DOCTORAL STUDENTS' STRESS AND COPING AMID THE CORONAVIRUS PANDEMIC

by

Kira Elton

A thesis submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Master of Arts in
Sociology

Charlotte

2022

Approved by:

_____
Teresa Scheid, Ph.D.
Chair

_____
Anne K-Kathrin Kronberg, Ph.D.

_____
Yang Cao, Ph.D.

ABSTRACT

KIRA ELTON. Doctoral Students' Stress and Coping Amid the Coronavirus Pandemic
(Under the direction of DR. TERESA SCHEID)

The coronavirus pandemic had a profound change to daily life. While the pandemic could be considered a stressful event within its own right, graduate school is also known to induce stress; this stress occurs due to time constraints, financial strain, evolving job market, their academic workload, and interpersonal difficulties with faculty, peers, and significant others. Graduate students have also been experiencing lower satisfaction with their graduate programs due to weak training for the current non-academia-focused job market. The purpose of this study is to understand the stressors, coping mechanism/social support, and well-being/stress of doctoral student during the pandemic.

ACKNOWLEDGEMENTS

First, I would like to acknowledge Dr. Teresa Scheid for everything she has done for me throughout my degree. She is patient, reassuring, enthusiastic, motivating, and extremely perceptive. Dr. Scheid also helped immensely when I began suffering with fibromyalgia and was a beacon of hope during those dark times. I am beyond grateful for having her as a mentor during my time at UNC Charlotte. I want to thank my committee members Dr. Anne-Kathrin Kronberg and Dr. Yang Cao for their assistance with my thesis and my graduate education. Dr. Scheid, Dr. Kronberg, and Dr. Cao impact on my degree will not be forgotten. I also want to thank Dr. Elizabeth Sterns for my first semester teaching assistantship of her Introduction to Sociology Lab, that helped me realize my aspiration of becoming a Sociology instructor.

I would also like to thank my family and close friends for their support no matter the situation. I am very lucky to have people who have chosen to be a fixture in my life when they had no obligations to stand by my side. I am eternally grateful for Donna Brodhecker for taking me into her family. She is truly the kindness woman I have ever met, and I cannot imagine where I would be without her. I am grateful for all those who have passed, including Craig and Lisa Elton and Joan Miller; I will continue to try to live up to your legacies.

TABLE OF CONTENTS

INTRODUCTION

During the coronavirus pandemic, there has been a profound change to daily life; with changes in illness, employment, and isolation. As a result, many have experienced psychological distress due to the precarious nature of the pandemic and lack of control. Previous research on quarantines shows a decline in mental health, including increased emotional distress, anxiety, and depression (Shanahan et al. 2020). Consequently, stress and its mental health consequences have become a widely recognized issue.

While the pandemic itself is a stressful situation, college is a stressful event in its own right. Entry into college signifies entry into adulthood and a sense of freedom and independence. This phase of life houses novel academic and personal challenges. Early adulthood is a time that involves new emotional turmoil, new self-sufficiency, learning coping mechanisms, emerging mental health issues, and dealing with adulthood (Balon 2020). This often means lessons learned the hard way; which could cause emotional distress and without the social support of family and long-term friends that previously existed. Additionally, one of the harsh realities that many face is uncertainty over future employment or opportunities. Balon (2020) found that one in four college students was diagnosed or treated for anxiety, one in three college students had trouble functioning with their depression, over 80 percent of college students felt overwhelmed, and 45 percent of college students felt hopeless.

While college can be considered a stressful event, graduate school can induce even more stress due to the conflicting roles of being a student, being an employee, and the roles outside of the academic setting, such as daughter, significant other, mother/father, and friend. Within the role of a full-time graduate student, one takes several classes, works on their individual research, and has other student obligations, such as going to talks of visiting and non-visiting faculty.

Students who are funded as either research or teaching assistants must meet the role demands of student and part-time employees working under the supervision of faculty. The role of a teaching assistants or research assistant becomes more complicated with non-definitive work hours per week and often unclear expectations. The roles of student and research and/or teaching assistant often are not distinctly different and lead to ambiguity of roles. Graduate students are put in the complicated position of having an employer that could be the same faculty that oversees their education. The complicated nature of this boils down to role strain. Oswalt and Riddock (2007) found that most graduate students were stressed at 48.9 percent and almost a quarter (24.7 percent) were very stressed; many also experience guilt over their decision to pursue their education.

With the movement to online learning, graduate students faced an exacerbation of the normal stressors of graduate education. They were isolated, had no clear separation of roles as student and assistant, no clear separation of home life and school life, potentially decreased access to faculty, ambiguity in expectations, and decreased potential connection with their cohort or fellow students. At the same time, for some students, COVID-19 provided opportunities for greater autonomy and mastery due to fewer daily hassles, such as daily traffic or commute, which allowed for more connection with those they lived with or increased time for self-care. This thesis will explore the experiences of graduate students during the covid-19 pandemic. I begin by overviewing dominant theories of stress and how it is relevant to graduate student stress during the pandemic; then, I explain how I will be researching doctoral students stress during the pandemic.

LITERATURE REVIEW

Stress and Mental Health

According to Wheaton and Montazer, stress is a widely used term (Wheaton and Montazer 2009). Part of this is the continuing evolution of stress research. Another reason for the wide use of this term is the widespread media use of the term. Stressors, distress, and stress are often used similarly but have different meanings. Stressors are the demands in our social environment, distress is the behavioral response to a stressor, and stress is the biological response in the body from a stressor. I will draw upon the stress process theory to understand the sources of stress for graduate students. In addition, role theory is also important as much of the stress experienced by graduate students is due to the multiple roles they must juggle. Discrepancy theory may also hold powerful insights for graduate students. As explained by Carr (2014), E. Tory Higgins developed this theory to explain how discrepancies affect mental health. Discrepancy theory represents the gap between whom we want to be, our ideal self, and who we actually are, actual self. There is also an "ought self," which others want us to be. The gap between the ideal self and ought self and the actual self can create strain. This strain, in turn, causes stress. This is important to understand graduate students because the "ought self" and "ideal self" may not be in alignment with the "actual self" in graduate school.

Stress Process Theory

The Stress Process Model is the primary theory that I will be using to explain stress variation in graduate students. Stress process theory has three major conceptual domains: “the sources of stress, the mediators of stress, and manifestations of stress” (Pearlin et al. 1981:337). The macro-level of “social stress can be traced to the very boundaries of societies, their

structures, and culture" (Pearlin et al. 1981:338). The micro-level of stress is caused by life events, daily hassles, chronic strains, and network events.

Life events change the homeostasis of life (Pearlin et al. 1981). The COVID-19 pandemic was a major life event. "From a psychological perspective, pandemics constitute life events associated with, each of which is known to trigger stress and emotional distress, including internalizing symptoms (anxiety and depression), and anger" (Shanahan et al. 2020:824). Stress during the pandemic has caused uncertainty, ambiguity, and loss of control (Shanahan et al. 2020). Additionally, the mediators that are typically used to deal with stress may have been disrupted, especially social supports. I suspect that there was an interruption or adjustment for coping mechanisms due to a lack of social connection and modification of behaviors due to "lifestyle disruptions, social isolation, and loneliness" (Shanahan et al. 2020:824).

Graduate school is also a life event. While students choose this life event, this does not negate the stressors that are endured. To understand graduate student stressors, we will look to undergraduate students to understand the broader impact of higher education. Mental health issues are rampant among undergraduate students (Wang et al. 2014). Directors of college counseling centers reported that there has been a ninety-two percent increase in severe psychological problems (Hefner and Eisenberg 2009:491). Demanding life events and failure commonly are often to blame for worsening mental health. Worsening depression and anxiety have direct implications for quality of life (Wang et al. 2014).

Network events are when someone within your social network experiences an adverse situation for which you provide emotional support. Within the pandemic, network events are closely tied to life events from the constantly shifting social structures of the pandemic. Daily hassles are issues dealt with regularly and are more irritating than stressful in the moment, like

daily traffic (Carr 2014). The pandemic lessened daily hassles in some ways; for example, by not having to deal with traffic or finding parking on campus (Shanahan et al. 2020).

Chronic strains have the most impact on mental health and distress (Carr 2014). Chronic strains are from conflicts, frustrations, and other role strains encountered by long-term conflicts or frustrations. Chronic strains in this paper are the stressors of one's personal life outside of graduate school; potential chronic stress could be gender, poverty/finances, and race.

Mediators of stress. Mediators of stress are the changing of "behaviors, perceptions, and cognition" that allow one to adjust for the stressors in his or her life (Pearlin et al. 1981:340). There are two common mediators: coping mechanisms and social support. Coping mechanisms change the stressful situation, the meaning of an issue, and stress management (Pearlin et al., 1981). Coping is either problem-focused or emotional-focused. People use emotionally focused coping strategies when they believe that nothing can change a stressful situation. Social support is the help of others that they receive, either emotionally or physically, to counteract the issues causing stress (Wang et al., 2014). There are "three types of resources: instrumental, informational, and emotional" (Cohen 2004:676). Instrumental support is material aid that changes the stress, such as monetary help (Cohen 2004). Informational support is help via advice or guidance that changes the perception of the issue (Cohen 2004). Finally, emotional support is the "expression of empathy, caring, reassurance, and trust and provides opportunities for emotional expression and venting" (Cohen 2004:677).

Social support can also prevent individuals from experiencing stress (Wang et al. 2014). Our social connections are used as a stress buffer for our overall health (Cohen 2004). Additionally, strong social support limits our exposure to stress in the first place (Wang et al. 2014). I would thus expect those with a solid social support system to experience less stress with

this information. If the mediator of social support is lessened, as we saw in the research on undergraduates, stressed-based outcomes would increase.

Outcomes of stress. The reason that stress is so significant is due to its outcomes. Stress is associated with nearly every negative health outcome (Carr 2014). The health outcomes range from headaches, stomach aches, diabetes, high blood pressure, stroke, heart attack, and an increased risk of infection. This can be even more problematic during the time of an infectious pandemic. While physical outcomes of stress are essential, the most common are mental health-related: depression, anxiety, and suicide (Carr 2014).

Depression has four major components: emotional, cognitive, motivational, and somatic symptoms. According to Carr, Emotional symptoms include a sad mood and diminished pleasure (Carr 2014). Mental symptoms included changes in cognitive processes and hopelessness. Motivational symptoms include struggling to get out of bed and difficulty getting motivated. Somatic symptoms include physical conditions such as: "fatigue, headaches, or sleeping too much". Depression is the "most widely studied mental health outcome of stress". Depression is the most common diagnosis for mental health.

Additionally, depression is costly to organizations due to workplace absenteeism (Carr 2014). Carr states that depression is common for those with any loss; this includes roles, home, community, significant other, family member, or feeling of adequacy. Depression is also a common outcome for those feeling overwhelmed, trapped, and fearful.

"Anxiety includes unsettling feelings and emotions, as well as physical responses and behaviors associated with nervousness. Feelings might include worry, tension, and dread, whereas physical symptoms might include muscle tension, heart palpations, heightened blood pressure, and sweating" (Carr 2014:27). Up to thirty percent of all people experience anxiety in

their lifetime and eighteen percent of people experienced anxiety within the last year. Anxiety and depression stem from the same stressors; these illnesses symptoms concurrence of symptoms called comorbidity. Psychologists admit that mild symptoms have positive functions, but severe constant severe symptoms are problematic to health.

By far, the most problematic direct outcome of stress is suicide (Carr 2014). Even before the pandemic, suicide has dramatically increased in recent years. Baby boomers and males experience higher rates of suicide. Researchers cannot say that stress causes suicide, but pressure has been linked to depression, substance abuse, and anxiety. However, the macro stressor of economic decline has been related to suicide. As discussed by Durkheim, anomic suicide is due to disruption in social constructs that regulate our lives (Durkheim, Spaulding, and Simpson 2002). This means that when an economic boom or economic downturn happens, there is an increase of anomic suicide (Durkheim et al. 2002). During the pandemic, there were changes to every aspect of our lives. From work to social and everything in between, how we live our lives has completely changed. It stands to reason that there could be an increase in suicide due to massive shifting social structures.

Role Theory

Role theory explains that we hold several social roles every day; each comes with expectations that help guide that role (Biddle 1986). Role strain is the difficulty managing expectations within one given role (Hecht 2001).

An essential social factor of role theory is role accumulation, structured by social factors by allowing access to quality roles for some and not others shaped by social ties and socio-economic status (Carr 2014). Thus, role accumulation can cause stress to those that do not have access to quality roles. In graduate school, the roles of student and employee are often limited

and may not be in their control. This may change as time goes on as connections are built; however, with more limited social connections, the doctoral student may not know about the quality roles that exist; thus, limiting themselves to any position available. On the other end of the spectrum, role accumulation can become stressful when one feels that they do not have time for all the expectations made on them (Carr 2014). Stressors in one role can be counterbalanced by success in another role. Within the roles of student and employee, there are widely varying expectations with widely varying benefits and outcomes.

Work-life balance is the balancing act of managing both work and home life (Levecque et al. 2017). Previous research has shown that at the organizational level, the university setting has high rates of work-life balance conflicts, which is a significant predictor of mental health symptoms (Levecque et al. 2017). Work-life balance was shown to be an even more significant indicator of mental health due to conflicting demands. The most important factor was if there was a child in the house or not. Within a doctoral population in Belgium, there was a 34 percent higher chance of a woman in the graduate population experiencing two or more symptoms than a man in the overall graduate population (Levecque et al. 2017).

Research on Student Stress and Implications for COVID-19

Multiple studies have shown that the stressors of the pandemic have increased student stress (Hoyt et al., 2021; Shanahan et al., 2020). Both Hoyt et al. and Shanahan et al. stated that the three primary sources of pandemic stressors were social, academic, and financial (Hoyt et al. 2021; Shanahan et al. 2020). Pandemic-based stressors and hopelessness were the primary factors related to increases in stress during the pandemic (Shanahan et al. 2020). The pandemic created a state of constant stress for students; one student stated that “constant stress has become the new normal” (Hoyt et al. 2021:272). This statement seems to be backed by the fact that over

one-third of participants reported experiencing emotional distress (Hoyt et al. 2021). Going to college comes with a fair share of change, and with that comes a new social environment (Hefner and Eisenberg 2009). Students often report being homesick, having a sense of isolation, and have an increased interpersonal conflict (Hefner and Eisenberg 2009). All the aforementioned causes a weakened sense of social support. "Thirty-one percent of those reporting low-quality social support screened positive for probable depression" (Hefner and Eisenberg 2009:494). Additionally, a decrease in family contact was correlated with an increase in suicidal ideation (Hefner and Eisenberg 2009). Students who reported having financial struggles, not living with a significant other, being an international student, and being a racial minority reported lower quality of social support and higher rates of social isolation.

This means that not only are the stressors changing, but the change in social role occurs as well. The lessening of social ties due to changes in social relationships lessens the social support that is available to offset social stress. This would most likely be similar in graduate students because undergraduate social changes are similar to the social changes that occur in graduate school. Graduate school is a stressful experience. According to Rocha-Singh, Graduate students experience time constraints, financial strain, changing current job outlooks, their academic workload, and interpersonal difficulties with faculty, peers, and significant others (Rocha-Singh 1994). Additionally, while dealing with the aforementioned issues, doctoral programs are not adequately training students for a wide range of jobs due to the academic focus (Fuhrmann et al. 2011). Even within the physical sciences, doctoral students do not end up in academic fields. For example, forty-three percent of those who graduate with a Ph.D. in Biology go onto a non-academic setting. This stems from career preferences that have changed over time,

but graduate programs have not caught up to reality (Fuhrmann et al. 2011). This uncertainty is known to cause stress (Fuhrmann et al. 2011).

Additionally, the academic realms may also influence the graduate school experience and change the chronic strains that are experienced. By realms of academia, I specifically mean the type of program based on the program's definitive nature, such as physical sciences (also called natural sciences), social sciences, humanities, and business. Within the physical sciences, a doctoral dissertation "may entail working as part of a large team within a specific, well-defined project, and operating with pre-defined, transparent quantitative publication criteria" (Levecque et al. 2017:8). However, doctoral students in the humanities and social sciences are often left with the undertaking of researching their research idea; both humanities and social science also have the task of defining what is quality because there is less of a formal guide in this field (Levecque et al. 2017). Social sciences and humanities typically work alone, which can become isolating, and students may struggle with perseverance differently than with team support (Levecque et al. 2017).

The three most common internalized symptoms in Shanahan et al.'s pandemic research were depression, anxiety, and anger (Shanahan et al. 2020). The first way that most of those that avoided the adverse outcomes were coping with the pandemic was via social support of slowing down and enjoying the company of loved ones. Additionally, others appreciated the lack of daily hassles, like not dealing with certain hassles, such as commuting. Shanahan et al. showed that "stress levels and anger were higher during the pandemic than the pre-pandemic assessment"(Shanahan et al. 2020:826). Furthermore, it showed that one in seven participants experienced economic disruption. Problematically, economic disruption is associated with high levels of suicide.

Interestingly, the study also showed that "females were at higher risk of each of the three emotional distress indicators" (Shanahan et al., 2020:827). This was explained by female pre-pandemic social stressors being higher than males, and thus females during-pandemic distress were also higher. This suggests that chronic strain intensified when a life event occurred. Additionally, those that were distressed by the pandemic likely use coping strategies frequently, to begin with, due to prior cumulative life stress (Shanahan et al. 2020). Those that reported the 30.5 percent feeling notably worse "reported being frustrated with society's response to the pandemic and uncertainty about the future (of the pandemic, society, and their personal educational or professional future)" (Shanahan et al., 2020:828).

Surprisingly, 50.8 percent felt the same before and during stress-wise, and 18.7 percent felt notably better (Shanahan et al. 2020). Most that said this cited that they got to "appreciate the opportunity to decelerate their life" (Shanahan et al. 2020:831). Additionally, those that had a routine, exercised, practiced reframing, and had additional coping strategies were linked with lower distress (Shanahan et al. 2020). And those who used emotional coping via positive reappraisal, changing thought patterns about an event that cannot be changed, had less emotional distress (Shanahan et al. 2020). Thus, the coping mechanisms used during the pandemic were essential for the outcomes.

Research Objectives

This research will examine the doctoral students' experience of stress and coping amid the COVID-19 pandemic. COVID-19 produced profound changes to daily life, with risk of illness, unemployment, and social isolation. Previous research on quarantines shows a decline in mental health, with increased emotional distress, anxiety, and depression (Shanahan et al. 2020). Graduate students faced an exacerbation of the normal stressors of graduate education. They

were isolated, had no clear separation of roles as student and assistant, no clear separation of home life and school life, potentially decreased access to faculty, ambiguity in expectations, and decreased potential connection with their cohort or fellow students. The mediators that are typically used to deal with stress, especially social supports, were potentially interrupted. I will look for trends to support the following expectations:

1. Doctoral students will have elevated stress levels and poor mental health due to the Covid-19 pandemic during graduate school.
2. Disruptions in social relationships, school, and/or work will lead to elevated stress levels and poor mental health.
3. Women will have higher stress levels and worse overall well-being than men.

First, I anticipate doctoral students will have elevated stress because of the pandemic and graduate school. Two theories justify this statement: stress process theory and role theory.

Stress process theory. The pandemic and graduate school are both life events. As stated before, life events change the homeostasis of life and are known to increase stress (Pearlin et al. 1981). Having two life events happening at the same time should thus increase stress (Shanahan et al. 2020).

Role theory. Role accumulation causes stress when one feels they do not have enough time to do all that is expected of them (Carr 2014). The reason this is so important is that graduate students have multiple roles within the role of "graduate student"; they often have the roles of both "student" and either "teaching assistant" or "research assistant." Graduate students often have roles in their personal life as well; work-life balance is known to be challenging in the University setting. Work-life balance conflicts are a significant indicator of mental health symptoms.

Second, I anticipate that disruptions in social relationships, school, and/or work will equal elevated stress levels and poor mental health. The two theories supporting this idea are the Stress Process theory and the Discrepancy theory.

Stress process theory. Social support is one of the three mediators in stress process theory (Shanahan et al. 2020). Social support is receiving help from others that offset the stressor. Social support can also prevent individuals from experiencing stress altogether. When there is a decrease in social support, there could be an increase in stress-based outcomes.

Discrepancy theory. Discrepancy theory holds a powerful idea of why graduate school during the pandemic could cause immense stress. Discrepancy theory is the idea that there is a distinguishable difference between the "ideal self" and the "actual self" (Carr 2014). The idea of what one's graduate school experience would be like and the reality of it changing drastically with the pandemic allowed for a considerable discrepancy. This discrepancy causes stress for the student.

Third, I believe that women will have a higher stress level than men during the pandemic. Stress Process Theory is the key theory to explain this anticipated idea.

Stress Process Theory. Chronic strain is a stressor that does not subside over time and becomes a long-term stressor (Shanahan et al. 2020). Gender would be the chronic strain in this instance. With the life events of graduate school and the pandemic, as I described in the first research objective, chronic strains amplify life events' results.

METHODS

My methods included a qualitative pilot study and a quantitative survey of doctoral students. In spring 2021, I conducted two single-hour-long interviews investigating the differences between the pre-pandemic doctoral experience and the COVID-19 doctoral experience. The themes identified in the interviews were used to shape the survey. I sent an email to department chairs and various professors with an attached flyer about my research[2], emailed the participant confirming interest and asking for them to sign the Consent form via DocuSign, obtain a consent form via DocuSign, sent an email thanking the participants for signing the consent form on DocuSign, follow a script of questions, and once done with the interview I sent a list of mental health resources to the participant.

I connected participants via Zoom for the interviews. I conducted the interview by asking questions about their doctoral experience before and during the pandemic. Once done, I edited the transcription I deleted the recording. I coded the transcript using NVivo coding software and a thematic analysis procedure.

Coding and Analysis

To code my data, I used NVivo coding software; NVivo allowed me to code using a thematic analysis process. Coding is a process by which a researcher reviews the data and assigns meanings to the data. Coding involves six steps. First, the researcher must get familiar with the data; this typically involves reading through transcripts or other types of data several times before being able to fully understand the themes present (Nowell et al. 2017). Second, the researcher must generate initial codes (Nowell et al. 2017). Third, the researcher must search for themes within the codes and data (Nowell et al. 2017). Fourth, the researcher must refine the themes and decide if certain themes have enough data to warrant attention and discussion

(Nowell et al. 2017). Fifth, the researcher must define the discourse of each theme. Sixth, the research composes a valid discussion about the themes (Nowell et al. 2017).

I began coding the data by reading through my transcripts several times. After going through the transcripts around three times each, I had written down general codes that came up while I read along onto a word document. Next, I went through the transcripts a few more times and put codes on the data. Once I had felt firm in how the data was coded, I combined redundant codes. Following this, I grouped codes that were similar into themes and added subcodes when necessary. Then, I went through the codes again to make sure there were no further redundances and made sure that the grouped codes seemed appropriate. Finally, I made sure that my codes had sufficient data to be considered substantial. I ended up cutting out a theme because there was not sufficient data talking about that theme. Additionally, I moved the topic of "graduate school changes due to covid" from its own theme into the theme of "changes due to covid" because it seemed to be more of a code than a self-supporting theme in these interviews.

The interviews gave me insight into COVID-based stressors and graduate schools' workload. COVID-19 based stressors boiled down to the fear of the unknown, acclimation-based stressors, graduate school changes due to covid, and social changes. While most COVID-based stressors were rather straightforward, social changes and optimism/timing had two very interesting insights. Social changes had an unforeseen insight. Not having to commute had considerably different outcomes for both participants. Participant one was excited to not have to commute because she felt her commute took up most of her time. While participant two had seen losing the commute as losing her self-care time. Participant two had children had redirected her time to her children when the stay-at-home order was in effect. The only significant code that came about in graduate school was the code-heavy workload. Additionally, regarding social

changes, both interviews showed that living with someone during the stay-at-home order stated that their relationship with their significant others had brought them closer together. Furthermore, the code optimism/timing had 29 references. It showed me that COVID-19 worked in both participants' favor due potentially due to the timing of their programs, and the outcome of the situation.

To summarize, doing these interviews gave me insight into social changes that occurred and the multiple outcomes this could have. Furthermore, it showed me that living with a significant other during this time led to these participants having a deepened relationship with their significant others. The most important insight it gave me was that some benefited from a coping mechanism of optimism during the pandemic.

While these interviews gave me a plethora of information, the sample size was extremely small and may have led to biases. Not only was the sample size small but I also used snowball sampling, due to pandemic-based constraints. There was also a gender bias because both the participants were female.

These interviews allowed me to understand that participants that are similar on paper could have considerably different experiences; this insight helped inform a survey that let me explore the fuller overall doctoral experience and the differences that shaped the individuals' experiences during the COVID-19 pandemic.

Quantitative Survey

The purpose of this survey was to understand how doctoral students' experiences varied during the pandemic. I elected to focus on doctoral students who had begun their degree program in 2019 and who were still enrolled in the fall of 2022. These students would have experienced the full range of graduate education, pre, during, and post pandemic. They would also be looking

ahead to future jobs and career opportunities as they complete their dissertations. I also limited the sample to candidates living in the United States.

I applied through the IRB in April 2022. The IRB application number is IRB-22-1045. I submitted my IRB application six times total with one amendment; it was approved in September and had a final approval after an amendment in October. Following approval, I distributed the Qualtrics survey on October 24th, 2022 and closed it on November 19th, 2022. I used several distribution strategies. First, I used the "Research Study Announcement" link in the department of "Research and Economic Development." This form is used to distribute surveys to a specific group; this survey was distributed to all graduate students and filtered by participant opt-in. Next, I contacted the Center of Graduate Life and Learning to ask if they could distribute the survey to doctoral students again, but I did not get a response. After contacting the Center of Graduate Life and Learning, I sent the Doctoral Director Email[8] to each Doctoral Program's Director of Graduate Studies individually to ask them to forward my survey to their doctoral students; the majority of them responded and forwarded the email.

Once a participant received the graduate student email, it informed them with a shortened version of who is qualified to be a part of this study, the study purpose, the study procedures, and the link to the Qualtrics Survey. The opening of the Qualtrics Survey included a more detailed description of who is qualified to be a part of this study, the study purpose, the study procedures, and the link to the Qualtrics Survey. The survey was anonymous via Qualtrics. The participant had to consent via the Consent to be a Part of a Research Study[9] as the first question of the survey due to the possible risks below. The survey should have taken about thirty minutes.

This survey did include topics that could be difficult for some and required self-reflection. This survey also contained mental health self-assessments, which could have triggered

emotional distress for some individuals. Atoning for this, I wrote in the participant email what the survey contains and the expectations of the survey, and I had a list of resources at the end of the survey; the list of resources had information for University of North Carolina at Charlotte mental health resources, Mental Health Crisis Hotline information, and food insecurity resources.

The Qualtrics Survey was created by using the insights of my qualitative interviews and allows for a quantitative assessment of the stress-related experiences of doctoral students amid COVID. The survey had eight sections: Consent, Well-Being, COVID-19 Disruption, Graduate School, Professional Development, Employment, The Future, Identity, and Post-Survey Resources. The survey also included specific open-ended questions that allow for a fuller investigation of the experience of doctoral students.

Measurements. The overall answers are multiple choice, text entry, and matrix table. The multiple choice questions include I consent/ I do not consent, yes/no or yes/no/unsure, true/false, and categorical answers (i.e.. Program type). Text entry responses were used for mostly open-ended questions to gain a deeper understanding of the topic; for example, "How did COVID change your relationship with those you live with?" The matrix table responses were used for questions that used a Likert scale or linear number scale. Likert scale questions rate options 1 to 5 with choices similar to "none at all (1), a little (2), a moderate amount (3), a lot(4), a great deal(5)." The matrix set up allows for either one question or a subset of questions to be answered. My reason for using Likert scales is the commonplace of social science research using Likert Scale responses. Likert scales allow for a standardized response and a convenient way to understand the responses without an overwhelming number of choices. I had one question with a linear number scale response, and I used this response because it allowed for an appropriate rating of stress level.

My key concepts are stress, well-being, social support/social relationships, the graduate school experience, and the pandemic. For stress and well being I asked the following questions: **“**How would you rate your overall, mental, and physical well-being answered with a Likert scale 1 to 5, poor, fair, good, great, excellent, “How often do you feel stressed?” answered with never, seldom, sometimes, frequently, and always, “Rate your stress in 2020, 2021, 2022” answered nominally with 1 to 10, and “What part of your life causes you the most stress?” answered with an open ended text.

For the pandemic, I asked “Rate your stress in 2020, 2021, 2022” with answers from 1 to 10, “My coping strategies have changed because of the pandemic” with true or false, “How much has your life been disrupted by the Coronavirus (Covid) outbreak?” with answers of 1 to 5 from none at all, a little, a moderate amount, a lot, to a great deal, “Did you have to move due to the pandemic” answering yes or no, “Did your professional development change during the pandemic?” answering with yes, no, unsure, “Did you have to delay plans for graduation?” answering with yes or no, “My coping strategies have changed because of the pandemic” answering with true or false, and “How did your relationship change with those you live with?” answering with 1 to 5 from negatively to positively.

For social support/social relationships, I asked “How did your relationship change with those you live with?” answering with 1 to 5 negatively to positively and “How did your social relationships change?” answering 1 to 5 negatively to positively.

For graduate school, I asked “(choose your) program type” with answers of “social science, natural science, humanities, liberal arts, business, professional program, and engineering”, “If you had an assistantship.. How often did you feel overwhelmed? How frequently did your assistantship pertain to your career path? How frequently did you go over

your hours? How frequently did your assistantship interfere with your classes? How frequently did your assistantship? Interfere with your personal life? Did your assistantship interfere with your work-life balance?" with Likert responses of 1 to 5 never, seldom, sometimes, frequently, and always, "Did your professional development change during the pandemic?" answering with yes, no, or unsure, and "Did you have to delay plans for graduation?" answering with yes or no.

ANALYSIS

Analytic Strategy

To capture the data and the potential understandings I used a descriptive analysis and a bivariate analysis. I did a descriptive analysis for the first two research objectives due to lack of comparable data from before the pandemic. A bivariate analysis was used for the third research objective on gender differences; this allowed for a comprehension of the difference of trends between genders. Due to a non-random smaller sample, no further analysis could be done without making outlandish assumptions about the population. In my analysis, there are two types of variables; dependent variable, mainly stress and well-being, and explanatory variables, for example gender, the pandemic, and program type.

Sample Characteristics

Table 1-Sample Characteristics has the sample characteristics. The survey was distributed in November 2022, and after three weeks, out of 86 students, there were 57 participants that fit the criteria of completing the entire survey. The racial demographics were 63.79 percent White, 17.24 percent Asian, 8.62 percent Black or African American, and 10.34 percent other. The gender breakdown was 38.60 percent Male and 61.40 percent Female. Half of the participants were 30 or younger at 50.88 percent. Overall, the participants were an average of 32.48 years old; females average 29.12 years old, and males averaged 34.62 years old.

There were 38.60 percent males and 61.40 percent females. Male demographic breakdown was 47.83 percent were White, 8.70 percent African American, 26.09 percent Asian, and 17.39 Other. Female demographic breakdown was 74.29 percent White, 8.57 African American, 11.43 percent Asian, and 5.71 Other.

The participant's types of programs were 35.51 percent Social Sciences, 19.05 percent Natural Sciences, 3.17 percent Humanities, 7.94 percent Liberal Arts, 6.35 percent Business, 6.35 percent Professional Program, and 20.63 percent Engineering.

Findings

Table 2- Well-being and Stress has a descriptive analysis of the research objective: "Doctoral students will have elevated stress levels and poor mental health due to the Covid-19 pandemic and graduate school." The overall levels of stress were high. Twenty percent of participants always feel stressed, 40 percent of participants said they frequently feel stressed, 30 percent said they sometimes feel stressed, 10 percent said they seldom feel stressed, and no one responded that they never feel stressed.

Table 5- "What part of your life causes you the most stress?" was answered as follows: school at 45.16 percent, work at 24.19 percent, work/life balance 22.58 percent, and 8.06 percent finances, immigration at 3.22 percent, politics at 3.22 percent, isolation 1.61 percent, and the future at 1.61 percent. Participants that answered, participants mentioned the following: deadlines, the program/degree, research, academic responsibilities/stressors, graduation timeline, and time management. Some participants answered with more than one answer.

In Table 2- Well-Being and Stress, Participants rated their stress in 2020, 2021, 2022. The question stated "rate your stress from 1 to 10, 1 being lowest level of stress and 10 being highest level of stress. In 2020, the participants mean was 6.84 with a standard deviation of 2.35. In 2021, the participants mean was 6.87 with a standard deviation of 1.91. In 2022, the participants mean was 7.06 with a standard deviation of 1.69. Stress in 2020 was rated the lowest with an average of 6.84, followed by 2021 with an average of 6.87, and 2022 being the highest level with an average of 7.06. Variance decreased over the years at 2.35 in 2020, 1.91 in 2021,

and 1.69 in 2022. For well-being, I asked about overall, mental, and physical well-being; the ratings were out of 5 from poor, fair, good, great, to excellent. I asked, “How would you rate your _____ well-being?”; the insert would be for overall, mental, and physical well-being. Overall well-being had a mean for all participants of 3.34. The overall well-being for men was 3.50 and for women was 3.24. Mental well-being’s mean was 3.07. Physical well-being’s mean was 3.23. “How often do you feel stressed?” and the responses were from one to five, from never, seldom, sometimes, frequently, to always. The responses were as follows: zero percent never, 1.45 percent seldom, 37.86 percent sometimes, 50.72 percent frequently, 10.14 percent always.

Table 3-Pandemic examines the research objective: “Disruptions in social relationships, school, and/or work will equal elevated stress levels and poor mental health.” The question “How much has your life been disrupted by the Coronavirus (COVID) outbreak?” with answers of 1 to 5 from none at all, a little, a moderate amount, a lot, to a great deal. The mean was 3.45 with a standard deviation of 1.04; men’s mean is 3.41 with a standard deviation of 1.03 and women’s mean is 3.40 with a standard deviation of 0.93. The last quantitative question under the pandemic section is “Did you have to delay plans for graduation?” answered by yes or no. Most answered no with 64.29 percent and yes was answered by 35.71 percent. The question “Did your professional development change during the pandemic?” was answered by yes, no, or unsure. Most answered yes at 62.30 percent, no at 19.67 percent, and unsure is 18.03 percent.

In the survey, I asked, “In what way did your graduate experience change during the pandemic?” In response, the following was mentioned: no social connection at 10, more difficulty at 6, more opportunities at 5, less motivation, at 3, and research problems at 3.

There were two questions about living situations during the pandemic. First, “Did you have to move due to the pandemic” with yes or no answers. Most answered no with 81.82 percent and 18.18 percent answered yes. Men answered no at 81.82 percent and 18.18 percent answered yes. Women answered 88.57 percent no and 11.43 percent yes. Second, “How did your relationship change with those you live with?” with answered from 1 to 5 of negative, somewhat negative, neutral, somewhat positive, and positive. The mean for this question was 4.42 with a standard deviation of 1.06; men’s mean was 4.45 with a standard deviation of 1.20 and a women’s mean of 4.51 with a standard deviation of 0.94.

In the survey I asked, “How did COVID change your relationship with those you live with?” The majority responded that there was a positive change. The majority responded that there was a positive change with those they lived with at 20, no change at 15, and a negative change at 10. One positive response said “We were able to spend more time allowing us to explore the relationship.” Another stated “My wife and I became much closer!” and another said “Closer than before, now I would rather just spend time with her and nobody else.”

The positive responses essentially stated that they had become closer and have strengthened their relationships with those they lived with, specifically those that lived with their significant others. The neutral responses either said there was no change or there was both good and bad changes at the same time. The majority of those that stated that there was a negative response to the pandemic with those they lived with seemed to have lost part of their relationship with others or had not seemed to have been close to begin with. One participant stated that the “experience of living in close quarters with people not inside the immediate family was difficult.” A couple of participants described the decline of those they lived with by saying they are “Not as friendly as before” and another said, “we became less patient with each other”. An

interesting insight for the negative side was that COVID had “put a lot of pressure on” being with those that they lived with. There seems to not be a very clear pattern from the data present, but this could make an interesting topic for further exploration.

When asked “My coping strategies have changed because of the pandemic” with the answer choices of true and false, participants stated that their coping strategies have mostly changed by answering “True” 75.71 percent; with only 24.49 responding “false”. Men answered “true” less than women as men state “true” 63.64 percent true and women stated “true” 80 percent.

Participants were asked “How did your social relationship change?” and answered 3.79 with a standard deviation of 1.02 from an answer range of 1 to 5 from negative, somewhat negative, neutral, somewhat positive to positive. The data also showed that participants got closer to their social relationships outside of their programs and that their social connections in their programs seemed to become more distant. However, while social relationships were rated moderately high, participants stated that in their programs, there was a lack of social connections, one participant stated that “It became exactly what I DIDN'T want...online, distant, lack of connection to my cohort...” This statement essentially mirrored what other participants stated, the transition to an online experience made them feel isolated frustrated with their situation, and without support. This coincides perfectly with discrepancy theory and shows that the hopes for the person that they would be within this program and the disruption that COVID-19 caused for this created more stress. This data shows an interesting result of potentially higher stressors with better social supports to offset the outcome of stress.

Table 4- Bivariate Analysis looks at the research objective, “Women will have higher stress levels and worse overall well-being than men.” I had participants rate their stress in 2020,

2021, 2022. The question stated “rate your stress from 1 to 10, 1 being lowest level of stress and 10 being highest level of stress. In 2020, men’s mean was 6.50 with a standard deviation of 2.69; women’s mean was 7.09 with a standard deviation of 2.09. In 2021, men’s mean was 6.45 with a standard deviation of 2.46; women’s mean was 6.94 with a standard deviation of 1.49. In 2022, men’s mean was 7.09 with a standard deviation of 1.98; women’s mean was 7.14 with a standard deviation of 1.33.

The rate your stress response was out of 10. For 2020, the gender divide was 7.09 for women and 6.50 for men. For 2021, the women’s mean was 6.94 and men’s mean was 6.45. For 2022, women responded 7.14 and men responded 7.09. There was a similar response for physical, mental, and overall well-being. Women showed less mental well-being, slightly worse overall well-being, and worse mental well-being. The well-being scores were out of 5. For mental well-being, women responded 2.97 and men responded 3.27. For overall, women replied 3.24 and men replied 3.50. For physical well-being, women responded 3.23 and men responded 3.27.

For well-being, I asked about overall, mental, and physical well-being; the ratings were out of 5 from poor, fair, good, great, to excellent. I asked, “How would you rate your _____ well-being?”; the insert would be for overall, mental, and physical well-being. The overall well-being for men was 3.50 and for women was 3.24. Mental well-being’s males’ mean was 3.27 and females mean was 2.97. Physical well-being’s males mean was 3.27 and females mean was 3.23.

“How often do you feel stressed?” and the responses were from one to five, from never, seldom, sometimes, frequently, to always. The responses for men were as follows: zero percent never, 4.55 percent seldom, 31.82 percent sometimes, 54.55 percent frequently, and 9.09 percent

always. The response for women were as follows: zero percent never, zero percent seldom, 37.14 percent sometimes, 51.43 percent frequently, 11.43 percent always.

Interestingly, women were also linked to different types of programs. The professional doctoral program participants are all women. Social sciences are more likely to be women at 81.82 percent and men accounted for only 18.18 percent. Liberal arts are also mainly women at 80 percent and men accounted for 20 percent. Interestingly, most business participants were women at 75 percent. The natural sciences are pretty evenly split; women accounted for 58.53 percent, and men accounted for 41.67 percent. Engineering is mostly men at 90 percent and only 10 percent women.

Men answered the question of "How satisfied are you with your overall program?", that they were significantly more likely to respond as neutrally satisfied at 50 percent versus 22.86 percent, and women were significantly more likely to respond as somewhat satisfied at 31.43 percent versus 4.55 percent.

Important to note here is that both program and gender also had a correlating trend. Women were more likely to be in a social science program at 51.43 percent of women's total program type than at 18.18 percent men's total program type. Men were more likely to be in an engineering program at 40.91 percent men's program type total than at 2.86 percent women's total program type total. Further research is needed here to understand why there is a correlation between gender, program, and satisfaction.

Additionally, program satisfaction was also correlated with both program type. Humanities students were more likely to answer that they were extremely satisfied with their programs than social sciences, natural sciences, professional programs, or engineering. Social sciences and liberal arts students were more satisfied than engineering students.

For program satisfaction, I also looked at the questions of “How often did you feel overwhelmed?”, “How frequently did your assistantship pertain to your career path?”, “How frequently did you go over your hours?”, “How frequently did your assistantship interfere with your classes?”, “How frequently did your assistantship interfere with your personal life?”, and “Did your assistantship interfere with your work-life balance?” Unfortunately, these results did not lead to an insight on the differences; it did not even show non statistically significant trends.

DISCUSSION

Summary

As shown above, doctoral stress levels were moderately high and stress levels got worse over time. While COVID-19 did cause high amounts of disruption, social supports outside of the university did seem to counterbalance the disruption. Social supports outside of the university seemed to be more necessary as well because the social supports within the university did seem to decrease. Most importantly, while I cannot say there is a correlation due to small sample size and non-random sampling, gender did seem to coincide with program type and program satisfaction.

I looked at if doctoral students would have elevated stress due to the pandemic during graduate school. The survey showed that doctoral students did indeed have moderately high levels of stress. The data confirmed that doctoral students dealt with a myriad of stressful situations due to dealing with two life events: the COVID-19 pandemic and graduate school. Shanahan et. al (2020) spoke of how life events increase stress by changing the homeostasis of one's everyday life. Stress within graduate school can be explained by role strain and role conflict, which are known to cause tension. Additionally, the University setting is known to be a difficult environment to maintain a good work-life balance (Levecque et al. 2017). The trend of high levels of stress also does not surprise because both Hoyt et. al (2021) and Shanahan et. al (2020) both found that there was an increase in student stress during the pandemic.

Looking at the trends of disruptions in social relationships, school, and/or work leading to elevated stress levels and decreased mental health, I did seem to find that there were both moderately high levels of disruptions due to the pandemic and moderately high stress levels. While there were disruptions within graduate school during the pandemic, doctoral students did

find alternative methods of coping; more specifically, participants sought social comfort from people outside of their programs. Thus, when social connections declined within the university setting, social connections outside of the university increased. While there were still high levels of stress, there most likely would be even worse outcomes of stress unless the participant found solace in outside social relationships. Social support is one of the three mediators of stress (Shanahan et al. 2020). Social supports can even all together allow people to prevent the stress, and thus is a very important coping mechanism.

The data also showed that participants got closer to their social relationships outside of their programs and that their social connections in their programs seemed to become distant. A participant described the social connection of the program as follows: “It became exactly what I DIDN'T want...online, distant, lack of connection to my cohort...” This statement essentially mirrored what other participants stated, the transition to an online experience made them feel isolated and frustrated with their situation and found themselves without social support from the University. These feelings coincide with discrepancy theory; the participants had hopes for the person that they would be within this program and the disruption of COVID-19 caused a shift in their reality causing them to have a discrepancy in their ideal and actual self, causing stress. The data shows an interesting result of higher stressors but better social supports offsetting the outcome of stress.

Looking at the difference of gender across the survey, there were several themes that appeared to be present. There was a big difference in the stress levels of women and men, with women more stressed in 2020 but eventually men catching up to women’s stress levels by 2022. Essentially, as time went on, the levels of stress between the genders did seem to even out, but not how we thought stress would decrease in women after a life event**.** Both men and women had

higher standard deviation rates in 2020, but as time went on standard deviations decreased. A wider standard deviation shows greater variation in how the pandemic impacted individuals, but as time went on men could not sustain the initial momentum of dealing with this level of stress. While standard deviation did decrease by year in both genders, men had higher levels of standard deviation than women did in every year, meaning that the men's experiences of stress had a wider array of differences in experiences than women did. The literature said that women would have a gender gap that would compound over time but as time went levels of stress increased for men and essentially caught up to where women's stress levels were. Shanahan et al. (2020) stated that chronic strains essentially amplified life events The reason why women had a higher score at the beginning is easily explained by chronic strain. The chronic strain of gender amplified the new life event of COVID. However, over time it seems that the life events of graduate school and COVID-19 neutralized the chronic strain of gender, which was not expected.

While gender gaps do exist and are intensified by life events, we may not have a true understanding of how and why the closure in the gender gap over long term life events happens. While women may have more stress in the beginning of the life event, it may not be that women's stress decreases, but men's stress actually increases overtime to close the gender gap. As the pandemic has been classified as officially over, we are dealing with long term consequences from that life event, including a financial recession. The financial recession may be part of the closing of the gender gap with men being more prone to stress over financial circumstances.

One of the most significant insights in this survey was about gender, programs, and program satisfaction. Women were statistically less satisfied with their programs. Interestingly,

women were also linked to different types of programs. Women were more linked to the following programs in significance: Professional, Social Sciences, Liberal Arts, and Business. The natural sciences were split almost exactly evenly. Men were highly linked to Engineering. Which begs the question of why gender was linked with program type? I have several trains of thought here. First being, is the programs that women are tracked into less satisfying. If so, why? One reason could be outcome of monetary potential with each degree. Second reason could be the variability of the degrees that are typically associated with women. Male dominated fields could have clear cut tracks that are less dependent on variable parts that could have been affected by the pandemic. Potential variability could include more interpersonal connection for the Internal Review Board, surveys, experiments, and in person faculty/peer connection. Another reason for dissatisfaction could be due to isolating behavior for such women dominated degrees; this idea was specifically talked about in Levecque et al. (2017) about social sciences and humanities programs requiring extensive amounts of solitary research. There is also the possibility that genders have different experiences in or about school and thus have different satisfaction of graduate school. Further research is needed here as to what the correlations cause.

Limitations

While my research provides important insight into doctoral students' experiences amid COVID, there is limitations. While my survey had a respectable sample size, ideally, I would have had at least 100 participants for a smaller margin of error. My sample came from those who participated out of choice and that alone allows for a selection bias. A truly ideal situation would have allowed for a full population survey.

Next, the time of the semester for this survey may come at a biased time as well; typically, from the midterm to the end of the semester, students seem to be inherently more

stressed. This time can encompasses making up for a previous unwanted grade, big project, and professors trying to catch up to the proposed schedule. Additionally, before the holidays there is usually stress abound.

While this survey does address the COVID-19 pandemic, we are out of the peak of the pandemic. We are also dealing with an economic crisis that was not only due to the pandemic but the rising tensions with Russia and the European Union and it's allies. Ideally, we would have had a survey pre-pandemic, pandemic, and post-pandemic without the outside factors to have a full understanding of the full effect of the pandemic.

I have mixed feelings on the length of the survey. On the one hand, the survey could only ask so many questions due to a time constraint to entice doctoral students to participate. However, almost a third of the participants were halfway done with the survey and rendered their data completely pointless. Thus, if I had made the survey less extensive, I would have had almost a third more of the amount of data.

Furthermore, the statement in the survey "Rate Your Stress in 2020, 2021, and 2022" uses a linear number scale response, 1 to 10, instead of a Likert scale, 1 to 5, response. In hindsight, it would have made more sense to have a standardized response for all matrix questions to allow for comparison with other well-being Likert responses and simplicity of having all my numerical responses being the same type.

Future Directions

The research has plenty of ways to move forward in the future. Running the same survey with more time to acquire participants would help compare the trends in this research and see if they hold across time. Being able to compare data sets would allow for a more thorough

understanding. Further research needs to be done on racial differences or effects. Due to the small response, there was not enough data for a racial comparison.

I also found a correlation between gender and program type, gender and satisfaction, and satisfaction and program type. More research is needed to find out what the significance is between gender, program type, and satisfaction of doctoral programs. More research is needed on gender in relation to graduate students' degree satisfaction, well-being, and stress. While there was not statistically significant data about gender, well-being, and stress, there was trends that showed that gender had a slight correlation with well-being and stress; however, the sample was not random it cannot serve as a representative sample of the programs or gender. Doing this survey with a larger random sample would allow for a representative sample of the programs, gender, and allow for understanding other demographic factors correlations.

While I did see trends in the data, there is future analysis that could be done with this data. With the bivariate chart, you can clearly see certain trends. Going further with the data, someone would need to put the data into SPSS or R and do further analysis, such as ANOVA tests to show the full understanding of these variables relations to each other; such as program satisfaction and program type, program type and gender, and program type and well-being/stress.

Despite these limitations, this research provided important insight into the experiences of doctoral students during the pandemic, such as: program satisifcaiton may be linked to gender, gender may be linked to program types, students seem to have resilience with finding social supports to counter stress, there are positive outcomes of the pandemic, and that gender may have a different link to live events than previously thought.

REFERENCES

Balon, Richard. 2020. “College Stress Survival Guide.” *Academic Psychiatry* 44(6):789–91. doi: 10.1007/s40596-020-01350-6.

Biddle, B. J. 1986. “Recent Development in Role Theory.” *Annual Review of Sociology* 12:67–92.

Carr, Deborah S. 2014. *Worried Sick: How Stress Hurts Us and How to Bounce Back*.

Cohen, Sheldon. 2004. “Social Relationships and Health.” *The American Psychologist* 59(8):676–84. doi: 10.1037/0003-066X.59.8.676.

Durkheim, Emile, John A. Spaulding, and George Simpson. 2002. *Suicide: A Study in Sociology*. Florence, UNITED STATES: Taylor & Francis Group.

Fuhrmann, C. N., D. G. Halme, P. S. O’Sullivan, and B. Lindstaedt. 2011. “Improving Graduate Education to Support a Branching Career Pipeline: Recommendations Based on a Survey of Doctoral Students in the Basic Biomedical Sciences.” *CBE Life Sciences Education* 10(3):239–49. doi: 10.1187/cbe.11-02-0013.

Hefner, Jennifer, and Daniel Eisenberg. 2009. “Social Support and Mental Health among College Students.” *American Journal of Orthopsychiatry* 79(4):491–99. doi: 10.1037/a0016918.

Hoyt, Lindsay Till, Alison K. Cohen, Brandon Dull, Elena Maker Castro, and Neshat Yazdani. 2021. “‘Constant Stress Has Become the New Normal’: Stress and Anxiety Inequalities Among U.S. College Students in the Time of COVID-19.” *Journal of Adolescent Health* 68(2):270–76. doi: 10.1016/j.jadohealth.2020.10.030.

Levecque, Katia, Frederik Anseel, Alain De Beuckelaer, Johan Van der Heyden, and Lydia Gisle. 2017. “Work Organization and Mental Health Problems in PhD Students.” *Research Policy* 46(4):868–79. doi: 10.1016/j.respol.2017.02.008.

Nowell, Lorelli S., Jill M. Norris, Deborah E. White, and Nancy J. Moules. 2017. “Thematic Analysis: Striving to Meet the Trustworthiness Criteria.” *International Journal of Qualitative Methods* 16(1):1609406917733847. doi: 10.1177/1609406917733847.

Oswalt, Sara B., and Christina C. Riddock. 2007. “What to Do About Being Overwhelmed: Graduate Students, Stress and University Services.” *College Student Affairs Journal* 27(1):24–44.

Pearlin, Leonard I., Elizabeth G. Menaghan, Morton A. Lieberman, and Joseph T. Mullan. 1981. “The Stress Process.” *Journal of Health and Social Behavior* 22(4):337–56. doi: 10.2307/2136676.

Rajgopal, T. 2010. “Mental Well-Being at the Workplace.” *Indian Journal of Occupational and Environmental Medicine* 14(3):63–65. doi: 10.4103/0019-5278.75691.

Rocha-Singh, Indra A. 1994. “Perceived Stress among Graduate Students: Development and Validation of the Graduate Stress Inventory.” *Educational and Psychological Measurement* 54(3):714–27. doi: 10.1177/0013164494054003018.

Shanahan, Lilly, Annekatrin Steinhoff, Laura Bechtiger, Aja L. Murray, Amy Nivette, Urs Hepp, Denis Ribeaud, and Manuel Eisner. 2020. *Emotional Distress in Young Adults during the COVID-19 Pandemic: Evidence of Risk and Resilience from a Longitudinal Cohort Study*. Cambridge: Cambridge University Press.

Scheid, Teresa L., and Tony N. Brown, eds. 2009. *A Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems*. 2nd ed. Cambridge: Cambridge University Press.

Ski Hunter, Mary, and Coleen Shannon. 1987. “Women in Academia: Career Orientation, Satisfactions, and Stress.” *Affilia* 2(1):39–49. doi: 10.1177/088610998700200105.

Wang, Xingmin, Lin Cai, Jing Qian, and Jiaxi Peng. 2014. “Social Support Moderates Stress Effects on Depression.” *International Journal of Mental Health Systems* 8(1):41–41. doi: 10.1186/1752-4458-8-41.

Wheaton, Blair, and Shirin Montazer. 2009. “Studying Social Stress in the 21st Century: Stress Concepts and Research.” Pp. 171–99 in *A Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems*, edited by T. L. Scheid and T. N. Brown. Cambridge: Cambridge University Press

Appendix A: Table 1- Sample Characteristics

Samples size				
	N without criteria	86		
	N with criteria	57		
Gender				
	Male	38.60%		
	Female	61.40%		
Race		Overall	Male	Female
	White	63.79%	47.83%	74.29%
	Black/African American	8.62%	8.70%	8.57%
	American Indian or Alaska Native	0%	0%	0%
	Asian	17.24%	26.09%	11.43%
	Native Hawaiian or Pacific Islander	0%	0%	0%
	Other	10.34%	17.39%	5.71%
Age		32.48	29.12	34.62
Program Type				
	Social Science	36.51%	18.18%	51.43%
	Natural Sciences	19.05%	31.82%	14.29%
	Humanities	3.17%	0.00%	2.86%
	Liberal Arts	7.94%	4.54%	11.43%
	Business	6.35%	4.54%	8.57%
	Professional Program	6.35%	0.00%	8.57%
	Engineering	20.63%	40.91%	2.86%

Appendix B: Table 2- Well-being and Stress

		Mean
How would you rate your _____ well-being?		
(Variables 1 to 5		
Poor,	Overall	3.34
Fair,	Std. Deviation	0.82
Good,		
Great,	Mental	3.07
Excellent)	Std. Deviation	1.05
	Physical	3.23
	Std deviation	0.97
How often do you feel stressed?	Never	0%
	Seldom	1.45%
	Sometimes	37.86%
	Frequently	50.72%
	Always	10.14%
Rate Your Stress		
(1 to 10; 1 being low stress,		
10 being high stress)	2020	6.84
	Std deviation	2.35
	2021	6.87
	Std deviation	1.91
	2022	7.06
	Std deviation	1.69

Appendix C: Table 3- Pandemic

	Overall mean	
Rate Your Stress	2020	6.84
	Std deviation	2.35
(1 to 10; 1 being low and 10 being high)		
	2021	6.87
	Std deviation	1.91
	2022	7.06
	Std deviation	1.69
My coping strategies have changed because of the pandemic.	True	75.71%
	False	24.49%
How much has your life been disrupted by the Coronavirus (Covid) outbreak?		3.45
(1 to 5; negative to positive)	Std. Deviation	1.04
Did you have to move due to the pandemic?	Yes	18.18%
	No	81.82%
How did your relationship change with those you live with?	Mean	4.42
(1 to 5; negative to positive)	Std. Deviation	1.06

		Overall
How did your social relationships change? (1 to 5; negative to positive)		3.79
	Std deviation	1.02
Did your professional development change during the pandemic?	Yes	62.30%
	No	19.67%
	Unsure	18.03%
Did you have to delay plans for graduation?	Yes	35.71%
	No	64.29%

Appendix D: Table 4- Bivariate Analysis

			Men	Women
How would you rate your _____ well-being?				
(Variables 1 to 5 Poor, Fair, Good, Great, Excellent)	Overall	3.34	3.50	3.24
	Std. Deviation	0.82	0.94	0.69
	Mental	3.07	3.27	2.97
	Std. Deviation	1.05	1.25	0.94
	Physical	3.23	3.27	3.23
	Std deviation	0.97	1.09	0.76
How often do you feel stressed?	Never	0%	0%	0%
	Seldom	1.45%	4.55%	0%
	Sometimes	37.86%	31.82%	37.14%
	Frequently	50.72%	54.55%	51.43%
	Always	10.14%	9.09%	11.43%
Rate Your Stress				
(1 to 10; 1 being low stress, 10 being high stress)		Overall	Men	Women
	2020	6.84	6.50	7.09
	Std deviation	2.35	2.69	2.09
	2021	6.87	6.45	6.94
	Std deviation	1.91	2.46	1.49
	2022	7.06	7.09	7.14
	Std deviation	1.69	1.98	1.33

		Overall	Men	Women
My coping strategies have changed because of the pandemic.	True	75.71%	63.64% (14/22)	80.00% (28/35)
	False	24.49%	36.36%(8/22)	20.00% (7/35)
How much has your life been disrupted by the Coronavirus (Covid) outbreak? (1 to 5; negative to positive)		3.45	3.41	3.40
	Std. Deviation	1.04	1.03	0.93
Did you have to move due to the pandemic?	Yes	18.18%	22.22% (4/22)	11.43%(4/35)
	No	81.82%	81.82% (18/22)	88.57% (31/35)
How did your relationship change with those you live with? (1 to 5; negative to positive)	Mean	4.42	4.45	4.51
	Std. Deviation	1.06	1.20	0.94
How did your social relationships change? (1 to 5; negative to positive)		3.79	3.68	3.74
	Std deviation	1.02	1.10	0.97
Did your professional development change during the pandemic?	Yes	62.30%	87.50%	66.67%
	No	19.67%	12.50%	33.33%
	Unsure	18.03%		
Did you have to delay plans for graduation?	Yes	35.71%	40.90%	32.35%
	No	64.29%	59.09%	67.65%

		Overall	Men	Women
Program Type				
	Social Science	36.51%	18.18%	51.43%
	Natural Sciences	19.05%	31.82%	14.29%
	Humanities	3.17%	0.00%	2.86%
	Liberal Arts	7.94%	4.54%	11.43%
	Business	6.35%	4.54%	8.57%
	Professional Program	6.35%	0.00%	8.57%
	Engineering	20.63%	40.91%	2.86%
How satisfied are you with your _____?				
(1 to 5; not at all, somewhat neutral, very, extremely satisfied)				
	Overall Program	3.38	3.55	3.23
	Std deviation	0.97	0.78	0.99
	Assistantship	3.13	3.09	3.15
	Std deviation	1.18	1.28	1.13
	Classes	3.15	3.32	2.97
	Std deviation	1.04	0.82	1.09
	Professional development	3.10	3.00	3.12
	Std deviation	1.16	1.13	1.16

	Overall	Men	Women
If you had an assistantship			
(1 to 5; never, rarely, sometimes, often, always)			
How often did you feel overwhelmed?	4.06	4.19	3.96
Std. deviation	1.21	1.18	1.23
How frequently did your assistantship pertain to your career path?	4.52	4.50	4.54
Std. deviation	1.31	1.32	1.31
How frequently did you go over your hours?	4.18	4.30	4.08
Std. deviation	1.42	1.38	1.44
How frequently did your assistantship interfere with your classes?	3.39	3.50	3.31
Std. deviation	1.15	1.12	1.17
How frequently did your assistantship Interfere with your personal life?	3.67	3.65	3.69
Std. deviation	1.14	1.19	1.10
Did your assistantship interfere with your work-life balance?	3.96	3.95	3.96
Std. deviation	1.38	1.36	1.40

Appendix E: Table 5- “What part of your life causes you the most stress?”

School	45.16%
Work	24.19%
Work/Life Balance	22.58%
Finances	8.06%
Immigration	3.22%
Politics	3.22%
Isolation	1.61%
The Future	1.61%