not serve as a stronger protective factor for men than women or vice versa.

Limitations

The current study is not without limitations. Participants remotely participated via a self-reported survey, and limitations to self-reported data include response biases that may minimize or exaggerate experiences to conform to perceived research expectations. One specific example of bias may be the discrepancy of the levels of depression reported by men and women in the current sample. Perhaps these levels are inaccurate due to men not being as comfortable reporting mental health symptoms than women. However, these data were collected anonymously to minimize the likelihood of response bias. The study collected responses at one single point of time during the middle of the pandemic limiting the study’s ability to generalize these results to any other point in time throughout the pandemic. The current study addressed this limitation by using measures that asked participants to reflect on their experiences over the course of a couple of weeks to prompt participants to promote responses that represented their experience beyond the single day they participated.

In addition, responses were only collected from undergraduate students that attend a moderately sized midwestern, public university located in the far outside suburbs of a large urban area, which limits the generalizability of the results to students at other levels of education (e.g., high school or graduate school) as well as undergraduate students from other geographic areas. In addition, the study only gathered data from an undergraduate, introductory psychology class, may over or under represent students in varying majors and largely targeted a lower grade level population. Due to the limited sample size and diversity, the study may not have enough
participants to look at the intersectionality (i.e., interactions) between race and socioeconomic status. However, the study included a diverse sample that closely resembled the national representation of various demographics such as race, socioeconomic status, and gender. The university includes a diverse student population from various areas such as rural, suburban, and urban residences. Further, how the study assessed socioeconomic status was a limitation due the question not explicitly differentiate whether the participant should report their parent’s annual income or the income that they themselves were living on. Additionally, it is possible that participants did not know how much annual income their family, which could mean that they falsely reported the income level. The study also had limitations related to the utilized scales such that the COVID-19 related stress and social support scales, which were newly developed measures. However, both measures were created using empirically supported frameworks of pre-existing measures and have been supported by the current study and other research teams (Demaray, Malecki, & Elliott, 2004; Styck et al., 2021).

Finally, the study used Latent Profile Analysis (LPA) data approaches to create profiles of social support across sources. The lack of consensus on how to determine the number of emerged profiles is a limitation; however, the use of LPA continues to grow in popularity and a growing body of work has investigated best-practices in interpreting the output. Further, the third profile in the current study had a relatively small population, which may indicate that the two-profile solution may have been a stronger fit; however, the current study determined the profile solution based on fit indices proposed by Muthén and Muthén (2007) and Nylund and colleagues (2007) as well as the strong theoretical support for the emerged profiles (Herman et al., 2007).
Implications

The study investigated social support and mental health in American, undergraduate students, which is a population not often explored. This literature gap is important to fill because of the unique transitional period undergraduate students face as they navigate stressors that are typical young adulthood, such as economic stress, as well as stressors unique school like academic stress. Young adults in college often report more types of stress, consequentially perhaps more stress, than their young adult peers not in school due to the addition of school stress and less financial stability, which increases when national and global events arise like the pandemic (Lee et al., 2018; Patsali et al., 2020; Pragholapati, 2020). The study fills these gaps in the literature indicating that various types of stress are strongly associated with depression (Cooke et al., 2020; Demaray et al., 2021; Reger, et al., 2020). More specifically, in the case that another pandemic, a war, or a natural disaster occur, the current study informs responders, higher education institutions along with mental health and government agencies that young adults in college are likely to experience greater and more types of stress and, consequently, depressive symptoms, than any other population. Future studies are encouraged to explore the lasting effects of these stressors and the duration of consequential symptoms of depression in an undergraduate sample because the stress and internalizing experiences of undergraduate students today may affect the mental health and social, economic, and work-related behaviors of an entire generation. The study also encourages higher education and mental health agencies to emphasize the importance to build community amongst students, to foster healthy faculty- student relationships, and to create opportunities for families to provide support. In addition, it may suggest that higher education agencies would benefit to embed more regular screenings for
symptoms of depression within the general, student population perhaps in medical agencies and on-campus housing departments. Findings from the study promote public health agencies’ use of social support as a protective factor in conditions of national and global stress like pandemic, war, and natural disasters. Future studies are encouraged to explore and develop methods for increasing social support particularly for undergraduate students.

Conclusion

The study found support for five distinct types of COVID-19 related stress for young college-attending adults including Fear of the Virus, Economic Hardship, Social Isolation, Missing Events, and Academic Stress. Additionally, reports of levels of depressive symptoms in the current study were elevated with more than half of the sample meeting or exceeding criteria for being “at-risk” for depression with women reporting more symptoms than reported by men. More work investigating the longitudinal impact of stress and internalizing behaviors within this population is encouraged. Further, the study found that undergraduates reported receiving social support from various sources including family, faculty/staff, close friend/ significant other, and peer and community. In the sample, more support was perceived from family than from college faculty; however, more support was perceived from close friends and significant others than was perceived from family, peers, and faculty.

Findings of the study indicated that higher reports of stress across all types was related to more reports of symptoms of depression. Specifically, greater reports of Economic Hardship, Social Isolation, and Academic Stress were related to greater levels depressive symptoms. Further, using LPA, three profiles of social support emerged including lower, moderate, and higher levels of support profiles. These profiles, however, did not significantly moderate the
association between types of COVID-19 related stress and depression. Although the study did not find support for moderation, there was evidence for social support overall serving as a protective factor against negative outcomes, which supports the General Benefits Model of social support but not the Stress-Buffering Model. More empirical data are needed to explore the nuances of social support in young adult populations to better understand the give and take nature of social support with various sources at this age is needed.

In all, results from the current study add meaningfully to both the growing COVID-19 literature and work on social support using a diverse sample of young adults in college. The current study is one of the few studies that capture the negative outcomes in an undergraduate sample amidst COVID-19 and extends this work to investigate the social support across multiple sources of support as a protective factor. The study also highlights the great levels of stress and symptoms of depression that young adults in college experienced during the pandemic, which is a trend that may continue to be seen throughout the rest of the pandemic and beyond. Findings from this study promote the use of social support from various sources as a protective factor.
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Call to Participate in a COVID-19 Study

Calling all undergraduate students!

We are requesting your assistance with a study conducted by a researcher at Northern Illinois University on COVID-19 Stress, mental health, and social support. You must be at least 18 years of age to participate and you must currently be enrolled in an undergraduate program. The study will take you approximately 20 minutes.

This study is completely voluntary and anonymous, so please do not enter any identifying information into the survey. All data will be stored in a password protected file. The research team has pledged to keep your data confidential and only to report aggregated results in any published scientific study.

If you have any questions you may contact the lead researcher Kathleen Kelly M.A. at kkelly8@niu.edu.

If you are able and willing to participate, please follow the link below for the survey:

https://niu.az1.qualtrics.com/jfe/form/SV_1GqTezOVbyF4kSx

Figure 3. Participation for extra credit in courses

SONA Course Credit Study Brief Description

“The goal of this online, self-report survey is to collect data about undergraduate students’ experiences during the COVID-19 pandemic. Particularly, we are interested in what types of social support young adults have and their experiences consequential of COVID-19 that create stress.”
APPENDIX B

INFORMED CONSENT
Study Title: Social support profiles as moderators of the association between COVID-19 stress and symptoms of depression in an undergraduate student sample.

Investigators
Name: Kathleen Kelly, MA  Dept: Psychology
Name: Christine Malecki, PhD  Dept: Psychology

Key Information
- This is a voluntary research study on understanding the COVID experiences of undergraduate students at Northern Illinois University. We are particularly interested in outcomes related to your social lives and mental health.
- This 30 minute study involves answering a series of questions related to experiences you’ve had related to the COVID era, your social network and the people in it, and your current mental health.
- The benefits include the researchers learning about how to apply the findings to better support all university students and to help students in other schools in the future. The risks include the possibility of experiencing discomfort answering questions about your experiences, behaviors, and thoughts.

Description of the Study
The purpose of this study is to better understand the COVID experiences of undergraduate students at Northern Illinois University. We are particularly interested in outcomes related to your social lives and mental health. By choosing to complete the study, however, you will help researchers better understand how COVID has affected the social and mental health experiences of young adults in undergraduate programs.

Risks and Benefits
The study has the following risks: During the study, it is possible you may experience discomfort answering questions about your experiences, behaviors, and thoughts. This is considered a possible risk of the study. Please note that you can discontinue the survey at any time without negative consequence. Participation in this study is voluntary. By choosing to complete the study, however, you will help researchers better understand how COVID has affected the social and mental health experiences of young adults in undergraduate programs.

The benefits of participation are: If you are completing the survey for required or extra course credit, credit can only be granted if the survey is completed in entirety. To receive this credit, please follow the link provided at the conclusion of the survey. This link will redirect you to a different survey that will ask for your z-id and the course you are receiving credit for. This information will not be tied to the responses you filled in for the study. Please note that if you don’t follow the link and complete the following study, you will not be granted credit for participating. Individuals who choose to opt out of the study or discontinue before the end will be offered other opportunities for credit will be provided by your professor.

Anonymity
- This study is anonymous. We will not be collecting or retaining any information about your identity.
- The records of this study will be kept strictly confidential. Research records will be kept in a locked file, and all electronic information will be coded and secured using a password protected file.

Ultimately, the researchers may learn about how to support all young adults and apply this knowledge to help support young adult populations, particularly in higher education settings. In the event you experience an adverse reaction, please immediately reach out to mental health services such as your college or university’s
counseling and consulting services. Although not expected, Northern Illinois policy does not provide for compensation for treatment of any injuries that may result from participation in research activities. Information obtained during this study may be published in scientific journals or presented at scientific meetings, but your participation in this study would be anonymous and thus untraceable to you.

If you have any questions following the study, please contact Kathleen Kelly at kkelly8@niu.edu

Thank you for your time and participation.

Kathleen Kelly
Doctoral Candidate
Department of Psychology
Northern Illinois University
APPENDIX C

SURVEY QUESTIONS
Demographics

1. Do you consent to participating in the study? Yes; No
2. Current undergraduate year: Freshman; Sophomore; Junior; Senior; 5+ year
3. Race/Ethnicity you identify with the most: Black or African American; American Indian or Alaska Native; Asian; Native Hawaiian or Pacific Islander; Hispanic/Latino; White; Two or more races
4. Gender: Male; Female; Gender Diverse
5. Family’s typical annual household income (pre-COVID). Less than $26,000; $26,000-$53,399; $54,000-$99,999; $100,000-$249,999; $250,000 or above
6. Age: 18-20; 21-23; 24-26; 27-29; 30-32; 33-35; 36-39; 40-49; 50-59; 60+
7. Are you an international student? No; Yes
8. Do you have children? Yes; No
9. How many children do you have? 1; 2; 3; 4; 5 or more
10. Were you employed before COVID? Yes; No
11. Did COVID-19 affect your employment status? (Check all that apply) Still employed but with decreased hours; Still employed with increased hours; Still employed but have moved to online/remote work; Laid off; No change
12. Did COVID-19 affect your student status: (Check all that apply): Decreased hours, increased hours, move to both in-person and online/remote classes; moved to online/remote classes only; No change
13. Are you currently employed? Yes; No
14. What is your relationship status? Single; In a relationship; Engaged; Married; Divorced; Widowed
15. What is your current living situation? At home with family; On-campus with a roommate(s); Off-campus with a roommate(s); On-campus without a roommate; Off-campus without a roommate; Other

Center for Epidemiological Studies-Depression Scale (CES-D)
Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

Response options: Rarely or none of the time (less than 1 day); Some or a little of the time (1-2 days); Occasionally or a moderate amount of time (3-4 days); Most or all of the time (5-7 days)

During the past week...

16. I was bothered by things that usually don’t bother me.
17. I did not feel hungry; my appetite was poor.
18. I felt that I could not shake off the blues even with help from my family or friends.
19. I felt I was just as good as other people.
20. I had trouble keeping my mind on what I was doing.
21. I felt depressed.
22. I felt that everything I did was an effort
23. I felt hopeful about the future.
24. I thought my life had been a failure.
25. I felt fearful.
26. My sleep was restless.
27. I was happy.
28. I talked less than usual.
29. I felt lonely.
30. People were unfriendly.
31. I enjoyed life.
32. I had crying spells.
33. I felt sad.
34. I felt that people disliked me.
35. I could not get “going.”
COVID-19 Traumatic Stress Scale
The following are a set of statements and questions about Coronavirus (COVID-19) impacts. Please rate/answer each statement/question.

Response options: Not at all; A little; A moderate amount; A lot; A great deal

37. I am stressed around other people because I worry I’ll catch the coronavirus (COVID-19).
38. Thinking about the coronavirus (COVID-19) makes me feel threatened.
39. How concerned are you that you’ll be infected with the coronavirus (COVID-19).
40. Over the past two weeks, I have felt nervous and fearful about the future because of the coronavirus (COVID-19).
41. The coronavirus (COVID-19) has impacted me negatively from a financial point of view.
42. I have lost a job, or related income, due to the coronavirus (COVID-19).
43. I have had a hard time getting needed resources (i.e. food) due to the coronavirus (COVID-19).
44. It has been difficult for me to get the things I need due to the coronavirus (COVID-19).
45. Over the past two weeks, I have felt socially isolated as a result of the coronavirus (COVID-19).
46. Over the past two weeks, my life routines have been affected by the coronavirus (COVID-19) situation.
47. What is the extreme to which sheltering in place has negatively affected your relationship with others?

CASPE-Adapted Version
The following are a set of statements and questions about Coronavirus (COVID-19) impacts. Please rate/answer each statement/question.

Response options: Not at all; A little; A moderate amount; A lot; A great deal

48. I am stressed about falling behind on school work.
49. I have had a hard time concentrating on schoolwork.
50. I am worried that my family might get sick.
51. I have missed school events, activities, and sports (e.g. clubs, sports).
52. I have had a hard time getting a job.
53. I am concerned about increased family conflict.
54. I have had a hard time being motivated to do schoolwork.
55. I have missed going to community events (e.g. church, festivals).
56. It has been difficult not seeing friends in person.
57. I am worried that my friends might get sick.
58. I have missed events that were important to me (e.g. Greek life, orientation).
59. I have missed other non-school social activities (e.g. concerts, social outings).

Child and Adolescent Social Support Scale- College (CASSS-C)
The following questions ask about types of support or help that you might get from others in your life. Please answer all questions as best you can.

Response options: Never; Almost Never; Some of the Time; Most of the Time; Almost Always; Always

Family Subtest
The following questions ask about support or help that you get from your family members. This may include your parents, caregivers, siblings, or other relative(s).

My Family...
60. ... shows they are proud of me.
...understands me.
62. ...is a source of comfort when I am feeling sad or upset.
63. ...is sensitive to my personal needs.
64. ...shares my joys and sorrows.
65. ...makes suggestions when I don't know what to do.
66. ...gives me good advice.
67. ...helps me solve problems by providing me with helpful information.
68. ...provides me with good ideas for how to do things or make things.
69. ...acknowledges my accomplishments or shows excitement when I've done something well or worked hard at something.
70. ...offers constructive criticism on task or other things I've done.
71. ...tells me when I make mistakes in a way that helps me improve.
72. ...takes time to help me solve my problems.
73. ...helps me make decisions.
74. ...helps to prove the things I need (e.g. tuition, books, computer, rent).
75. ...supports me when I am going through a difficult time.
76. There is at least one member of my family I could go to if I am feeling down, without feeling funny about it later. Strongly Disagree; Somewhat Disagree; Slightly Disagree; Somewhat Agree; Slightly Agree; Strongly Agree
77. I have a deep sharing relationship with at least one member of my family. Strongly Disagree; Somewhat Disagree; Slightly Disagree; Somewhat Agree; Slightly Agree; Strongly Agree
78. Who were you primarily thinking of when you completed the previous questions? Mother/Mother Figure; Father/Father Figure; Sibling; Aunt/Uncle; Grandparent; Someone not technically family but "family like"

**Close Friend(s)/ Significant Other Subtest**

The following questions ask about support or help that you get from your close friend(s) or your significant other(s). This may include your best friend, close group of friends, and/or romantic partner(s). Pick one who is the most influential in your life and answer the questions below.

**My Close Friend(s)/ Significant Other...**
79. ...listens to me and understands my feelings
80. ...sticks up for me if others are treating me badly.
81. ...is a source of comfort when I am feeling sad or upset
82. ...cares about my feelings
83. ...shares my joys and sorrows.
84. ...makes suggestions when I don't know what to do.
85. ...gives me good advice.
86. ...helps me solve problems by providing me with helpful information.
87. ...provides me with good ideas for how to do things or make things.
88. ...acknowledges my accomplishments or shows excitement when I've done something well or worked hard at something.
89. ...offers constructive criticism on tasks or other things I've done.
90. ...tells me when I make mistakes in a way that helps me improve.
91. ...helps me when I need it.
92. ...shares their feelings with me.
93. ...takes time to help me solve my problems.
94. ...supports me when I am going through a difficult time.
95. ...is available when I am in need.
96. I have at least one close friend or romantic partner I could go to if I am feeling down, without feeling funny about it later. Strongly Disagree; Somewhat Disagree; Slightly Disagree; Somewhat Agree; Slightly Agree; Strongly Agree
97. Who were you primarily thinking of when you completed the previous questions? Close friend; Significant other
**Peers Community Subtest**
The following questions ask about support or help that you get from your peers with whom you spend your time. This could include peers in your class, residence hall, clubs, or other college-affiliated groups or activities.

**Peers I spend time with...**
98. ...treat me nicely.
99. ...make me feel welcomed and accepted.
100. ...pay attention and listen to me.
101. ...make me feel comfortable.
102. ...listen when I have problems.
103. ...give me ideas when I don’t know what to do.
104. ...give me good advice.
105. ...explain things that I don’t understand.
106. ...acknowledge my accomplishments or show excitement when I’ve done something well or worked hard at something.
107. ...offer constructive criticism on tasks or other things I’ve done.
108. ...tell me when I make mistakes in a way that helps me improve.
109. ...ask me to join activities.
110. ...spend time doing things with me.
111. ...help me with schoolwork when I need it.
112. ...help me with other things in life (e.g. assemble furniture, give me a ride, help take care of my pet or plant).
113. ...encourage me to overcome barriers.
114. ...give me the moral support I need.
115. There is at least one peer who I can consistently rely on for help with class or other things in life: Strongly Disagree; Somewhat Disagree; Slightly Disagree; Somewhat Agree; Slightly Agree; Strongly Agree

116. Who were you primarily thinking of when you completed the previous questions? (Check all that apply): People I live with; People from groups/teams/clubs I belong to; People from back home; Other

**Faculty/Staff Subtest**
The following questions ask about support or help that you get from faculty and staff at your college or university in general. This may include your instructors, advisors, or staff working in offices or libraries throughout campus.

**Faculty and staff at my college...**
117. ...care about me.
118. ...respect me.
119. ...make me feel comfortable to participate and ask questions.
120. ...show me how to do things.
121. ...help me solve problems by giving me information.
122. ...provide me with helpful feedback on assignments or other tasks.
123. ...tell me if I’ve made a mistake.
124. ...provide praise when I’ve done something well.
125. ...encourage me to pursue my academic or career interest.
126. ...help me to meet deadlines or complete assignments and tasks that otherwise would have been difficult to complete.
127. ...take time to help me learn to do something well.
128. ...spend time with me when I need help.
129. ...challenge me or present opportunities in a way that promotes my learning and growth.
130. Overall, I have good relationships with my instructors and advisors. Strongly Disagree; Somewhat Disagree; Slightly Disagree; Somewhat Agree; Slightly Agree; Strongly Agree
131. There is at least one faculty or staff member that I can seek emotional support from when I need it (e.g., when I feel anxious or fearful about something). Strongly Disagree; Somewhat Disagree; Slightly Disagree; Somewhat Agree; Slightly Agree; Strongly Agree
132. There is at least one faculty or staff member who serves as a role model for me. Strongly Disagree; Somewhat Disagree; Slightly Disagree; Somewhat Agree; Slightly Agree; Strongly Agree

Multidimensional Scale of Perceived Social Support (MSPSS)
We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Response Options: Very Strongly Disagree; Strongly Disagree; Mildly Disagree; Mildly Disagree; Neutral; Mildly Agree; Strongly Agree; Very Strongly Agree

133. There is a special person who is around when I am in need.
134. There is a special person with whom I can share my joys and sorrows.
135. My family really tries to help me.
136. I get the emotional help and support I need from my family.
137. I have a special person who is a real source of comfort to me.
138. My friends really try to help me.
139. I can count on my friends when things go wrong.
140. I can talk about my problems with my family.
141. I have friends with whom I can share my joys and sorrows.
142. There is a special person in my life who cares about my feelings.
143. My family is willing to help me make decisions.
144. I can talk about my problems with my friends.

COVID-19 Context Questions
145. Are you a frontline essential worker (e.g., nurse, bus driver, cashier)? Yes; No
146. Is someone you are close to a frontline essential worker? Yes; No
147. If so, who is the frontline worker? (Check all that apply): Parent; Sibling; Grandparent; Friend; Partner; Other (fill in the blank)
148. Have you tested positive for COVID-19? Yes and recovered; Yes and still sick but recovering; Yes and still have health challenges because of it; No
149. Do you have a physical disability that puts you at greater risk if you were to be diagnosed with COVID-19? Yes; No
150. Have any of the people listed below tested positive for COVID-19? (Check all that apply): Mother; Father; Sibling; Grandparent; Aunt/Uncle; Friend; Partner; Other (fill in the blank)
151. Do any of the people listed below currently have COVID-19? (Check all that apply): Mother; Father; Sibling; Grandparent; Aunt/Uncle; Friend; Partner; Other (fill in the blank)
152. Have any of the people listed below died from COVID-19 (Check all that apply): Mother; Father; Sibling; Grandparent; Aunt/Uncle; Friend; Partner; Other (fill in the blank)
153. Do any of the people listed below have a physical disability that puts them at a greater risk if they were to be diagnosed with COVID-19? (Check all that apply): Mother; Father; Sibling; Gra Friend; Partner; Other (fill in the blank)
APPENDIX D

STUDY DEBRIEF
Thank you for your time. This will conclude the study.

Please see the attached file for mental health resources

Mental Health Resources

DEBRIEF OF STUDY

The goal of the study is to collect data about undergraduate students’ experiences during the COVID era. Particularly, we are interested in what types of social support young adults have and their experiences consequential of COVID-19 that create stress. A lot of research suggests that exposure to stress can lead to increased symptoms of depression, which is a theory often referred to as the stress-diathesis model. In addition, the social support from various individuals, such as family, friends, significant others, peers, and faculty, is proposed to be protective against negative outcomes, such as poor physical and mental health. Taken together, we hypothesize that participants who report more stress and low social support will also report more symptoms of depression than individuals who report more social support and/or less stress. To study these constructs, we designed the current study:

![Diagram](image)

If you are interested in learning more about social support, stress, COVID-19 related stress, or the overall model of this study, please reach out to the main investigator Kathleen Kelly at kkelly8@niu.edu or review the references provided.
DeKalb County Resources

Campus Services

Counseling & Consultation Services, NIU (STUDENTS ONLY)

Phone: 815-753-1206
Address: Campus Life Building-200
Fees: None for counseling. Modest testing fees.
Hours: 8:00 a.m. – 4:30 p.m. Monday-Friday
Open whenever NIU is open, including breaks.
After Hours: Assistance after hours available by calling—815-753-1206

Description of Services: This service provides students with short-term, individual and group counseling for a broad range of personal concerns. Career counseling services include interest assessment, workshops, and use of computerized career counseling programs. Educational counseling services include assistance with test anxiety and study skills. Assessments of drug and alcohol abuse are also provided. First appointment scheduled with 3-7 days. (Handicapped Accessible).

Community Counseling Training Center, NIU

Phone: 815-753-9312
Address: 416 Graham Hall
Fees: None for students, faculty, or staff.
Hours: Call for available counseling hours.

Description of Services: A wide range of services are offered by the counselors including both personal and vocational counseling. In general, the approach used is one that promotes growth and focuses on increasing emotional well-being and self-awareness. All counselors are doctoral or masters level students who are being supervised by members of the counseling faculty. First appointments scheduled within 3-5 days.

The Couple and Family Therapy Clinic of NIU, NIU (formerly The Family Therapy Clinic)

Phone: 815-753-1684
Address: Wirtz Hall 146
Fees: The cost of services is determined by a sliding fee scale. No client is turned away due to the inability to pay. This gives clients of all income levels access to our high-quality care. Monday, Wednesday – 12 noon – 9:00 pm; Tuesday, Thursday - 9:00 am - 9:00pm; Friday - 9:00 am - 5:00 pm
Website: http://www.chhs.niu.edu/clinics/couple-family-therapy/index.shtml

Description of Services: The Couple and Family Therapy Clinic at NIU is a training and research facility that is an integral component of the specialization in Marriage and Family Therapy Program (SMFT). They provide clinical services to individuals, couples, and families with a unique perspective of addressing the issues in a larger systemic context. They follow rigorous training standards as set forth by our accrediting organization, being accredited by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE).

Psychological Services Center, NIU

Phone: 815-753-0591
Address: Psychology/Computer Science Building - Corner of Normal Rd and Lincoln Hwy.
Fees: $5 fee for therapy for students; Fee for assessments for students. Faculty, staff, and community members charged on a sliding scale.
Hours: Monday – 11:00 a.m. – 7:00 p.m.
Tuesday – 12:00 noon – 8:00 p.m.
Wednesday-Friday 9:00 a.m. to 5:00 p.m. Open whenever NIU is open, including breaks.

Description of Services: Individual, couples, family, and group psychotherapy, Intellectual, personality, and academic assessments. Clients are generally seen by advanced level graduate student staff under faculty supervision. Services tailored to meet a client's specific needs. First appointment scheduled with 7 days. (Handicapped accessible.)
Community Resources

Northwestern Medicine Ben Gordon Center - DeKalb
Phone: 815-756-4875
Address: 12 Health Services Dr., DeKalb, IL 60115
Fees: Sliding fee scales based on income. Insurance accepted.
Hours: Monday-Thursday: 8:00 a.m. – 8:30 p.m.
       Friday: 8:00 a.m. – 5:00 p.m.
After Hours: 866-242-0111 24/7 Hotline
Description of Services: Comprehensive counseling services to all residents of DeKalb County. Services to all persons affected by mental health problems, substance abuse, and family/child welfare concerns. 24-hour sexual assault/abuse services can be accessed through the Crisis Line. First appointment scheduled within 30 days. (Handicapped accessible and on Campus Bus Route).

Braden Counseling Center
Phone: 815-787-9000
Address: 2600 DeKalb Ave., Suite J, Sycamore, IL 60178
951 S. 7th St., Rochelle, IL 61068
Fees: Sliding fee scales based on income. Insurance accepted.
Description of Services: Free initial consultation. Specializes in counseling individuals, couples and families in various stages of life. Has flexible scheduling with Sycamore and Rochelle locations. Also offers a variety of evaluations, including same-day DUI evaluations, and legal and forensic work for attorneys.

Village Counseling
Phone: 815-517-0825
Address: 1211 Sycamore Rd., DeKalb, IL 60115
Fees: Sliding fee scales based on income. Insurance accepted.
Hours: Monday-9:00 a.m. - 10:00 p.m.
      Wednesday/Thursday-9:00 a.m. - 9:00 p.m.
      Friday-10:00 a.m. - 10:00 p.m.
Description of Services: Provides relationship-centered counseling, including life counseling for individuals, couples, families, adolescents, and children, as well as marriage and family counseling.

Family Service Agency, Center for Counseling
Phone: 815-758-8616
Address: 1325 Sycamore Rd. - DeKalb
Fees: $75.00 per visit. Insurance accepted, including NIU Student Insurance. Payment plans and scholarship funds available.
Hours: Monday-Wednesday-9:00 a.m. – 8:00 p.m.
       Thursday – Friday – 8:00 a.m. – 4:00 p.m. Additional hours available by appointment.
Description of Services: Individual, couple, group counseling for children, adults, senior citizens, and families. First appointment scheduled within 1-7 days. (Handicapped accessible and on Campus Bus Route).

Living Rite, The Center for Behavioral Medicine
Phone: 779-777-7335
Address: 1625 Bethany Rd., Sycamore, IL 60178
Fees: Based on insurance. Self-pay options are available.
Description of Services: Individual and Group Therapy. Therapy to deal with chronic pain.

Safe Passage, Inc.
Phone: 815-756-7930
Hotline/Crisis: 815-756-5228
Address: P.O. Box 621, DeKalb, IL 60115
Description of Services: A wide variety of services are offered to victims and perpetrators of domestic and sexual violence including crisis intervention and medical advocacy for victims of domestic and sexual violence, short- and long-term housing for victims and their children, counseling, legal advocacy, children’s services, community education, a batterer’s intervention program, and a Latina outreach program.
National Resources

Substance Abuse and Mental Health Services and Administration’s (SAMHSA’s) National Helpline
Phone: 1-800-662-HELP (4357)
Website: https://www.samhsa.gov/find-help/national-helpline
Description of Services: The hotline is a confidential, free, 24-hour-a-day, 365-day-a-year, information service, in English and Spanish, for individuals and family members facing mental and/or substance use disorders. This service provides referrals to local treatment facilities, support groups, and community-based organizations. Callers can also order free publications and other information.

The National Alliance on Mental Illness (NAMI) Helpline
Phone: 1-800-950-6264
Email: info@nami.org
Website: https://www.nami.org/help
Hours: Monday through Friday, 10 am – 6 pm, ET.
Description of Services: A free, nationwide peer-support service providing information, resource referrals and support to people living with mental health conditions, their family members and caregivers, mental health providers and the public.

National Suicide Prevention Lifeline
Phone: 1-800-273-8255
Website: https://suicidepreventionlifeline.org
Description of Services: The Lifeline provides 24/7, free and confidential support for people in distress, prevention and crisis resources for people or their loved ones, and best practices for professionals. They offer both over the phone or online chat services.
APPENDIX E

COVID-19 RELATED STRESS SCALE PATTERN MATRIX

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Low stress</td>
</tr>
<tr>
<td>P2</td>
<td>Moderate stress</td>
</tr>
<tr>
<td>P3</td>
<td>High stress</td>
</tr>
<tr>
<td>Factors and Items</td>
<td>1</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>----</td>
</tr>
<tr>
<td><strong>Fear of Virus</strong></td>
<td></td>
</tr>
<tr>
<td>I am afraid of the coronavirus (COVID-19).</td>
<td>-0.894</td>
</tr>
<tr>
<td>I am stressed around other people because I worry I'll catch the coronavirus (COVID-19).</td>
<td>-0.906</td>
</tr>
<tr>
<td>Thinking about the coronavirus (COVID-19) makes me feel threatened.</td>
<td>-0.863</td>
</tr>
<tr>
<td>How concerned are you that you'll be infected with the coronavirus (COVID-19)?</td>
<td>-0.848</td>
</tr>
<tr>
<td>I am worried that my friends might get sick</td>
<td>-0.583</td>
</tr>
<tr>
<td>I am worried that my family might get sick.</td>
<td>-0.534</td>
</tr>
<tr>
<td><strong>Economic Hardship</strong></td>
<td></td>
</tr>
<tr>
<td>The coronavirus (COVID-19) has impacted me negatively from a financial point of view.</td>
<td>0.569</td>
</tr>
<tr>
<td>I have lost a job, or related income, due to the coronavirus (COVID-19).</td>
<td>0.809</td>
</tr>
<tr>
<td>I have had a hard time getting needed resources (i.e., food) due to the coronavirus (COVID-19).</td>
<td>0.756</td>
</tr>
<tr>
<td>It has been difficult for me to get the things I need due to the coronavirus (COVID-19).</td>
<td>0.639</td>
</tr>
<tr>
<td>I have had a hard time getting a job.</td>
<td>0.752</td>
</tr>
<tr>
<td>I am concerned about increased family conflict</td>
<td>0.349</td>
</tr>
<tr>
<td><strong>Social Isolation</strong></td>
<td></td>
</tr>
<tr>
<td>I have felt socially isolated as a result of the coronavirus (COVID-19).</td>
<td>-0.807</td>
</tr>
<tr>
<td>Over the past two weeks, my life routines have been affected by the coronavirus (COVID-19) situation.</td>
<td>-0.872</td>
</tr>
<tr>
<td>What is the extent to which sheltering in place has negatively affected your relationships with others?</td>
<td>-0.653</td>
</tr>
<tr>
<td><strong>Missing Events</strong></td>
<td></td>
</tr>
<tr>
<td>I have missed school events, activities, and sports (e.g., clubs, sports)</td>
<td>0.798</td>
</tr>
<tr>
<td>I have missed events that were important to me (e.g., Greek life Rush, orientation).</td>
<td>0.716</td>
</tr>
<tr>
<td>I have missed going to community events (e.g., church, festivals).</td>
<td>0.782</td>
</tr>
<tr>
<td>I have missed other non-school social activities (e.g., concerts, social outings).</td>
<td>0.816</td>
</tr>
<tr>
<td><strong>Academic Stress</strong></td>
<td></td>
</tr>
<tr>
<td>I have had a hard time concentrating on schoolwork</td>
<td>0.920</td>
</tr>
<tr>
<td>I have had a hard time being motivated to do schoolwork</td>
<td>0.903</td>
</tr>
<tr>
<td>I am stressed about falling behind on schoolwork</td>
<td>0.875</td>
</tr>
</tbody>
</table>

*Note: Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.*