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STRESS AND SUBJECTIVE WELL-BEING AMONG ONLINE COLLEGE STUDENTS:
EXAMINING THE ROLE OF SOCIAL SUPPORT

By
Angela Robinson

A Dissertation

Submitted in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Philosophy

Major: Educational Psychology and Research

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Dedication

This manuscript is dedicated to all my students
(past and present) who continually remind me
why I chose a career in higher education.

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There are many people responsible for helping me through my doctoral studies and this dissertation project. First and foremost, I would like to thank my spouse, Joe Martin, for his endless love and support throughout this process. You believed in me when I did not believe in myself, and you encouraged me to continue when I wanted to quit. Thank you for your unwavering commitment to me and this journey over the past six years. I look forward to sharing more “free time” together in our post-doctoral life.

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Abstract

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The purpose of this study was to examine the relationship between stress and well-being among online undergraduate college students, and to explore the role of social support as a potential moderator in this relationship. This study utilized cross-sectional survey data collected from 175 undergraduate students enrolled exclusively in online courses during the spring 2021 semester at an urban, public university in the midsouth US. Roughly 65% of the sample was comprised of nontraditional-aged students, those 24 years and older. A series of MANOVAs revealed statistically significant differences in perceived stress and social support across age, gender, and race. Regression results revealed that perceived stress and social support account for 36% of the variance in online college students' well-being, with additional evidence suggesting that social support functions as a main effect and not a buffering effect on the well-being of these students. Significant findings of this study highlight the diverse perspectives of stress and support among online college students and draws attention to the impact of stress and support on online students' subjective well-being. This study provides practical implications for higher education professionals and theoretical implications for how social support may function among online undergraduate college students.

Keywords: stress, social support, subjective well-being, college students, online students, undergraduate students

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CHAPTER 1

Introduction

Advances in information technologies have impacted every aspect of our lives including education, specifically launching widespread growth in postsecondary online degree programs. Over the past two decades new innovations have challenged conventional thoughts about higher education and have expanded opportunities for degree completion through online learning platforms. What was once a new concept is now commonplace, as online courses are offered to some extent in most universities and fully online degree programs are easier to access now than ever before.

Trends in Online Enrollment

While overall higher education enrollment has remained stagnant in the US for the past several years (Legon & Garrett, 2017), enrollment in online degree programs has steadily increased, creating new competitiveness in the higher education marketplace. It seems online education is not a fleeting trend, but rather a long-term strategy for growth. According to a 2017 report by Quality Matters, “ninety-five percent of [chief online officers] perceive a ‘much more’ competitive fully online program market compared to five years ago and [they] also indicated plans to launch more online programs in the next one to three years” (Legon & Garrett, 2017, p. 7). As forecasted in Legon and Garrett’s 2017 report, colleges and universities have reported staggering increases in their online enrollment over the past three years. In fall 2018, over 16.6 million college students were enrolled at the undergraduate level and 34.5% (5.7 million) of those students participated in at least one online course (National Center for Education Statistics, 2020). Over 2.3 million students, 14 percent of the total undergraduate enrollment, were enrolled exclusively in online courses (National Center for Education Statistics, 2020).

Local data from the University of Memphis is aligned with these national reports. During fall 2018, the University of Memphis reported 17,233 students enrolled at the undergraduate level with 43.5% (7,499) enrolled in at least one online class and 10.8% (1,871) enrolled exclusively in online classes (University of Memphis, 2020). Reports from each subsequent year have revealed a consistent upward trajectory for online enrollment. During the fall 2019 semester, 17,378 students were enrolled at the undergraduate level with 46.5% (8,089) enrolled in at least one online class and 11.6% (2,009) enrolled exclusively in online classes. That is a 7.8% increase in partial online enrollment and a 7.4% increase in exclusive online enrollment between fall 2018 and fall 2019 (University of Memphis, 2020).

This upward trajectory was accelerated after fall 2019 as the COVID-19 pandemic made its way to the United States. The pandemic created unique circumstances for higher education and, like many other industries, forced institutions to adapt to meet their students' needs while also protecting their health. Due to the mode of transmission and high infection rates, governments recommended a nationwide self-quarantine and encouraged colleges to temporarily discontinue all on-campus services. By March 2020, most schools moved face-to-face classes to online formats, and many remained exclusively online through the summer semester. Some colleges chose to reopen on-campus classes and services for the fall 2020 semester but promptly closed again due to spikes in reported COVID-19 cases. Although the University of Memphis allowed students to register for on-campus classes for the fall 2020 semester, they opted for a phased reopening which would ultimately limit students and instructors from returning to campus. The University of Memphis's fall 2020 census report revealed 17,373 total students enrolled at the undergraduate level with 49.7% (8,631) enrolled in at least one online class and 15.4% (2,672) enrolled exclusively in online classes (University of Memphis, 2020). That is a

6.7% increase in partial online enrollment and a staggering 33% increase in exclusive online enrollment between fall 2019 and fall 2020. While overall undergraduate enrollment remained stable between fall 2018 and fall 2020, there has been a 15.1% increase in partial online enrollment and 42.8% increase in exclusive online enrollment during this two-year period (University of Memphis, 2020). These data reveal that not only are more students choosing to move some of their classes online, but the largest growth is among those who are choosing to take classes exclusively online.

These enrollment trends from the University of Memphis mirror the upward trend seen in nationwide online enrollment, especially among students seeking to enroll exclusively online. The COVID-19 pandemic will eventually dissipate from the headlines but the desire for quality online education is not likely to slow down. Therefore, it is important to gain a deeper understanding of online students' experiences so that institutions of higher learning can meet the needs of this diverse population.

Challenges in Online Learning

While online learning provides greater access and affordability to higher education, it may also create a new source of stress for college students. For instance, online courses commonly utilize text heavy communication platforms lacking in instant feedback which may stifle meaningful connections, slow down the teaching-learning process, and create a sense of isolation. This sense of isolation can lead to increased stress and anxiety. In the 2019 annual report of the Center for Collegiate Mental Health, anxiety was indicated as the most common mental health concern among college students (Center for Collegiate Mental Health, 2020). It seems the COVID-19 pandemic has only exacerbated this concern. In a study by Son et al. (2020), 71% of college students reported increases in stress and anxiety due to the pandemic. Of

these students, 82% reported increases in concerns surrounding academic performance, with the biggest perceived challenge being the transition to online classes (38% of responses). In an effort to cope with the increased stress and anxiety, many participants indicated seeking support from others. Roughly one-third of the students mentioned seeking support from family and friends as a primary way to deal with stress and anxiety (Son et al., 2020).

Past studies indicate that challenges college students experience in their education may increase when they perceive a lack of social support (Park & Choi, 2009). College students with lower quality social support are more likely to experience mental health problems than students with high quality social support (Hefner & Eisenberg, 2009). Researchers suggest that a strong sense of social support may enhance college students' well-being, and even protect against the negative effect of stress. Although many researchers have explored the role of social support on various psychosocial outcomes, few have examined the impact of social support specifically among online college students. As the demand for online learning continues to grow across a diverse population, it is increasingly important to gain a better understanding of the stress and support that impact these students' well-being.

Purpose of the Study

Guided by Lakey and Cohen's (2000) theoretical perspectives of social support and Cohen and Wills' (1985) models of social support, this study utilized a correlational research design to examine the role of social support in the relationship between stress and subjective well-being among online undergraduate college students. Results from this study provide both practical implications for higher education professionals and theoretical implications for future research.

CHAPTER 2

Literature Review

Introduction

This chapter includes a review of theoretical literature and empirical evidence that frames the scope of this study. Lakey and Cohen's (2000) theoretical perspectives of social support and Cohen and Wills' (1985) hypothesized models of social support build the theoretical framework for this study. Then a critical review of relevant empirical literature was utilized to contextualize these concepts and provide support for the relationships between variables and the research topic. Together, the theoretical and empirical literature serve to inform and guide the direction of this study.

Theoretical Framework

The concept of social support has been used extensively in theoretical and empirical literature but until recently there were inconsistencies among scholars regarding the definition of social support. Literature from the past four decades provides a vast array of definitions focused on a variety of aspects of support such as support network resources, incidences of support, supportive behaviors, appraisals of support, and types of support. Most of the definitions were just working assumptions about the concept of social support so they were intentionally left vague, and many scholars claimed one definition would not be suitable due to the multifaceted nature of the concept (Hupcey, 1990). However, most of the theoretical definitions of social support have included one or more aspect of these three categories: (1) the action of providing a resource, (2) description of outcomes of support that include a sense of positive well-being, and (3) a description of the relationship between the source of support and the recipient (Hupcey, 1990).

Scholars have found the global perception of social support is a better indicator of outcome variables than actual received social support (Cohen & Wills, 1985; Wethington & Kessler, 1986). This is to say that what really matters is if an individual perceives there to be an adequate amount of support available for them to use, regardless of observable acts of support. Shumaker & Brownell's (1984) definition of social support will be used to guide the conceptualization and operationalization of social support in this study. Then Lakey and Cohen's (2000) theoretical perspectives of social support and Cohen and Wills' (1985) models of social support will be used to further examine the mechanisms by which social support impacts well-being.

Defining well-being

First, it is important to define well-being since it is used frequently as an outcome variable when examining the role of social support. Subjective well-being is a multidimensional construct and in much of contemporary research well-being is understood in terms of three major components: life satisfaction, positive affect, and negative affect. According to Diener (2000), life satisfaction refers to "people's cognitive and affective evaluations of their lives" (p. 34). This evaluation is often compared to a self-imposed set of standards, and if the two are relatively similar then the individual reports a high level of life satisfaction. Since life satisfaction is not externally imposed, it is a subjective measure of one's own judgements and tends to be relatively stable over time (Pavot & Diener, 1993).

Defining social support

Shumaker & Brownell (1984) propose a conceptual approach to social support and state that it can be understood as, "an exchange of resources between at least two individuals perceived by the recipient to be intended to enhance the well-being of the recipient" (p. 13). This

conceptual approach to social support emphasizes the interpersonal exchange of resources, which may be emotional (empathy, encouragement, concern), informational (advice, feedback, assistance solving problems), or instrumental (practical help and tangible resources) in nature. Additionally, this approach emphasizes the exchange between at least two individuals with the intention to enhance well-being. This speaks to the assumption of on-going relationships within a social network. Social support can be provided from a variety of individuals to include family members, friends, and significant others. While support may be communicated through various behaviors, the offer of resources alone does not constitute social support. An individual's perception of having someone to provide these resources, and that the resources are adequately available, is what distinguishes this conceptualization of social support.

Shumaker & Brownell's (1984) conceptual approach to social support is useful in providing a framework for understanding the importance of an individual's perception of social support but they do not provide additional information regarding the function of support on well-being. Lakey and Cohen's (2000) theoretical perspectives of social support offer explanations of the possible mechanisms by which social support impacts well-being.

Mechanisms of social support

The function of social support has been widely discussed by scholars and there appears to be two primary possibilities for how social support impacts well-being: through intrapersonal mechanisms and interpersonal mechanisms. Lakey and Cohen (2000) present two primary theoretical perspectives on social support research: (1) the social cognitive perspective and (2) the stress and coping perspective. These perspectives, or research traditions, have been used widely to examine the intrapersonal and interpersonal mechanisms by which social support impacts health and well-being.

Social cognitive perspective. The social cognitive perspective proposes an intrapersonal mechanism by which social support impacts well-being, suggesting that social support functions by promoting a strong sense of self (Lakey & Cohen, 2000). This perspective is grounded in pragmatic philosophy and social psychology. Early research by Dewey (1917) and Mead (1934) proposed that reality is a social construction, referring to the assumption that individuals build concepts about the world based on their social context. Therefore, this perspective links the self and the social world. For instance, if an individual believes they are accepted, valued, and cared for by others who are willing to do anything within their means to help, then the individual may feel as though they have positive attributes that elicit these responses (Sarason, Sarason, & Pierce, 1990). A general perception that one is cared for and valued can become integrated into an individual's personality (Lakey & Heller, 1988) and can lead to an increased sense of self, which may increase subjective well-being.

Stress & coping perspective. The stress and coping perspective proposes an interpersonal mechanism by which social support impacts well-being, suggesting that social support functions by serving as a protection against the adverse effects of stress (Lakey & Cohen, 2000). Stress is commonly referred to as one's physical and psychological response to an actual or perceived threat (Long, 1998). The threat itself is referred to as a stressor, an individual's evaluation of the stressor is referred to as their appraisal, and an individual's response to dealing with a stressor is referred to as coping (Long, 1998). The buffering effect of social support is hypothesized to be found when there is a strong stressor present, to which individuals must appraise the availability and adequacy of resources within a social network. The perception of sufficient social support may influence individuals' appraisals of threatening events as being less stressful, which minimizes the negative effect of the stressor on the

individual's well-being. This perspective is also linked with stress and coping theories (Lazarus & Folkman, 1984) suggesting that perceived social support may enhance positive coping strategies during stressful events, further enhancing well-being (Cicognani, 2011).

Following Lakey and Cohen's (2000) theoretical perspectives, the impact of social support on well-being can be understood through two mechanisms. Numerous studies have examined these relationships and provide evidence of how social support functions to impact the well-being of college students. Two corresponding models are presented and include relevant empirical literature that inform the context and direction of this study.

Models of Social Support

Many studies have shown that social support is linked to the well-being of college students, but the mechanisms through which support impacts well-being has various explanations. Early work by Cohen and Wills (1985) provides evidence of a main effect model and a buffering effect model of social support. The main effect model suggests that social support has a direct, beneficial impact on well-being. The buffering effect model suggests that social support impacts well-being primarily for individuals who are under stress, with social support protecting against the potential pathogenic influence of stressors (Cohen & Wills, 1985). Following the theoretical perspectives of Lakey and Cohen (2000), these models do not contradict one another but instead offer different explanations for how social support functions to impact well-being. There is reason to believe that both models are valid, as evidence can be found in the literature to support both models.

Main effect model

Cohen and Wills' (1985) main effect model was constructed to test the hypothesis that social support has a generalized beneficial impact on well-being. Cohen & Wills (1985) propose

that this effect could occur because social networks provide individuals with positive experiences that positively impact well-being, either through positive affect or through increased self-worth. The conceptualization of this model is further supported by Lakey and Cohen's (2000) social cognitive perspective of social support, suggesting that perceptions of social support improve perceptions of the self, thus impacting well-being. Past studies provide empirical evidence that supports this hypothesized association between social support and the self, finding positive relationships between social support and self-esteem (Friedlander et al., 2007; Narayanan & Onn, 2016), self-regulation (Williams et al., 2019), and self-efficacy (Chu, 2010; Coffman & Gilligan, 2002; Dwyer & Cummings, 2001).

Buffering effect model

While the main effect model hypothesizes a direct, positive association between social support and well-being, the buffering effect model was constructed to test the hypothesis that social support impacts well-being primarily for individuals who are under stress, with social support protecting against the potential pathogenic influence of stressors. Lazarus and Launier (1978) posit that stress occurs when an individual appraises an event as threatening and does not possess an appropriate coping response to address the event. Appraisals of stress can include outcomes such as negative affect, increased physiological responses, and behavioral changes (Cohen & Wills, 1985). While a single stressful event may not create significant demands on an individual's coping abilities, it is the persistence of multiple problems that accumulate to strain an individual's response to stress. The perceived failure to adequately respond to persistent stress can potentially cause negative psychological outcomes such as feelings of helplessness and low self-esteem (Cohen & Wills, 1985). Cohen and Wills' (1985) buffering effect model is representative of Lakey and Cohen's (2000) stress and coping theoretical perspective of the

buffering mechanism of social support. This suggests that social support impacts well-being by buffering against the negative effects of stress.

Social Support Among College Students

Psychometric evidence suggests that perceived social support is a better predictor of well-being than actual received support (Szkody & McKinney, 2019; Wethington & Kessler, 1986). This goes to say that if an individual does not perceive support to be available then they are not likely to use it, even if it is offered by others. There is substantial empirical evidence supporting positive associations between perceived social support and well-being outcomes among college students to include improved social adjustment (Rosenfeld et al., 2000; Swenson et al., 2008) and greater life satisfaction (Siedlecki et al., 2013). Studies of first-year college students have indicated that social support positively impacts life satisfaction, further suggesting that students who are satisfied with their support networks report higher levels of life satisfaction (Demakis & McAdams, 1994), lower levels of homesickness (Newland & Furnham, 1999), and greater psychosocial and academic adjustment to college (Halamandaris & Power, 1999). In a study by Coffman & Gilligan (2002), stress and social support accounted for 41 percent of the variance in life satisfaction of college students, with social support providing the largest contribution.

Sources of social support

Social support is derived from a variety of supportive behaviors offered by many individuals within a social network. The literature suggests that the source of support (family, friends, significant others) may be an important factor to consider when reviewing well-being outcomes of college students (Diener & Fujita, 1995), as different sources of support may have varying impacts on well-being. Some studies have shown that family support is linked with academic success (Cutrona et al., 1994), better coping strategies (Cicognani, 2011), lower levels

of loneliness (Mounts et al., 2006), higher quality of life (Roming & Howard, 2019), and greater emotional adjustment to college (Montgomery & Cote, 2003). Other studies suggest that emotional support from peer relationships is linked to a reduction in loneliness and stress during the transition to college (Buote et al., 2007; Mattanah et al., 2010) and friendships with college peers showed to enhance students' sense of belonging while improving their ability to cope with the challenges and demands of college (Buote et al., 2007; Hoffman et al., 2002). Other findings show that sources of school-related social support, such as teachers and classmates who interact with students most frequently in the academic setting, may provide different influences on well-being. For instance, Kim et al. (2011) found that social support is negatively correlated with student burnout, with school and teacher support serving a more significant role than peers and parents.

Social support across demographics

A review of the literature summarizes that support from parents, teachers, and peers is more critical for the well-being of traditional college students, whereas nontraditional students may receive more beneficial effects from support by spouses and family (Zembylas, 2008). Nontraditional students tend to be older in age and have diverse backgrounds which may necessitate the need for different types of support to help balance demands between work, family, and school.

Similarly, social support seems to also have a positive impact among minority student groups. Albright and Hurd (2018) found that social support has a positive impact on the well-being of underrepresented college students (first-generation, students from disadvantaged economic backgrounds, and/or members of historically underrepresented racial/ethnic groups) but these authors noted that this population may require greater levels of support to achieve a

healthy transition to college. Similarly, Solberg and Villarreal (1997) found that social support was associated with decreased distress among Hispanic college students.

Stress Among College Students

College years can be a particularly stressful time and are often marked by stressors that include loneliness, separation from friends and family, academic demands, relationship conflicts, financial problems, and personal health (Deatherage et al., 2014). The American College Health Association (2018) reported that most college students were troubled by stress and identified stress as a primary concern impacting academic performance. Past studies have shown that stress is a recurring problem for college students and has been associated with indicators of negative psychological well-being such as depression and anxiety (Acharya et al., 2018; Deatherage et al., 2014; Eisenbarth, 2019), poor adjustment (Brougham et al., 2009; Solberg & Villarreal, 1997), maladaptive coping strategies (Dwyer & Cummings, 2001; Lyrakos, 2012), and low life satisfaction (Demakis & McAdams, 1994; Karaman et al., 2017).

Across student groups, researchers have found that social support serves to protect individuals from perceived stress, with stress among college students decreasing when social support increases (Chao, 2012; Green et al., 2012; Wright et al., 2014) and life satisfaction improves as social support increases (Chao, 2011, 2012). Researchers have also emphasized the link between social support and reduced depression (Butler & Randall, 2013; Marroquín, 2011; Rueger et al., 2016), suggesting that mental health outcomes are better among individuals with greater perceived social support. Multiple studies (Chao, 2011; Chao, 2012) found that social support moderated stress on well-being by enhancing problem-solving coping strategies and decreasing dysfunctional coping.

Stress across demographics

The literature suggests that different student groups may report different levels of perceived stress. This is important to consider since it impacts how individuals appraise and cope with events that are perceived as stressful and may impact the buffering effect of social support on well-being outcomes. For instance, Acharya et al. (2018) found that female students reported higher levels of stress than male students. Similar results were found by Karaman et al. (2017), who reported female college students indicated higher levels of academic stress than male college students. Alternatively, Eisenbarth (2019) found that women and men reported similar levels of stress but there were significant differences in their disposition to seek support in coping with their stress. Although the underlying reasons for these gender differences is unclear, it seems as though there may be gender differences in college students' perceptions of and responses to stress.

Stress and Support in the Online Context

While there are many terms used to describe online learning (distance learning, open learning, web-based learning, computer-mediated learning), the most common definition of online learning is when course material and instruction occurs entirely online, either synchronous or asynchronous (Allen & Seaman, 2013; Kaufman, 2015; Singh & Thurman, 2019). As described by Joyner et al (2020), synchronicity refers to the degree to which students and instructors are connected in the classroom. Some courses, such as massive open online courses (MOOCs), have open enrollment and floating deadlines so that students can work at their own pace. These courses are entirely asynchronous. More commonly among universities are online courses that allow students to follow the same schedule but do not require them to meet virtually at specified times. These can be described as having cohort synchronicity but are

instructionally asynchronous. Alternatively, synchronous online courses have required virtual meeting times where students interact in real-time with each other and the instructor.

Online learning can be done anywhere with an Internet connection, and at any time if courses are asynchronous, so it provides a high level of flexibility for students but may also create an isolated learning environment. Face-to-face instruction allows the instructor to gauge students' level of understanding, address questions in real-time, provide immediate feedback, and allows for student collaboration (Legon & Garrett, 2017). Synchronous online classes are similar to on-campus classes in that they allow students to attend live lectures and interact with the instructor and classmates in real-time. However, approximately ninety five percent of online programs with more than 2,500 students are entirely asynchronous (Legon & Garrett, 2017).

Stress among online students

Asynchronous online learning environments present unique challenges, particularly surrounding engagement, community, and support (Gillett-Swan, 2017). Asynchronous classes lack instant feedback and depend almost entirely on written communication (Littlefield, 2018), which can hamper learner-instructor interaction and slow down the teaching–learning process (Favale et al., 2020). This extends to peer-peer interactions, as Bianchi-Laubusch (2016) found that 42% of online students in a large asynchronous online program reported not having an opportunity to communicate with their peers. This computer-mediated communication is common in asynchronous classes and creates muted interactions in the online learning environment, causing online students to feel isolated from their peers and instructors (Rakes & Dunn, 2010). This sense of isolation can lead to increased stress and anxiety. The feelings of isolation and loneliness can have negative effects on course persistence, academic performance, and psychological well-being (Gillett-Swan, 2017). Researchers have recommended social

support as a possible intervention to positively impact well-being and offset the negative effects of stress among online college students.

Social support among online students

Online undergraduate college students tend to be older than traditional students and often have more responsibilities outside of school associated with work and family responsibilities (Jarvie-Eggart et al., 2019; Johnson, 2019; Kummerow et al., 2012). Past studies have indicated emotional support had a greater association with persistence among online learners (Chu, 2010; Holder, 2007). While emotional support can come from a variety of sources, researchers suggest that family support is critical for online learners (Chu, 2010). Family support can provide important assistance through helping to create a balance between family and academic responsibilities (Zembylas, 2008), and a lack of family support may enhance domestic challenges already experienced by adult students (Willging & Johnson, 2009; Zembylas, 2008). Institutional support has also been shown to serve an important role for online students. Zembylas (2008) found that a lack of communication between students and instructors led to feelings of isolation. Similarly, other studies found that adult online students need both technological support (Erickson & Noonan, 2010; Nor, 2011) and pedagogical support (Dumais et al., 2013). These types of institutional support have been shown to predict dropout among online college students (Park & Choi, 2009) indicating a need for institutional support from faculty and administrators.

Current Study

The purpose of this study was to examine the relationship between stress and well-being among online undergraduate college students, and to explore the role of social support in this relationship. Shumaker & Brownell's (1984) definition of social support emphasizes an exchange of resources with the intention of enhancing well-being. The mechanisms by which

social support impacts well-being can be explained by Lakey and Cohen's (2000) theoretical perspectives of social support, which suggest intrapersonal and interpersonal effects. These effects have been tested using Cohen and Wills' (1985) hypothesized models of social support: the main effect model and the stress buffering model.

Past studies have shown that social support has a direct, positive impact on well-being and serves to buffer the negative effects of stress on well-being. While many scholars have found evidence of these relationships among college students, few have examined these models specifically among online college students. Online college students are typically working adults who juggle the demands of their career and family while also continuing their education. Online students have reported different perceptions of stress and support than their on-campus peers and therefore may benefit from different sources of support. This study examines the mechanisms by which social support impacts the subjective well-being of online college students.

CHAPTER 3

Method

Introduction

The purpose of this study is to examine the relationship between stress and subjective well-being among online undergraduate college students, and to explore the role of social support in this relationship. The following research questions were examined:

- (1) Are there demographic differences (gender, age, race) in perceived stress and perceived social support among online undergraduate colleges students?
- (2) How does perceived stress and perceived social support impact the subjective well-being of online undergraduate college students?
- (3) Does each source of social support (family, friends, significant others) have a different impact on the subjective well-being of online undergraduate college students?

This chapter describes the study research design, sample, survey instrument, data collection, and data analyses.

Research Design

Guided by Lakey and Cohen's (2000) theoretical perspectives of social support and Cohen and Wills' (1985) models of social support, this study utilized a correlational research design to examine how social support functions to impact the well-being of online undergraduate college students.

Sample

A convenience sampling strategy was used for this study. Convenience sampling is a type of nonprobability sampling that recruits participants based on convenience of access, availability, and willingness to participate. Participant eligibility for this study required enrollment in online

undergraduate courses at the University of Memphis during the spring 2021 semester. A list of eligible participants was generated by the Director of University of Memphis's Global campus and only included students' first name and university e-mail address.

An a-priori power analysis was conducted using G*Power Version 3.1 software (Faul et al., 2007) to secure an adequate sample size that would provide reliable and valid statistical results and statistical power. Statistical power refers to the likelihood that the study will find an effect when there is indeed an effect to be found, decreasing the odds of a Type II error. Based on recommendations by Hinkle, Wiersma, and Jurs (2003), a medium power (.80) and a conventional level of significance (.05) were assumed using ten predictor variables, according to the largest regression model in this study. Based on these criteria, the G*Power software suggested a minimum sample size of 118 was needed to detect a moderate effect size ($f^2 = .15$) for this study.

Participants. The total sample included 178 students enrolled exclusively in online classes during the spring 2021 semester. This sample of students identified predominantly as female (81.5%, $n=145$) and were racially diverse with 50% ($n=89$) identifying as white, 37.1% ($n=66$) African American, 4.4% ($n=8$) multi-racial, and 3.9% ($n=7$) Hispanic. The distribution of racial groups from this sample of online students reflects the overall undergraduate population of this university during the same semester. The age range of these students was 19 to 64 with a mean age of 33.87. Roughly 65% of the sample were nontraditional-aged college students, those aged 25 years and older (Horn, 1996). Nearly 57% of the students were enrolled in part-time hours during the spring semester, 87% indicated this was not their first semester enrolled in online classes and 85% indicated they plan to complete their degree online. It is also notable that nearly 62% of the students indicated working full-time while enrolled in classes and when asked

about their parents' level of education, over 65% of the sample identified as first-generation college students.

Instrument

Based on theoretical and empirical literature, an online survey instrument was constructed to examine perceived stress, perceived social support, and subjective well-being of online college students. Participants completed 51 total survey items regarding their (1) demographic information, (2) enrollment information, (3) perceptions of stress, (4) perceptions of social support, and (5) subjective well-being. The following sections will define these variables and indicate how they were measured in this study.

Demographic variables

Demographic information was collected and used to test for group differences across gender, age, and race.

Perceived stress

Stress is commonly referred to as one's physical and psychological response to an actual or perceived threat (Long, 1998). In this study, stress was measured using the Perceived Stress Scale. The Perceived Stress Scale (PSS-10) was developed by Cohen et al. (1983) and contains 10 items used to measure the degree to which participants appraise circumstances in their lives as being stressful. The PSS-10 was chosen for this study because it was designed to be a global measure of stress and is used to assess the degree to which participants see their lives as uncomfortable, unpredictable, or burdened by stressors (Cohen et al., 1983). Survey items measure frequency of stressful situations in the past month and are answered on a 5-point Likert Scale (0 = *never* and 4 = *very often*), with higher scores indicating higher levels of perceived stress. Survey items include "In the last month, how often have you felt nervous or stressed," "In

the last month, how often have you felt confident about your ability to handle your personal problems,” and “In the last month, how often have you found that you could not cope with all the things that you had to do”. Four of the ten scale items (4, 5, 7, 8) are stated positively so they were reversed coded before all scale items are summed for a total score. An exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) of the PSS-10 among a sample of college students indicated a two-factor structure (perceived helplessness and perceived self-efficacy) was more dominant than a one-factor structure, and the factors combined accounted for 61.9% of the variance (Roberti et al., 2006). Among a sample of undergraduate college students, Roberti et al. (2006) reported a Cronbach’s alpha reliability of .89 for the total score of the 10 items, an alpha of .85 for the 6 items measuring perceived helplessness, and an alpha of .82 for the 4 items measuring perceived self-efficacy. Similarly, a more recent study of undergraduate college students by Eisenbarth (2019) reported a Cronbach’s coefficient of .85 for all 10 items, further suggesting strong internal reliability for this scale when used among this population. Researchers have found that higher scores on the PSS-10 among college students were positively associated with depressive symptoms (Cohen et al., 1983), negative affect (Civitci, 2015), dysfunctional coping strategies (Chao, 2011; Lim et al., 2013), and poor academic performance (Gabre & Kumar, 2012).

Perceived social support

Theoretical and empirical literature suggests that general beliefs about supportiveness are more predictive of well-being outcomes than actual received support (Lakey & Cohen, 2000). In this study, perceived social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS was developed by Zimet et al. (1988) and contains 12 items used to measure the subjective assessment of social support from family, friends, and

significant others. Survey items are measured on a 7-point Likert Scale (1 = *very strongly disagree* and 7 = *very strongly agree*), with higher scores indicating higher levels of perceived social support. Survey items include “I get the emotional help and support I need from my family,” “I can count on my friends when things go wrong,” and “I have a special person who is a real source of comfort to me.” Individual scores of the 12 items are summed for a total score measuring overall perceived social support. Total scores from 12–48 indicate low social support, scores from 49–68 indicate moderate social support, and scores from 69–84 indicate high social support (Zimet et al., 1988). A confirmatory factor analysis (CFA) of the MSPSS among a sample of urban adolescents indicated a three-factor solution for the MSPSS: social support from family, friends, and significant others, and the factors combined accounted for 79% of the variance (Canty-Mitchell & Zimet, 2000). Similarly, Ermis-Demirtas et al. (2018) conducted a CFA among a sample of college students and confirmed the three-factor solution. In a study of undergraduate college students, Jenkins et al. (2011) reported a MSPSS Cronbach’s coefficient of .88, suggesting strong internal reliability. Their study also suggested good internal reliability within the MSPSS subscales of family ($\alpha = .93$), friends ($\alpha = .94$), and others ($\alpha = .95$). Researchers have found that higher scores on the MSPSS in studies among college students were positively associated with better life satisfaction (Jenkins et al., 2011), fewer depressive symptoms (Jenkins et al., 2011; Szkody & McKinney, 2019), and greater positive affect (Civitci, 2015).

Subjective well-being

Subjective well-being is a multidimensional construct and in much of contemporary research well-being is understood in terms of three major components: life satisfaction, positive affect, and negative affect. According to Diener (2000), life satisfaction refers to “people’s

cognitive and affective evaluations of their lives” (p. 34). This evaluation is often compared to a self-imposed set of standards, and if the two are relatively similar then the individual reports a high level of life satisfaction. Since life satisfaction is not externally imposed, it is a subjective measure of one’s own judgements and tends to be relatively stable over time (Pavot & Diener, 1993). In this study, subjective well-being was measured using the Satisfaction with Life Scale (SWLS). The SWLS was developed by Diener et al. (1985) and contains 5 items used to measure the cognitive judgmental aspect of subjective well-being. Survey items are measured on a 7-point Likert Scale (1= *strongly disagree* and 7 = *strongly agree*), with higher scores indicating higher levels of subjective well-being. Survey items include “I am satisfied with my life,” “So far I have gotten the important things I want in life,” and “If I could live my life over, I would change almost nothing.” Individual scores of the 5 items are summed for a total score. An exploratory factor analysis (EFA) of the SWLS among a sample of undergraduate college students indicated a single-factor solution, which accounted for 66% of the variance (Diener et al., 1985). Diener et al. (1985) also found the SWLS was moderately to highly correlated with other scales of subjective well-being, to include the Cantril’s (1965) Self-Anchoring Ladder, Andrews and Withey’s (1976) D-T scale, Fordyce’s (1978) single-item measure of happiness, Bradburn’s (1969) Affect Balance Scale, and Tellegen’s (1979) well-being subscale of the Differential Personality Questionnaire. In a study of undergraduate college students, Karaman et al. (2017) reported a SWLS Cronbach’s coefficient of .84, suggesting strong internal reliability. Researchers have found that higher scores on the SWLS among college students were associated with greater academic achievement and retention (Frisch et al., 2005), lower academic stress (Kaya et al., 2015), lower depressive symptoms (Jenkins et al., 2011), and greater self-efficacy (Ojeda et al., 2011).

Data Collection

Once IRB approval was received, an anonymous link was generated using Qualtrics software and distributed to all enrolled online undergraduate students at the University of Memphis, via university e-mail. The survey could be accessed by any device with Internet connectivity and took 5-10 minutes to complete. Participants had one week (7 days) to access and complete the survey. The sample size was not adequate after the first week of data collection, therefore the response period was extended one week (7 days). Reminder e-mails were sent to all enrolled online undergraduate students.

As participants followed the survey link, they first read general information regarding the study purpose, and they were provided with an informed consent form. Once participants agreed to the conditions of the survey and provided informed consent, they were directed to the survey items. Participants had access to complete the survey once and were not able to return to the survey once it was submitted. After successful submission of the survey, participants received an end of survey message reminding them that survey responses would remain confidential and secure on the university network. All participants who successfully completed the survey were offered the opportunity to opt into a random drawing for the chance to win one of five \$20 Visa gift cards. Incomplete survey responses were not included during data analyses.

Data Analyses

Quantitative data analyses were used to answer the research questions in this study. All analyses were conducted using IBM SPSS Version 25.

Preliminary analysis

Before statistical analyses began, the researcher cleaned the data to increase confidence in statistical results. Unclean data can hide effects that are present or show effects that are not true,

causing Type I or Type II errors. This preliminary review included an inspection of descriptive statistics, an evaluation of missing data, a check for outliers, and a check for normality. The researcher inspected descriptive statistics for accuracy of input, confirmed measurement scales were selected correctly for each variable, and ensured coding was entered correctly. The researcher reverse coded all PSS-10 positively stated items (4, 5, 7, 8) and created composite score variables for the SWLS and each subscale of the PSS-10 and MSPSS. Next, the researcher evaluated the amount and type of missing data. The researcher reviewed two elimination questions that were used in the survey: (1) a confirmation of informed consent and (2) a confirmation of enrollment in online classes during the spring 2021 semester. One case was removed for declining to give consent and three cases were removed for responding that they were not enrolled in online classes during the spring 2021 semester. Thirteen additional cases were removed for submitting an incomplete survey. Then a missing value analysis was conducted in SPSS to determine if data was missing at random. Less than 5% of the data was missing and Little's MCAR test revealed that the data was missing at random.

The researcher checked for univariate and multivariate outliers. Univariate and multivariate outliers are problematic because they can affect estimates (over- or under- estimate error). Univariate outliers are data points that consist of an extreme value on one variable and multivariate outliers are a combination of unusual scores across at least two variables (Tabachnick & Fidell, 2012). Univariate outliers can be identified by z-standardizing each variable and then looking for scores that are beyond an absolute value of 3.29 (Statistics Solutions, 2021). Based on this threshold, no univariate outliers were identified. Multivariate outliers were assessed by comparing Mahalanobis distances to a chi-square distribution with the same degrees of freedom. Two cases had values below .001 and obvious signs of the same score being entered across all items, so the

cases were removed. Finally, the researcher assessed normality, which is the assumption that scores are normally distributed. The researcher visually examined histogram plots, checked for skewness, and ran a Kolmogorov–Smirnov Test of normality, which is recommended for samples larger than 50 (Tabachnick & Fidell, 2012). Although the Kolmogorov-Smirnov Test was significant, revealing a failure to meet normality, skewness values did not exceed the absolute value of 1, indicating the data was not substantially skewed (Hair et al., 2017).

A series of MANOVA tests were conducted to address the first research question and a hierarchical linear regression analysis was used to address the second and third research questions. Since CFAs from previous studies support multiple subscales for two of the three measures used in this study, that structure was retained for the following analyses.

Multivariate analysis of variance (MANOVA)

The first research question concerns demographic differences in perceived stress and perceived social support among online undergraduate college students. According to past studies of college students, perceptions of stress and social support may differ across gender, age, and race (Acharya, Jin, & Collins, 2018; Eisenbarth, 2019; Solberg & Villarreal, 1997). To answer the first research question, one MANOVA was conducted with the two subscales for perceived stress and another MANOVA was conducted for the three subscales of perceived social support. This allowed the researcher to test for differences in stress and support across demographics (age, gender, race) while also testing for interaction terms.

Assumptions of MANOVAs include independence of measurement, linearity between outcome variables, multivariate normality, homogeneity of variance-covariance matrix, and a lack of univariate and multivariate outliers (Hinkle et al., 2003). The assumption of independence of measurement states that scores in one sample must not be related to scores in

the other sample. The assumption of linearity states that outcome variables are combined in a linear fashion. Similarly, multivariate normality assumes that the combination of dependent variables is normally distributed. The assumption of homogeneity of variance states that the variance of one group must be similar to the variance of the other group. The researcher tested all MANOVA assumptions prior to analysis and reported each step in chapter 4.

Regression analysis

A hierarchical linear regression was conducted to answer the second and third research questions. The second research question concerns the direct and indirect relationship between perceived stress, perceived social support, and subjective well-being of online undergraduate college students. The first step of the regression model included the two subscales of perceived stress, the second step of the regression model included the three subscales of perceived social support, and the third step of the regression model included all subscales of both measures along with all interaction variables. The third research question of this study concerns the relationship between each source of perceived social support (family, friends, and significant others) on the well-being of online college students. Past studies of college students suggest that each source of support may impact well-being differently (Buote et al., 2007; Friedlander et al., 2007; Hoffman et al., 2002; Mattanah et al., 2010). The final regression model reveals the impact of each source of social support on well-being.

Regression assumptions include linearity of relationship, lack of outliers, normality of residuals, homoscedasticity, and lack of multicollinearity. The linearity of relationship assumption states that the criterion and each predictor variable must be linearly related (Hinkle et al., 2003). At this point the researcher has already checked for univariate and multivariate outliers. The normality of residuals assumption states that regression errors must be normally

distributed (Hinkle et al., 2003). The assumption of homoscedasticity states that the dispersion of residuals around the regression line should be similar at each value of the predictor (Hinkle et al., 2003). Lastly, the assumption of multicollinearity states that predictor variables should not be highly correlated with each other. The researcher tested all regression assumptions prior to analysis and reported each step in chapter 4.

CHAPTER 4

Results

Introduction

This chapter presents the results of each statistical analysis used to answer the three research questions of the study and is divided into three sections: (a) descriptive statistics, (b) demographic differences in perceived stress and social support, and (c) associations in perceived stress, social support, and well-being.

Descriptive Statistics

Variable means, standard deviations, and Pearson correlations are presented in Table 1. Scores for all measures used in the study were examined for reliability using Cronbach's alpha, which is presented on the diagonal of Table 1. As expected, the subscales of perceived stress (helplessness and efficacy) had a large-negative linear correlation. Helplessness had a moderate-negative correlation with well-being, while efficacy had a moderate-positive correlation with well-being. Likewise, helplessness had weak to moderate-negative correlations with each of the perceived social support subscales (support from family, friends, and significant others) whereas efficacy had weak to moderate-positive correlations with each perceived social support subscale. Perceived social support from family and significant others had moderate-positive correlations with well-being, while perceived social support from friends had only a weak-positive correlation with well-being.

Demographic differences in perceived stress and social support

A series of multivariate analyses of variance (MANOVAs) were conducted to address the first research question concerning mean differences between demographic variables and perceived stress and social support. Demographic variables tested in these analyses included

gender (male, female), age (traditional, nontraditional), and race (white, African American).

Participants who skipped demographic items were removed listwise from the MANOVA analyses, resulting in a new sample size of 141. This sample was 83% female (n=118), 59.6% white (n=84), and 73% nontraditional-aged (n=103) students.

Table 1
Descriptive Statistics, Correlations, Reliability Statistics

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Stress- Helplessness (1-24)	13.15	5.08	.89	-.71**	-.25**	-.34**	-.19*	-.43**
2. Stress- Efficacy (0-16)	9.63	3.07	-.71**	.84	.28**	.33**	.23**	.53**
3. PSS- Friends (4-28)	20.28	6.48	-.25**	.28**	.95	.48**	.48**	.27**
4. PSS- Family (4-28)	20.99	6.45	-.34**	.33**	.48**	.95	.53**	.38**
5. PSS- Others (4-28)	22.84	6.01	-.19*	.23**	.48**	.53**	.95	.37**
6. Well-being (5-35)	21.83	7.29	-.43**	.53**	.27**	.38**	.37**	.89

Notes: *N* = 178; PSS = perceived social support; Cronbach's alpha reliability statistics are in bold on the diagonal; **p* < .05; ***p* < .01

MANOVA assumptions

All MANOVA assumptions were tested: linearity, multivariate normality, homogeneity of variance, an absence of univariate and multivariate outliers, and an absence of multicollinearity. The assumption of linearity states that all pairs of dependent variables must have a linear relationship with each other. The dependent variable in the first MANOVA analysis is stress. Linearity was assessed by reviewing a scatterplot of the two subscales of stress (helplessness and efficacy), which appear to be linearly related (Figure 1a). The dependent variable in the second MANOVA analysis is social support. Linearity was assessed again by reviewing a scatterplot of the three subscales of social support (friends, family, significant others), which appear to be linearly related (Figures 1b-d).

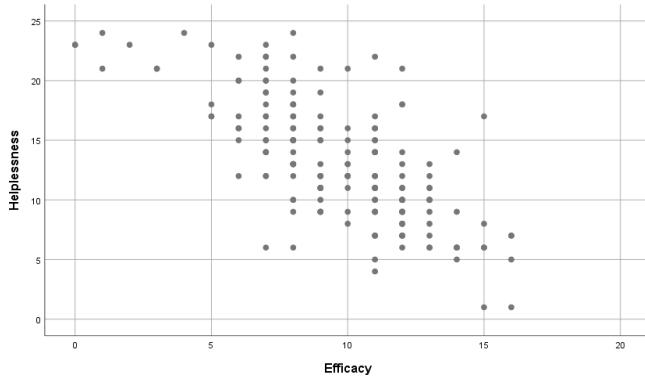


Figure 1a.
Scatterplot of Stress Variables

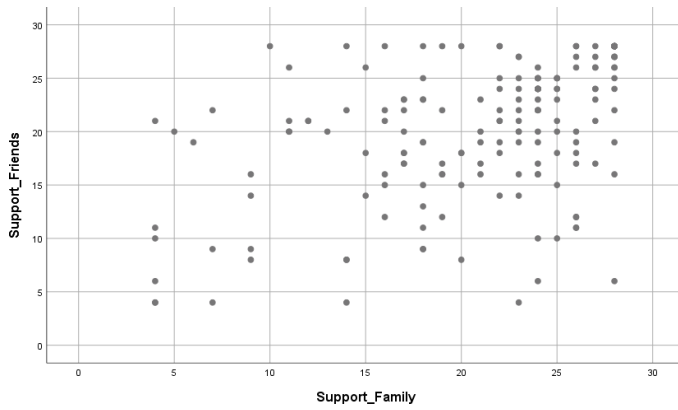


Figure 1b.
Scatterplot of Support Variables: Friends and Family

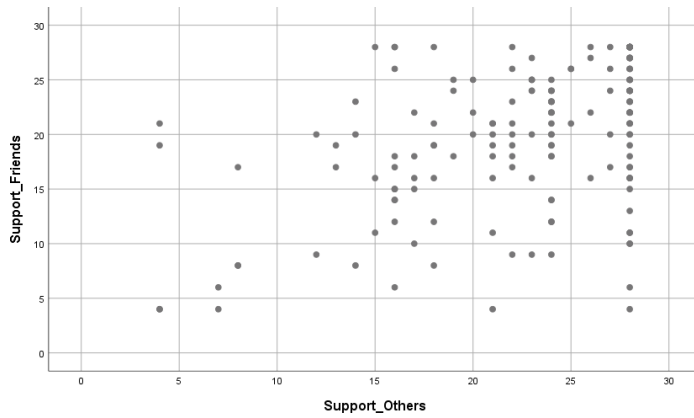


Figure 1c.
Scatterplot of Support Variables: Friends and Others

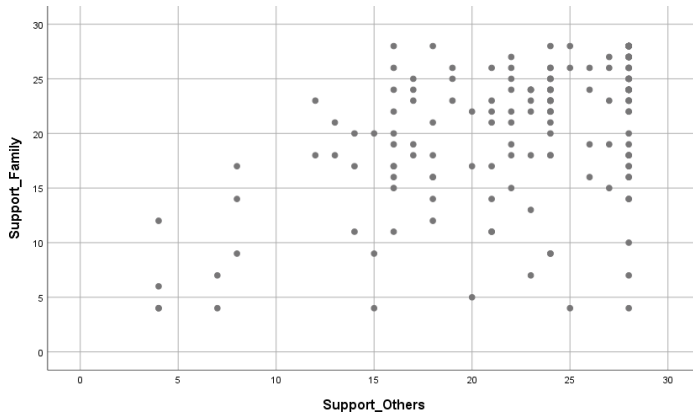


Figure 1d.
Scatterplot of Support Variables: Family and Others

Multivariate normality was tested by plotting Mahalanobis distances using a q-q plot, which appeared to be normally distributed indicating the assumption was met (Figure 2). Homogeneity of covariances was assessed using Box’s M test, which resulted in the absence of significant alphas indicating the assumption was met.

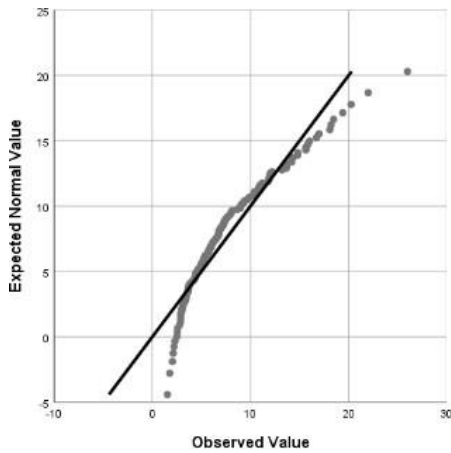


Figure 2
Normal Q-Q Plot of Mahalanobis Distance

The assumption of the absence of univariate and multivariate outliers was tested. According to Statistics Solutions (2021), univariate outliers may be present when standardized cases are outside the absolute value of 3.29 for samples of 50-300. After reviewing all standardized scores,

none were present outside of the 3.29 threshold, indicating an absence of univariate outliers. Multivariate outliers were assessed by comparing Mahalanobis distances to a chi-square distribution with the same degrees of freedom, which resulted in the absence of any values above the critical chi-square value of 16.27, indicating the absence of multivariate outliers. Lastly, the assumption of multicollinearity was assessed by reviewing correlations between dependent variables. None of the correlations exceeded a value of .80, indicating an absence of multicollinearity.

MANOVA results for perceptions of stress

The first MANOVA analyzed the two subscales of perceived stress (helplessness and efficacy) with gender, age, and race. When assessing differences in helplessness and efficacy score means simultaneously, MANOVA results revealed a statistically significant two-way interaction between gender and age, $F(2,132) = 3.40, p < .05$; Wilk's $\Lambda = .951$, partial $\eta^2 = .05$. These results (Figure 3) have a small effect size yet reveal that traditional-aged men perceive lower levels of stress than nontraditional-aged men, whereas traditional-aged women perceive greater levels of stress than nontraditional-aged women.

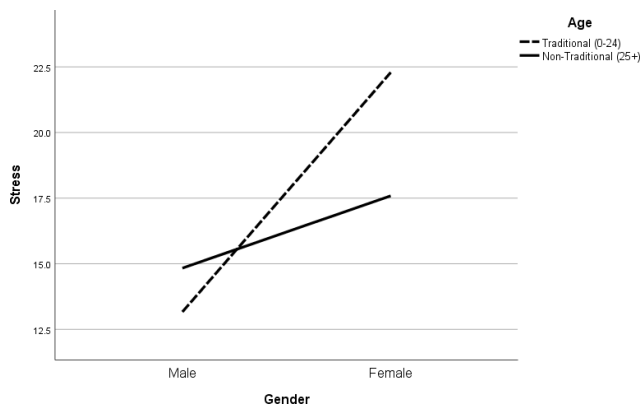


Figure 3
Two-way Interaction Plot of Gender and Age for Stress

For perceptions of helplessness, there was a statistically significant difference in scores based on the two-way interaction between gender and age in the follow-up ANOVA ($F(1) = 6.64, p < .05$). These results (Figure 4) reveal that nontraditional-aged men ($M = 10.39, SD = 3.43$) perceive greater levels of helplessness than traditional-aged men ($M = 9.00, SD = 6.21$), whereas traditional-aged women ($M = 16.67, SD = 4.44$) perceive greater levels of helplessness than nontraditional-aged women ($M = 12.26, SD = 4.85$).

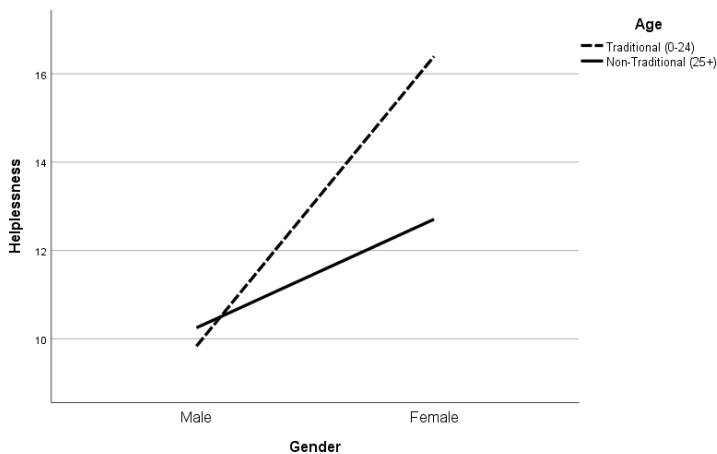


Figure 4
Two-way Interaction Plot of Gender and Age for Helplessness

For perceptions of efficacy, there was a significant difference in scores based on the two-way interaction between gender and age in the follow-up ANOVA ($F(1) = 4.49, p < .05$). These results (Figure 5) in reveal that traditional-aged men ($M = 12.40, SD = 2.88$) perceive greater levels of efficacy than nontraditional-aged men ($M = 10.50, SD = 2.64$), whereas nontraditional-aged women ($M = 9.94, SD = 2.91$) perceive greater levels of efficacy than traditional-aged women ($M = 8.58, SD = 2.67$).

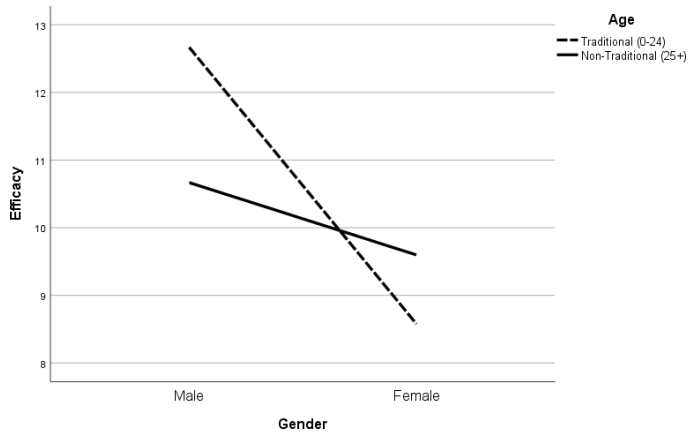


Figure 5
Two-way Interaction Plot of Gender and Age for Efficacy

When assessing differences in helplessness and efficacy score means simultaneously, MANOVA results revealed a statistically significant main effect for stress across gender $F(2,132) = 7.08, p = .001$; Wilk's $\Lambda = .903$, partial $\eta^2 = .09$. These results suggest that gender has a moderate effect on stress. For perceptions of helplessness, there was a statistically significant difference in scores based on gender in the follow-up ANOVA ($F(1) = 4.23, p < .001$) with women ($M = 13.49, SD = 5.12$) reporting significantly higher perceptions of helplessness than men ($M = 10.09, SD = 4.06$). For perceptions of efficacy, there was a statistically significant difference in scores based on gender in the follow-up ANOVA ($F(1) = 7.63, p < .05$) with men ($M = 10.91, SD = 2.75$) reporting significantly higher perceptions of efficacy than women ($M = 9.56, SD = 2.90$).

MANOVA results for perceptions of social support

The second MANOVA analyzed the three subscales of perceived social support (family, friends, significant others) with gender, age, and race. When assessing differences in social support means simultaneously, there was a statistically significant three-way interaction between gender, age, and race, $F(3,131) = 3.44, p < .05$; Wilk's $\Lambda = .927$, partial $\eta^2 = .07$. These results

(Figure 6) reveal a moderate effect size for the three-way interaction and suggest that nontraditional-aged men and women perceive greater levels of social support than traditional-aged men and women, but only for white students. Alternatively, among African American students, traditional-aged men perceive greater levels of social support than nontraditional-aged men and nontraditional-aged women perceive greater levels of social support than traditional-aged women.

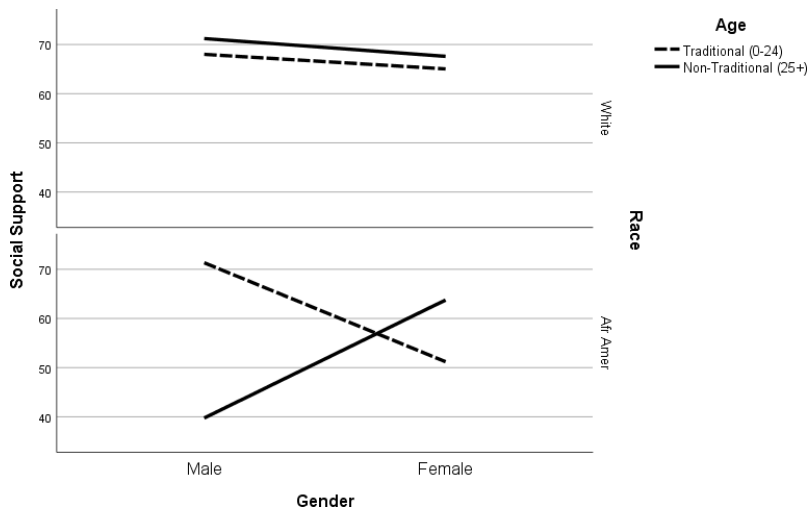


Figure 6
Three-way Interaction Plot of Gender, Age, and Race for Social Support

The three-way interaction between gender, age, and race was only significant for perceptions of social support from family in the follow-up ANOVA ($F(1) = 10.34, p < .01$) but was not significant for perceived social support from friends or significant others. The results (Figure 7) indicate that white students of nontraditional and traditional ages reported very similar levels of perceived social support from family. However, among African American students, nontraditional-aged men ($M = 10.00, SD = 6.98$) reported lower perceptions of social support from family than traditional-aged men ($M = 26.33, SD = 2.89$) and traditional-aged women ($M =$

16.70, $SD = 8.04$) reported lower perceptions of social support from family than nontraditional-aged women ($M = 21.38$, $SD = 6.27$).

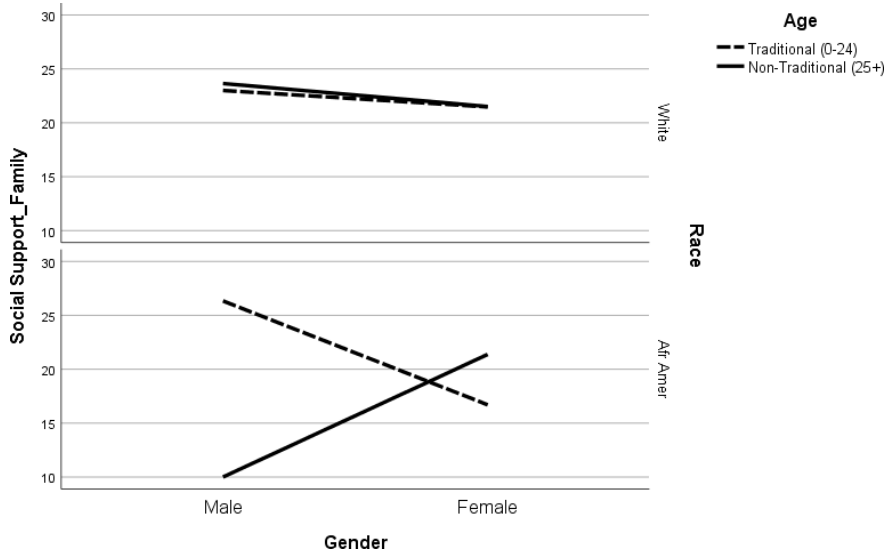


Figure 7
Three-way Interaction Plot of Gender, Age, and Race for Social Support from Family

When assessing differences in social support means simultaneously, there was a statistically significant two-way interaction between gender and age, $F(3,131) = 4.52$, $p < .01$; Wilk's $\Lambda = .906$, partial $\eta^2 = .09$. These results (Figure 8) reveal a moderate effect size and suggest that traditional-aged men perceive greater levels of social support than nontraditional-aged men, whereas nontraditional-aged women perceive greater levels of social support than traditional-aged women. The two-way interaction between gender and age was significant for perceptions of social support from family and friends in the follow-up ANOVA, but not for perceived support from significant others.

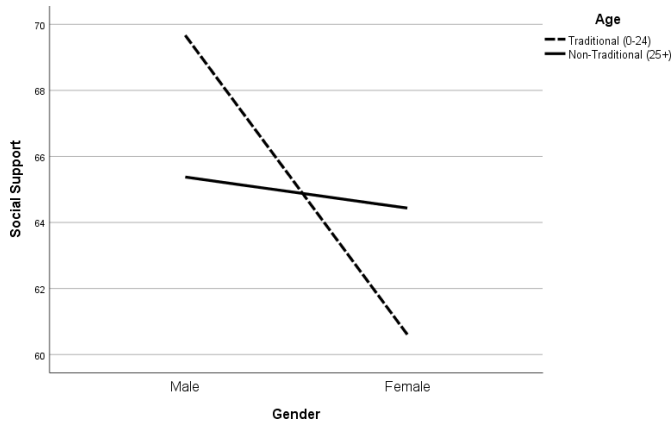


Figure 8
Two-way interaction plot of gender and age for social support

For perceptions of social support from family, there was a significant difference in scores based on the two-way interaction of gender and age in the follow-up ANOVA ($F(1) = 9.21, p < .01$). These results (Figure 9) suggest that traditional-aged men ($M = 25.00, SD = 2.83$) perceived greater levels of social support from family than nontraditional-aged men ($M = 20.61, SD = 7.51$). Alternatively, nontraditional-aged women ($M = 21.45, SD = 5.57$) perceived greater levels of social support from family than traditional-aged women ($M = 20.03, SD = 7.31$).

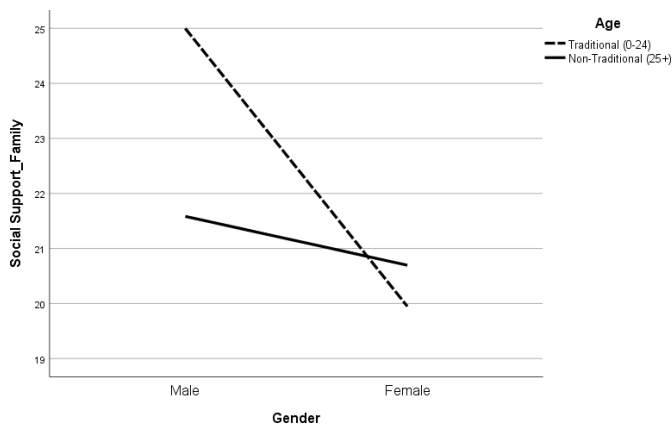


Figure 9
Two-way Interaction Plot of Gender and Age for Social Support from Family

For perceptions of social support from friends, there was a significant difference in scores based on the interaction of gender and age in the follow-up ANOVA ($F(1) = 6.44, p < .05$). The results (Figure 10) suggest that traditional-aged men ($M = 22.80, SD = 5.59$) perceive greater levels of social support from friends than nontraditional-aged men ($M = 18.72, SD = 6.79$), whereas nontraditional-aged women ($M = 21.21, SD = 6.10$) perceived greater levels of social support from friends than traditional-aged women ($M = 18.12, SD = 7.67$).

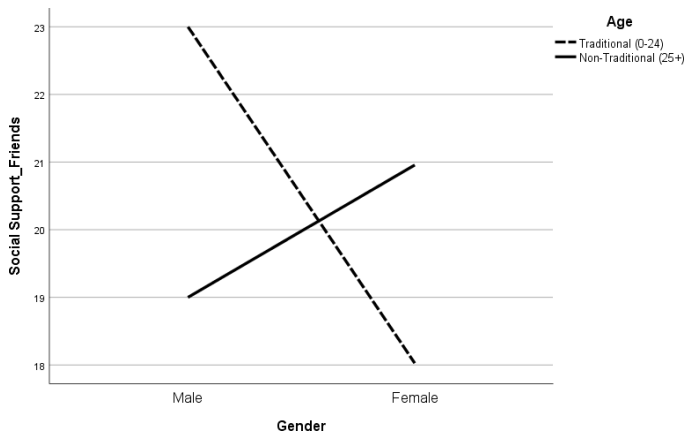


Figure 10

Two-way Interaction Plot of Gender and Age for Social Support from Friends

Lastly, results revealed a significant main effect for perceived social support across race $F(3,131) = 4.48, p < .01$; Wilk's $\Lambda = .907$, partial $\eta^2 = .09$. These results reveal that race had a moderate effect size on perceived social support. The differences in scores based on race were significant for perceptions of social support from family and significant others, but not for support from friends. For perceptions of social support from family, there was a significant difference in scores based on race in the follow-up ANOVA ($F(1) = 5.13, p < .05$) with white students ($M = 21.89, SD = 5.20$) reporting higher perceptions of social support from family than African American students ($M = 20.02, SD = 7.30$). For perceptions of social support from significant others, there was a significant difference in scores based on race in the follow-up

ANOVA ($F(1) = 12.75, p < .001$) with white students ($M = 24.98, SD = 3.99$) reporting higher perceptions of social support from significant others than African American students ($M = 20.63, SD = 7.00$).

Associations in perceived stress, social support, and well-being

A hierarchical linear regression analysis was conducted to answer the second and third research questions related to whether perceived stress and perceived social support are significantly associated with online college students' well-being. The sample size for the regression analysis was 178 and was 81.5% female ($n=145$), 50% white ($n=89$), and 65% nontraditional-aged ($n=115$) students.

Regression assumptions

All regression assumptions were tested: linearity of relationship, a lack of outliers, normality of residuals, homoscedasticity, and multicollinearity. Linearity of relationship states that each criterion and predictor should be linearly related. The assumption was assessed by reviewing scatterplots (Figures 11a-e) of each pair and all relationships appear to be linear.

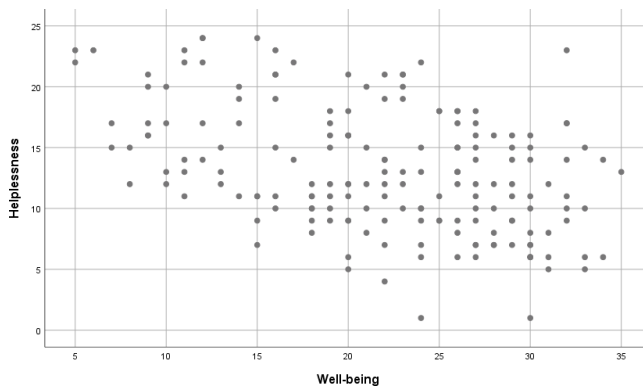


Figure 11a
Scatterplot of Helplessness and Well-being

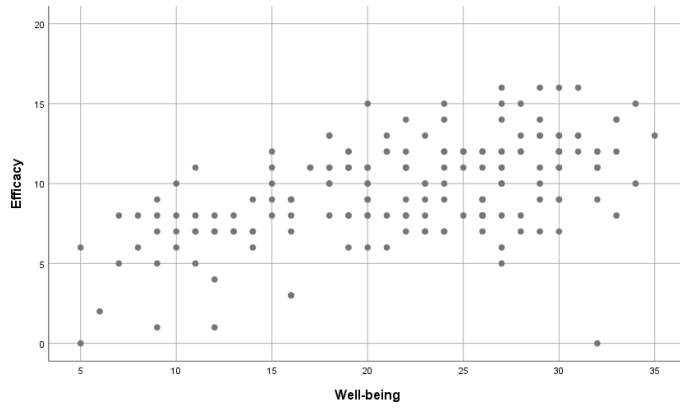


Figure 11b
Scatterplot of Efficacy and Well-being

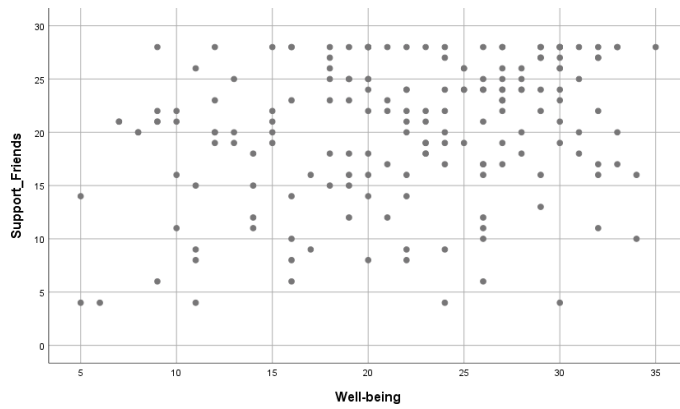


Figure 11c
Scatterplot of Support from Friends and Well-being

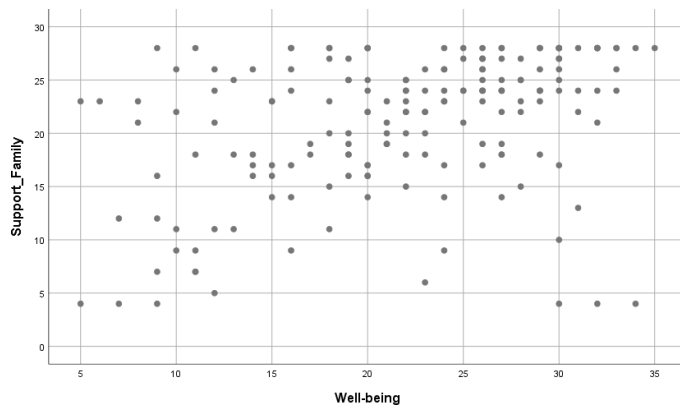


Figure 11d
Scatterplot of Support from Family and Well-being

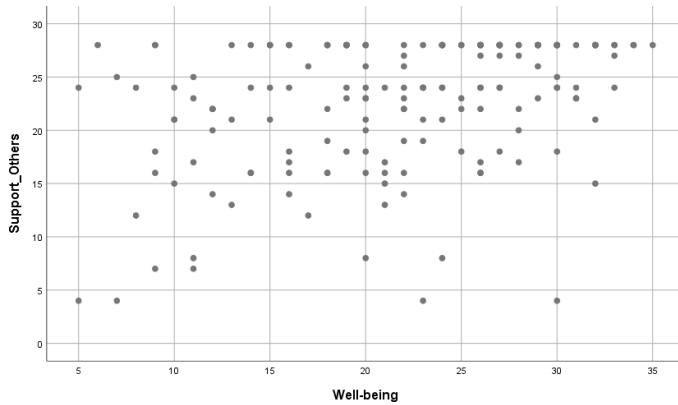


Figure 11e
Scatterplot of Support from Others and Well-being

The assumption of the absence of univariate and multivariate outliers was tested. After reviewing all standardized scores, none were present outside of the 3.29 threshold, indicating an absence of univariate outliers (Statistics Solutions, 2021). Multivariate outliers were assessed by comparing Mahalanobis distances to a chi-square distribution with the same degrees of freedom, which resulted in the absence of any values above the critical chi-square value of 16.27, indicating the absence of multivariate outliers. The normality of residuals assumption states that regression errors must be normally distributed. Histograms of regression residuals were reviewed and there appeared to be normal distribution indicating the assumption was met (Figures 12a-b).

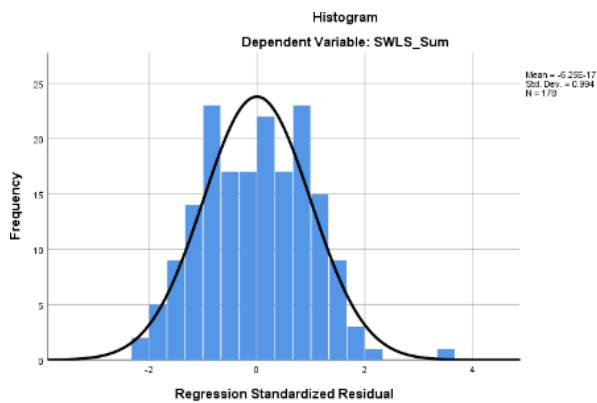


Figure 12a
Histogram of Regression Residuals of Stress

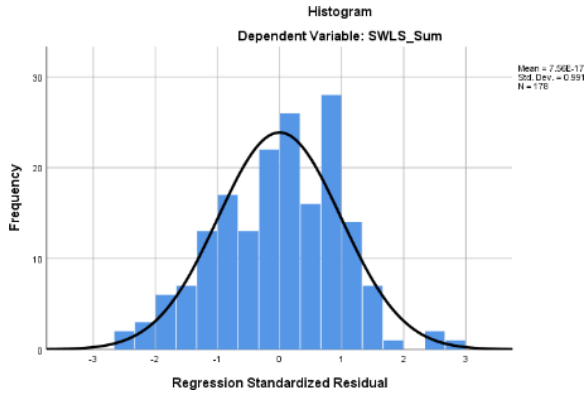


Figure 12b
Histogram of Regression Residuals of Social Support

The assumption of homoscedasticity states that the dispersion of residuals around the regression line should be similar at each value of the predictor. Scatterplots of standardized predicted values and standardized residuals were reviewed and did not appear to have a fan shape, indicating the assumption was met (Figures 13a-b).

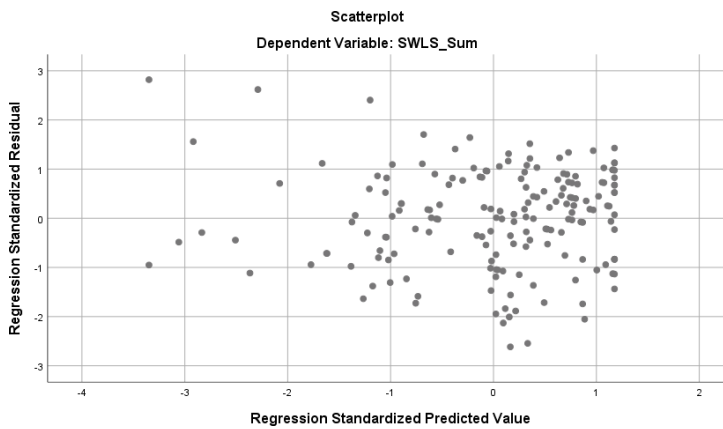


Figure 13a
Plot of Standardized Values of Social Support

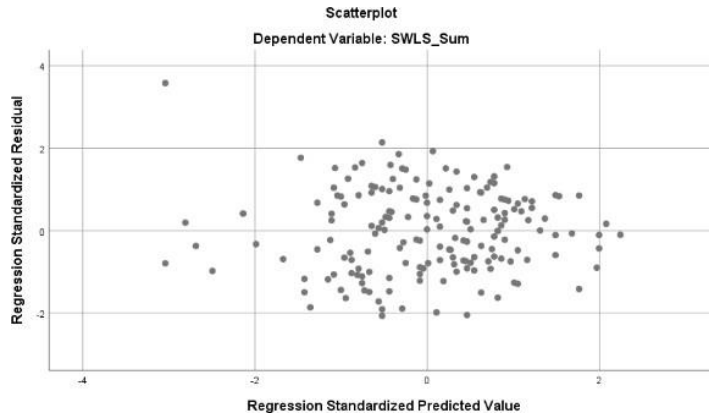


Figure 13b
Plot of Standardized Values of Stress

Lastly, the assumption of multicollinearity states that predictors should not be highly correlated with each other. This assumption was assessed by reviewing the tolerance and variance inflation factors (VIF) for each predictor. All tolerance levels were greater than .2 and all variance inflation factors were less than 5 indicating the assumption was met.

Regression results

First, the two subscales of perceived stress (helplessness and efficacy) were entered into the hierarchical regression model, followed by the three subscales of perceived social support (friends, family, and significant others), and lastly the stress-support interaction variables. All model statistics and regression coefficients are presented in Table 2. The initial regression analysis revealed a significant main effect of stress as a predictor for well-being, $F(2, 175) = 35.73, p < .001, R^2 = .29, \text{Adj. } R^2 = .28$. This suggests that perceived stress accounts for roughly 29% of the variance in online college students' well-being. Efficacy had a statistically significant positive association with well-being ($B = 1.074, p < .001$), while helplessness was not significantly correlated with well-being.

Social support was added as a predictor into the next regression model and the analysis revealed a significant main effect on well-being, $F(5, 172) = 19.66, p < .001, R^2 = .36, \text{Adj. } R^2 = .35$. Model change statistics reveal that R^2 increased .07 when the second block of predictors was

added, and the model change was statistically significant ($p < .001$). This suggests that perceived stress and perceived social support together account for 36% of the variance in online college students' well-being. Efficacy had a statistically significant positive association with well-being ($B = .939, p < .001$) and was the strongest predictor of well-being in the model. Social support from significant others ($B = .260, p < .001$) also had a statistically significant positive association with well-being. All other predictors in the model were not significantly associated with well-being.

In the final regression model stress-support interaction variables were entered as predictors and the analysis revealed a statistically significant main effect on well-being, $F(11, 166) = 8.88, p < .001, R^2 = .37, \text{Adj. } R^2 = .33$. However, model change statistics reveal that the interaction variables did not significantly improve the model prediction of well-being and none of the interaction variables had a statistically significant association with well-being. The results of this model indicate that social support functions as a main effect on well-being but did not serve as a buffer of stress on the well-being of online undergraduate college students.

Table 2
Hierarchical Linear Regression Coefficients

<i>Step</i>	<i>Predictors</i>	<i>Unstandardized coefficients</i>		<i>R</i> ²	<i>R</i> ² Change	<i>F</i>	<i>p</i>
		<i>B</i>	<i>SE</i>				
1				.290	.290	35.73	.000
	Stress- Helplessness	-.161	.130				
	Stress- Efficacy	1.074**	.215				
2				.364	.074	19.66	.000
	Stress- Helplessness	-.111	.126				
	Stress- Efficacy	.939**	.208				
	PSS- Friends	-.025	.082				
	PSS- Family	.135	.088				
	PSS- Others	.260**	.092				
3				.371	.007	8.88	.935
	Stress- Helplessness	-.124	.128				
	Stress- Efficacy	.945**	.213				
	PSS- Friends	-.055	.090				
	PSS- Family	.162	.162				
	PSS- Others	.276*	.096				
	Helplessness * Friends	.297	.803				
	Helplessness * Family	-.177	.801				
	Helplessness * Others	-.560	.782				
	Efficacy * Friends	-.030	.784				
	Efficacy * Family	.186	.760				
	Efficacy * Others	-.183	.768				

Notes: *N* = 178; PSS= perceived social support; **p* < .01; ** *p* < .001

CHAPTER 5

Discussion

This study had two main objectives: (1) to examine demographic differences in online college students' perceptions of stress and social support and (2) to test associations between stress and subjective well-being while also examining the role of social support in this relationship. The following sections will include a discussion of the study results, implications of major findings, limitations, and considerations for future research.

Demographic differences in perceived stress and social support

Following suggestions from past research, the first research question of this study aimed to identify demographic differences in perceived stress and social support among online undergraduate colleges students. This is important to consider since these perceptions impact how individuals appraise and cope with events that are perceived as stressful.

Gender and age

Past studies of traditional-aged, on-campus undergraduate college students suggest that women perceive higher levels of stress than men (Acharya et al., 2018; Karaman et al., 2017). Similarly, results of this study found that nontraditional-aged female college students enrolled in online degree programs also perceive higher levels of stress than their male counterparts. However, this study adds to the literature by using a measure of stress that is separated into two constructs: helplessness and efficacy. Results revealed that female online students perceive a higher sense of helplessness and lower sense of efficacy than male online students. Furthermore, traditional-aged women perceived a higher level of helplessness and lower level of self-efficacy than nontraditional-aged women. Alternatively, nontraditional-aged men perceive a higher level of helplessness and lower level of self-efficacy than traditional-aged men. The underlying

reasons as to why nontraditional-aged women and traditional-aged men perceive lower levels of stress is unclear but these findings could be due in part to their perceptions of social support.

Results from this study reveal that nontraditional-aged women perceived higher levels of social support from family and friends than traditional-aged women, and the opposite is true for men with traditional-aged men perceiving higher levels of social support from family and friends than nontraditional-aged men. As discussed by Lakey and Cohen (2000), there are intrapersonal and interpersonal mechanisms by which social support impacts well-being. The authors' social cognitive perspective proposes an intrapersonal mechanism by which social support impacts well-being, suggesting that social support functions by promoting a strong sense of self. This could explain why nontraditional-aged women and traditional-aged men who perceive higher levels of support also report higher levels of efficacy, as compared to traditional-aged women and nontraditional-aged men. Lakey and Cohen (2000) offer another explanation through their stress and coping perspective, which proposes an interpersonal mechanism by which social support impacts well-being, suggesting that social support functions by serving as a protection against the adverse effects of stress. The perception of sufficient social support may influence individuals' appraisals of threatening events as being less stressful, which minimizes the negative effect of the stressor on the individual's well-being. So, it could be that nontraditional-aged women and traditional-aged men who perceive higher levels of support use that support as a positive coping strategy and as a result perceive lower levels of helplessness, as compared to traditional-aged women and nontraditional-aged men.

Race

Past studies suggest that students from underrepresented groups (such as first-generation students, students from historically underrepresented racial/ethnic minority groups, and students

from disadvantaged socio-economic backgrounds) experience increased long-term stress that is directly related to chronic exposure to stressors associated with their marginalized status (Bowman, 2006; Smedley et al., 1993). This is especially true for minority students attending elite and predominantly white institutions (Cokley et al., 2011; Shahid et al., 2018). Past studies suggest that social support is particularly important among racial and ethnic minority populations, as these student groups may require greater levels of support to combat psychological distress as compared to their white peers (Albright and Hurd, 2018; Solberg and Villarreal, 1997). In this study there were no significant differences in perceived stress across race. However, results from this study suggest that African American online college students perceive lower levels of social support from family and significant others than white students. This separation was especially true for perceptions of social support from family. While white students across age and gender reported very similar levels of social support from family, there were significant differences in these perceptions among African American students. Nontraditional-aged African American men reported lower levels of perceived social support from family than traditional-aged African American men, while the opposite was true for women with traditional-aged African American women reporting lower levels of perceived social support from family than nontraditional-aged African American women.

Past studies suggest that social support from family enhances African American students' self-concept and self-esteem (Lamborn & Nguyen, 2004), and low family support is linked with increased vulnerability to stress which is associated with greater psychological distress, poor college adjustment, and low self-esteem (Gebre and Taylor, 2016). Results of this study indicate that nontraditional-aged African American men and traditional-aged African American women perceived lower levels of social support from their family, which puts them at a higher risk of

psychological distress. Although the literature suggests that there are differential outcomes in well-being across race, the results of this study underscore the importance of considering intersectionality in demographic variables when examining perceptions of social support.

Associations in perceived stress, social support, and well-being

The next two research questions in this study aimed to examine (1) how perceived stress (helplessness and efficacy) impacts the subjective well-being of online college students and (2) how perceived social support (from family, friends, and significant others) impacts the subjective well-being of online college students.

Stress and well-being

The study results revealed a direct, negative association between perceived stress and well-being, with stress accounting for roughly 29% of the variance in online college students' well-being. This is aligned with past studies of college students, which have linked stress with indicators of negative psychological well-being such as depression and anxiety (Acharya et al., 2018; Deatherage et al., 2014; Eisenbarth, 2019), poor adjustment (Brougham et al., 2009; Solberg & Villarreal, 1997), and low life satisfaction (Demakis & McAdams, 1994; Karaman et al., 2017). When the stress subscale constructs were reviewed, efficacy, but not helplessness, had a statistically significant association with subjective well-being. Echoing past studies (Dwyer & Cummings, Saleh et al., 2017), this suggests that students who report higher levels of efficacy perceive lower levels of stress, which positively impacts well-being. Furthermore, researchers suggest that students who are more efficacious also have better stress coping strategies (Lyraikos, 2012) and are more resilient (Narayanan & Onn, 2016), which result in greater well-being.

Social support and well-being

The final research question of this study is regarding the role of perceived social support in the relationship between perceived stress and subjective well-being. This study tested these relationships using Cohen and Wills' (1985) main effect model and the stress buffering model of social support.

Main effect model. Results of this study revealed that perceived social support (from family, friends, and significant others) had a significant main effect on subjective well-being. Although the results reveal a significant, direct relationship, social support only accounted for 7% of the variance in online college students' subjective well-being. It is possible that other types of support or sources of support are more beneficial for online college students. For instance, past studies have found that adult online students benefit more from technological support (Erickson & Noonan, 2010; Nor, 2011) and pedagogical support (Dumais et al., 2013). Additionally, institutional support has been shown to predict dropout rates among online college students (Park & Choi, 2009), which could indicate that online students benefit more from faculty and campus support. When the support subscales were reviewed, only social support from significant others was significantly associated with subjective well-being of online students. These results are aligned with past studies that suggest support from spouses is more beneficial for online students since they are often working adults balancing multiple responsibilities and demands outside of school (Willging & Johnson, 2009; Zembylas, 2008).

Buffering effect model. Scholars suggest that social support may also function by buffering the negative effects of stress on well-being (Lakey & Cohen, 2000). The buffering effect model tested the interaction effects of social support on the relationship between stress and subjective well-being. Results revealed that none of the stress-support interaction variables had a

statistically significant association with well-being, further suggesting that social support does not function as a buffer for the negative effects of stress on well-being among this sample of online undergraduate college students. Although there is evidence supporting the buffering effect model in past studies of college students (Coffman & Gilligan, 2002; Szkody & McKinney, 2019; Szkody et al., 2020), the samples consisted of predominantly traditional-aged students. This could further underscore the beneficial impact of alternative types and sources of support among online, nontraditional-aged student populations.

Implications

Results of this study provide both practical and theoretical implications. First, practical implications will be discussed as they relate to online program design and administration. Then theoretical implications will be discussed regarding the function of social support among online student populations.

Practical implications

The results of this study show that stress accounts for nearly a third of all the variance in online college students' subjective well-being, with efficacy being the most significant factor. Higher education professionals should incorporate stress management workshops into new student orientation for online programs as a means to educate online learners of adaptive coping strategies for managing stress. Instructional designers can also create ways to promote efficacy in online programs such as offering mastery experiences like low-risk knowledge tests, providing pathways for student collaboration, and enhancing student-instructor engagement. Although social support only explains a small percentage of the variance in online students' wellbeing, the results of this study reveal that support from significant others is most important for online students. Higher education and student affairs professionals should create ways to engage online

students' families so that they have access to campus resources and information that may help them as they support the online learner in their household. Lastly, higher education professionals should be mindful of the vulnerable student populations who are enrolled in online programs. Underrepresented student groups may lack social support at home and therefore may need additional guidance and institutional support. Peer mentors, faculty mentors, and academic coaches should be embedded into online programs to further support these student groups.

Theoretical implications

Results of this study provide insight into how social support functions among online undergraduate student populations. The findings suggest that Cohen and Will's (1985) buffering effect model of social support may not be an appropriate fit for online, non-traditional aged students. More research is needed to further test this model among nontraditional-aged students and other types of support and sources of support should be considered as they may be more beneficial for this student population. Secondly, results of this study provide support for the importance of using an intersectionality approach to examining perspectives of stress and social support among online students, especially at urban institutions. This approach provides a more nuanced understanding of different perspectives across a diverse student population.

Limitations and future research

There are several limitations to consider, which lend themselves to future studies.

Sampling

First, the study utilized cross sectional data from only one timepoint at one institution in the US. This reduces the generalizability of the study results, and therefore future studies should consider collecting data from multiple time points and across multiple institutions from different geographic regions in the US. Secondly, this study was relatively small and contained

predominantly female students. Although the sample was racially diverse, the only races included in the MANOVA analyses were white and African American students since other minority groups represented such a small percentage of the sample. While this study was powered for a broad sample of diverse online students, future studies should power for subgroups and target those specific populations during recruitment. That will allow researchers to conduct further tests across student groups.

Measures of support

An additional limitation of this study was that it only included one measure of social support. The MSPSS scale includes items measuring social support from family, friends, and significant others but it does not clearly define significant others for the participants. Therefore, there is no way for the researcher to know who participants were considering as significant others when they completed the survey. Future studies that use the MSPSS should either clearly define for the participants who is considered a significant other or the researcher should include an open-ended question asking the student to identify who they are considering a significant other when completing the survey items. Additionally, this study did not measure other types of support (i.e., technological and pedagogical) or sources of support (i.e., faculty, staff, and peers) that may be beneficial for the well-being of this student population. Future studies should consider including other measurements of support. Lastly, this study did not consider informal support networks such as extended family and church communities, which are common among African American students. The literature suggests that social support from a network of relatives beyond the nuclear family unit is particularly important for African American students' well-being (Jarrett et al., 2010; Lamborn & Nguyen, 2004). Future studies should include these important sources of social support.

Context

Lastly, it is important to acknowledge that all data for this study were collected during the COVID-19 pandemic. First, students' perceptions of stress could have been impacted by their experiences during the pandemic. Additionally, due to social distancing guidelines set by the CDC (Centers for Disease Control and Prevention, 2021), students' social experiences may have been altered and thus students' perceptions of social support could have been impacted by these changes. Since data was collected at only one time point, the impact of the pandemic on perceptions of stress and social support could not be tested. Secondly, group comparisons between online and on-ground students could not be tested as on-ground classes were not widely offered during the spring 2021 semester, therefore limiting the scope of this study. Future studies should consider collecting data across multiple time points to account for potential contextual factors.

Conclusion

Enrollment in online programs is growing faster now than ever before, as seen locally at the University of Memphis where enrollment in these programs has increased 42.8% between fall 2018 and fall 2020 (University of Memphis, 2020). Although the pandemic was a factor in this growth, the University of Memphis continues to see an increase in online enrollment even after widespread vaccinations. It appears that online education is here to stay. Considering this growth in the higher education market, it is becoming increasingly important for university administrators to be made aware of the unique experiences and needs of this nontraditional student population.

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Appendix A Online Survey Questions

Part 1: Informed Consent

I have read the consent form and I agree to participate in this study. (Yes, No)

Part 2: Demographic Questions

1. Age (enter number)
2. Gender (Female, Male, Non-binary)
3. Race/ethnicity: (African-American, Asian, Hispanic/Latinx, Native American, Pacific Islander, White, Multi-racial, Other)
4. Current employment status: (Full-time, Part-time, Unemployed, Furloughed, Leave of absence)
5. Select the highest level of completed education for both of your parents: (High school/GED, Technical/Vocational certification, Some college- no degree, Associate's degree, Bachelor's degree, Graduate degree)
6. Do you currently qualify to receive the federal Pell Grant? (Yes, No, Not sure)

Part 3: Enrollment Information

1. Are you currently enrolled, or plan to be enrolled, at the University of Memphis during the Spring 2021 semester? (Yes, No) *Qualifier Question*
2. What is your enrollment status for the Spring 2021 semester? (Part-time [less than 12 credit hours]; Full-time [12 or more credit hours])
3. What is your current student classification? (Freshman [1-29hrs], Sophomore [30-59hrs], Junior [60-89hrs], Senior [90+ hrs])
4. Is this your first semester attending the University of Memphis? (Yes, No)
5. Is this your first semester taking online courses? (Yes, No)
6. Do you plan to complete all courses for your degree online? (Yes, No)
7. Which format is used for most of your online courses this semester? (Only asynchronous- no required log-in days/times; Only synchronous- required log-in days/times; Mix of both)
8. Are you currently enrolled through a corporate partnership program (example: FedEx LiFE Program, Methodist LeBonheur MAAP Program, City of Memphis COMPETE Program, Memphis Fire RISE Program, Nike Lane 4 Program): Yes, No, Not sure
9. Please let us know your primary reasons for choosing to take your classes online during the 2021 semester (mark all that apply).
 - a. Enrolled in an online degree program
 - b. Reasons associated with the COVID-19 pandemic.
 - c. Flexibility in scheduling.
 - d. Tuition rate.
 - e. Preference to learn online versus in person
 - f. It was the only option available
 - g. The online program is highly ranked/ nationally recognized.
 - h. I am not geographically located near campus.
 - i. Other ____

Part 4: Perceived Stress Scale (PSS)

Instructions: In this section you will be asked about your feelings and thoughts during the last month. In each case, please use the scale to indicate how often you felt or thought a certain way (Never=0, Almost Never=1, Sometimes=2, Fairly Often=3, Very Often=4)

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Part 5: Multidimensional Scale of Perceived Social Support (MSPSS)

Instructions: In this section, read the following statements carefully and indicate how you feel about each one using the scale. (Very Strongly Disagree=1, Strongly Disagree=2, Mildly Disagree=3, Neutral=4, Mildly Agree=5, Strongly Agree=6, Very Strongly Agree=7)

1. There is a special person who is around when I am in need.
2. There is a special person with whom I can share joys and sorrows.
3. My family really tries to help me.
4. I get the emotional help & support I need from my family.
5. I have a special person who is a real source of comfort to me.
6. My friends really try to help me.
7. I can count on my friends when things go wrong.
8. I can talk about my problems with my family.
9. I have friends with whom I can share my joys and sorrows.
10. There is a special person in my life who cares about my feelings.
11. My family is willing to help me make decisions.
12. I can talk about my problems with my friends.

Part 6: Satisfaction with Life Scale (SWLS)

Instructions: In this section, read the following statements carefully and indicate how you feel about each one using the scale. (Strongly disagree=1, Disagree=2, Slightly disagree=3, Neither agree nor disagree=4, Slightly Agree=5, Agree=6, Strongly Agree=7)

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Appendix B
Consent Form

Consent for Research Participation

Title	Stress & Well-being of Online College Students: An Examination of the Role of Social Support
Researcher(s)	Angela Robinson, University of Memphis Dr. Yeh Hsueh, University of Memphis
Researchers Contact Information	Angela.Robinson@Memphis.edu

You are being asked to participate in a research study. The box below highlights key information for you to consider when deciding if you want to participate. More detailed information is provided below the box. Please ask the researcher(s) any questions about the study before you make your decision. If you volunteer, you will be one of about 100 people to do so.

Key Information for You to Consider
<p>Voluntary Consent: You are being asked to volunteer for a research study. It is up to you whether you choose to participate or not. There will be no penalty or loss of benefit to which you are otherwise entitled if you choose not to participate or discontinue participation.</p> <p>Purpose: The purpose of this research is to examine online undergraduate college students' perceptions of stress and social support. Through this study we hope to gain a deeper understanding of how these factors function to impact online college students' well-being.</p> <p>Duration: It is expected that your participation will last less than 10 minutes.</p> <p>Procedures and Activities: You will be asked to provide demographic and enrollment information and answer questions about your experiences as an online student.</p> <p>Risk: Some of the foreseeable risk or discomforts of your participation include psychological risks such as stress or emotional distress, inconvenience, and possible loss of confidentiality.</p> <p>Benefits: Although there is no direct benefit to you, through this research we hope to gain valuable information about this topic and population.</p> <p>Alternatives: Participation is voluntary, and the only alternative is to not participate.</p>

Who is conducting this research?

Angela Robinson, LI, of the University of Memphis, Department of Educational Psychology and Research is in charge of the study. Her faculty advisor is Dr. Yeh Hsueh. There may be other research team members assisting during the study. None of these members have a significant financial interest, and/or a conflict of interest related to the research.

What happens if I agree to participate in this Research?

If you agree you will be asked to complete an online survey that includes demographic information, enrollment information, and questions about your feelings regarding stress, well-being, and your perceptions of social support while in college. You may skip any question that makes you uncomfortable and you may stop the survey at any time.

What happens to the information collected for this research?

Information collected for this research study may be used for publication and/or presentation at professional conferences. Any identifying information collected in the survey will remain confidential.

How will my privacy and data confidentiality be protected?

We promise to protect your privacy and security of your personal information as best we can. Although you need to know about some limits to this promise. Measures we will take include:

- The use of a University sponsored and secured online survey platform
- Data will be stored on a password protected computer that is only accessible by the lead investigator of this study.
- The data will only be shared among the research team and will not be accessible by anyone outside of the team.
- All identifying information will be removed from the data once data collection is complete.

Individuals and organization that monitor this research may be permitted access to inspect the research records. This monitoring may include access to your private information. These individual and organization include the Institutional Review Board (IRB) at the University of Memphis.

What other choices do I have besides participating in this research?

If you do not want to be in the study, there are no other choices except not to take part in the study. As a student, if you decide not to take part in this study your choice will not affect your academic status or grade in your class.

What if I want to stop participating in this research?

It is up to you to decide whether you want to volunteer for this study. It is also ok to decide to end your participation at any time. There is no penalty or loss of benefits to which you are otherwise entitled if you decided to withdraw your participation. Your decision about participating will not affect your relationship with the researcher(s) or the University of Memphis.

Will it cost me money to take part in this research?

There are no costs associated with participation in this research study.

Will I receive any compensation or reward for participating in this research?

After completion of the survey you will have the option to opt into a random drawing for the chance to win one of five \$20 Visa gift cards. Each participant has a 5% probability of being selected from the drawing. Winners will be notified by University e-mail once data collection is complete and then coordination will be made to mail the winnings via USPS.

Who can answer my question about this research?

Before you decide to volunteer for this study, please ask any questions that might come to mind. Later, if you have questions, suggestions, concerns, or complaints about the study, you can contact the investigators: Angela Robinson at Angela.Robinson@Memphis.edu or Dr. Yeh Hsueh at YehHsueh@Memphis.edu. If you have any questions about your rights as a volunteer in this

research, contact the Institutional Review Board staff at the University of Memphis at 901-678-2705 or email irb@memphis.edu. We will give you a signed copy of this consent to take with you.

STATEMENT OF CONSENT

I have had the opportunity to consider the information in this document. I have asked any questions needed for me to decide about my participation. I understand that I can ask additional questions through the study.

By signing below, I volunteer to participate in this research. I understand that I am not waiving any legal rights. I have been given a copy of this consent document. I understand that if my ability to consent for myself changes, my legal representative or I may be asked to consent again prior to my continued participation

Name of Adult Participant **Signature of Adult Participant** **Date**

Researcher Signature (To be completed at the time of Informed Consent)

I have explained the research to the participant and answered all of his/her questions. I believe that he/she understand the information described in this consent and freely consent to participate.

Name of Research Team Member **Signature of Research Team Member** **Date**

Appendix C
IRB Approval

The data collected for this study was covered under University of Memphis IRB# PRO-FY2021-221.