AN EXAMINATION OF SOCIAL SUPPORTS DURING

GRADUATE SCHOOL AND HOW THEY MODERATE

STRESSORS, ANXIETY, DEPRESSION,

FLOURISHING, AND POSITIVE WELL-BEING

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As someone who has been on a journey of breaking down the walls of the fortress self-built to protect me from hurt, I cannot express enough how grateful I have been to watch brick by brick fall as I allow people into my castle—my home—my safe place. Through deeper reflection, it is no accident that I would choose a topic to study that revolves around mental health and the undeniable benefit of social support. Pain and mental health struggles have littered my past, but nothing has been better for cleaning my path to a healthier now and future than those who have walked beside me picking up all hurt and replacing it with a new view to a beautiful world. Thank you to all past and present supporters in my life.

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Abstract: Considering the significant number of graduate students (nearly 4.1 million in the U.S.) and the apparent lack of contemporary research on graduate students and mental health, this study strove to apply past research to an understudied population with hopes of sparking action for institutional change and change to a proactive versus reactive approach to mental health care. This study examined both negative and positive mental health outcomes of graduate students and how those outcomes were impacted by stressors and social support. An online survey broken into sections over stress, mental health, and social support was sent to all graduate students at a four year institution. The sample size was 260; an important note is that missing data analysis has not yet been conducted. The mean age was 31 years old, 67.50% of participants identified as a cisgender woman, 52.92% were out-of-state students, and half of the sample reported excellent or good physical health. Pearlin et al.'s (1981) stress process model was applied to the stressors, social support, and mental health of graduate students. Aneshensel and Uchechi (2014) summarize how beneficial the stress process model has been in stress research due to the study of what influence our social environments have on exposure to stressors, how the variance of access to personal and socials resources can play, and the roles of moderators on the effect of stressors on mental health. The following hypotheses were confirmed: graduate students who experience more stressors will have higher anxiety and depressive symptoms and lower flourishing and positive well-being; graduate students who have stronger social support will have lower levels of mental distress. These findings may serve as a starting place for discussing and discerning intervention practices to implement in graduate school to enhance and improve the mental health of graduate students and doing so from a positive well-being approach.

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CHAPTER I

INTRODUCTION

Feelings of anxiety and depression are common, with most people experiencing them at least once in their adult lives. "Anxiety disorders are the most common mental illness in the U.S., affecting 40 million adults…nearly one-half of those diagnosed with depression are also diagnosed with an anxiety disorder" (ADAA 2018). Anxiety and depression are interconnected mental health challenges, as they often result in "impaired health-related quality of life" (Strine et al. 2008:1383) and can adversely affect a person's day to day interactions with their social environments like work, school, relationships, and social activities (Bosc 2000). In 2019, the United States Census Bureau determined there were nearly *4.1 million* students enrolled in graduate school. Graduate students are six times more likely to experience anxiety and depression when compared to the general population (Evans et al. 2018). Past studies on the mental health of college students have largely focused only on undergraduates or a combined evaluation of undergraduate and graduate students (Garcia-William, Moffitt, and Kaslow 2014). Studies also heavily emphasize the negative attributes of mental health or the impact poor mental health can have on everyday living. This study, however, expands this focus by delving into positive mental health and what can contribute to more beneficial mental health despite the unique stressors faced by graduate students. This overemphasis on the negative is prevalent in society, but there is great benefit in highlighting what all human-beings are doing right. The ability of a person to flourish and experience positive well-being in stressful circumstances can serve as a useful template for navigating the distinctive challenges of graduate school. By focusing solely on isolated mental

challenges, institutions can only hope to reduce negative mental health rather than promoting positive mental health. The positive mental health of graduate students is vital to their success in higher education as well as promoting institutional goals. Graduate students often serve as teaching assistants who provide a great deal of undergraduate instruction; they also can play an important role as research assistants (Austin 2002). Both of these graduate student roles come with teaching and research responsibilities that directly impact institutional success whether educationally or monetarily.

The research question of this study is as follows: To what extent does social support moderate the effects of stress on depression and anxiety, and promote flourishing mental health among graduate students? This research question will be addressed by assessing the prevalence of self-reported symptoms of anxiety, depression, flourishing, and positive well-being among graduate students (Masters & PhD) at Oklahoma State University through a survey containing various scales measuring anxiety, depression, and flourishing. Flourishing processes can "occur through the reduction or elimination of stressors" (Thoits 1999:106). This research will also examine the prevalence of graduate school-related stressors and financial stress experienced by graduate students and how those stressors are moderated by social supports. Thoits (1999) discussed how strong social supports can promote the ability to flourish. One productive way of measuring positive functioning and well-being is by applying Keyes's framework on flourishing to the graduate student population. In short, an individual who is flourishing is experiencing positive mental health due to more effectively functioning compared to those who are struggling more (Keyes 2007). Studies have shown the positive influence of flourishing, but there is little known in the literature on how graduate students experience flourishing and this study aims to bridge that gap.

Studies have indicated negative events based off participants' perceptions are strongly associated with adverse mental health outcomes when compared to positive events (Thoits 2010). One way

individuals can successfully counter enduring negative events is through the development of social supports. The presence of social supports involves "the belief that when one has problems, one has someone to talk to who is supportive and understanding" (Ross and Mirowsky 1989:208). Researchers have documented how social supports can buffer the negative impact stressors (i.e. aspects of life that give rise to stress) have on well-being among the general population (Thoits 2010). Research also shows how social supports can have a significant impact on reducing depressive symptoms and diminishing feelings of distress (Ross and Mirowsky 1989).

The data will be analyzed by applying Pearlin et al.'s (1981) stress process model. The stress process model examines the background of stress (e.g. an individual's location in a social structure), sources of stress along with the mediators and manifestations of stress (Pearlin et al. 1981). The stress process model examines multiple levels of social influence—individual, social, interpersonal, environmental, etc. The stress process "helps to highlight the structural arrangements of the society and its institutional forces that affect people's lives" (Pearlin et al. 1990:590). Research is needed to work toward discovering and building ways to not only combat mental health challenges, but apply what works to promote mental health by also researching flourishing and positive well-being. This can come about through the reduction or elimination of stressors as well as strengthening social supports (Thoits 2009) in graduate school. As discussed by Garcia-Williams et al. (2014), more research is needed on focusing on the development and evaluation of mental health among graduate students, as well as, working to establish wellness interventions. Wellness interventions could lead to healthier graduate students who can better function in their roles as teaching and research assistants and are more likely to experience academic success.

By applying a sociological lens to mental health during graduate school, we can acknowledge the structural and social challenges that exist for graduate students and in turn work to create strong and effective interventions. Findings from these analyses will help to inform programming to

promote and support students' mental health in graduate school. Particularly in light of the global pandemic of COVID-19 and its detrimental impacts on higher education and people's mental health, it is vital to better understand graduate student's mental health challenges and how their flourishing can be supported on multiple levels.

Considering the significant number of graduate students and the apparent lack of contemporary research on graduate students and mental health, this study strives to apply past research to an understudied population with hopes of sparking action for institutional change and change to a proactive versus reactive approach. This proactive approach involves supporting those individuals who are healthy as well as those who are struggling, and discern what elements facilitates positive emotional, psychological, and social well-being. Considering graduate students are distinctively integral to research teams that can have an impact on scientific contributions (Levecque et. al., 2017), we need to examine what mental health issues exist and what processes could help alleviate mental health struggles and encourage flourishing and positive well-being among all graduate students.

CHAPTER II

REVIEW OF LITERATURE

Mental Health and Graduate Students

When conceptualizing mental health, an examination of more than mental health challenges alone is necessary. Research has extensively studied the absence of mental health along with the impacts of negative well-being; however, the overemphasis on mental health struggles limits understandings of whole-person health, particularly as it relates to positive well-being. Keyes (2007) points out the benefits that can arise from a thorough examination of a state of well-being where one comes to realize their abilities to adapt and cope with the stressors of life while finding ways to be productive, contribute to one's community, and be successful in spite of daily stressors. Emphasizing the actions effectively done to induce positive mental health warrants merit and further scholarly attention among populations exposed to distinctive stressors like graduate students.

The age of full-time graduate students varies among public and private nonprofit institutions, but the majority are under the age of 30 and roughly 30% of those students are younger than 25 years old (NCES 2020). While the focus of this study is not on any particular age group, there are distinctive and important elements of the developmental aspects of graduate school both emotionally and professionally. Arnett (2000:469) argues that the emerging adulthood years between 18 and 25 are formative, involve profound change, and often revolve around obtaining the education and training "that will provide the foundation for their incomes and occupational achievements for the remainder of their adult work lives (Chisholm & Hurrelmann. 1995;

William T. Grant Foundation Commission on Work, Family, and Citizenship, 1988)." Relatedly, the age group that is hit the hardest with anxiety and depressive symptoms are 18-25 year olds within the realm of emerging adulthood. This indicates that more knowledge on college students' experiences can have a significant impact on mental health policy seeing as they are often at the age of first onset for mental disorders which can have long-term effects on them individually and their future careers (Eisenberg et al. 2009).

Stigma surrounding mental health is still prevalent which in turn can create a reluctance among graduate students to seek help. Part of this reluctance is due to the fear of experiencing a negative impact on one's current path as a student as well as one's future career (Levecque et al. 2017). This perception of academic jeopardy among graduate students can instill a deep hesitance to communicate struggles with colleagues and instructors. Until institutions and society tear down the walls constraining open, productive dialogues surrounding mental health, change will be minimal and negative mental health will continue to worsen among the most vulnerable social groups. Not only are there walls around some individual's mental health, there are barriers to the paths of positive well-being. These barriers can include "lack of time, perception of academic jeopardy, concern regarding confidentiality, the stigma of mental illness, and cost" (Dyrbye et al. 2005:1614). Tearing down these barriers while facing day to day stressors can inhibit the ability of someone to seek help, so how are those who are flourishing able to overcome such barriers and experience positive well-being? Flourishing can better allow a person to have a stronger reliance on social support, better express emotions, and enhance problem-solving skills (Dyrbye et al. 2005). When an individual is flourishing, they are enabled to respond to stressors in a way that

lends to adaptation which can reduce the number of anxiety and depressive symptoms they experience which can impact their mental and physical health (Dyrbye et al. 2005:1614).

Stressors are external circumstances that can block or challenge a person's ability to cope (Aneshensel and Mitchell 2014). Stressors can have a collective and cumulative impact on mental health. With mental health being linked to an individual's ability to socially function and connect, academically perform, and secure future economic productivity (Lipson et al. 2016, then it is clear research on graduate student's mental health is needed. Stressors can illicit physiological responses which can entail feeling endangered, overwhelmed, and/or frustrated which can manifest in symptoms of anxiety and depression (Aneshensel and Mitchell 2014).

Anxiety

According to the National Institute of Mental Health (NIMH), symptoms of anxiety vary but can include fatigue, irritability, restlessness, muscle tension, sleep problems, and more (NIMH 2019). Symptoms of anxiety can occur when a stressor (problematic experience) leads to stress which is a physiological response to a stressor. This response can come in the form of anxiety or feelings of anxiety. Examples of stressors that could leave a graduate student feeling fatigued or like their efforts are thwarted are the pace of change, financial insecurity, and pressure to publish. While occasionally experiencing anxiety is a part of day to day life, those experiencing persistent and seemingly uncontrollable anxiety are likely facing an anxiety disorder and anxiety symptoms can interfere with a person's daily activities like studying, researching, teaching, and relationships (ADAA 2018 and NIMH 2019). The Anxiety and Depression Association of America (ADAA) found a national prevalence of roughly "40 million people in the United States (18%) experience an anxiety disorder in any given year" (ADAA 2018). A recent study led by Saul & Fish (2019)

used 2016 data from the American College Health Association that indicated roughly 62% of *college students* reported experiencing anxiety within the past 12 months. Notably, the population of college students studied were predominantly undergraduates with only 13.9% being graduate or professional students (American College Health Association Study 2016). More data still needs to be collected on graduate students to discern their unique experiences, so this study contributes by focusing on self-reported symptoms of anxiety experienced while in graduate school.

Anxiety has been linked to performance decrements in cognitive tasks (Tohill and Holyoak 2000) and can negatively impact academic performance (Cassady and Johnson 2002). A study on the mental health and suicidal behaviors among graduate students concluded "graduate students experience significant amounts of stress and anxiety" (Garcia-Williams et al. 2014:554). Despite the results of the study, it was limited in its study population and the authors advised not to apply this to the graduate population as a whole due to low response rate and a lack of diversity in the sample. While studies do exist on the negative impacts of anxiety and its presence in the college student population, more research is needed to better determine the key variables which impact the prevalence of anxiety in the graduate student population. More understanding is also needed on what dynamic factors can play a role in reducing anxiety prevalence (e.g. social support) and potentially promoting positive well-being.

Feelings of anxiety can have a negative impact on graduate students by constraining attention spans (Fredrickson and Thomas 2002), which can adversely impact academic success. Conversely, experiencing a more positive state of mind like flourishing can broaden attention spans, spark creativity and flexibility, and enhance cognitive function all of which will likely

improve the productivity and contributions made by graduate students as research and teaching assistants (Fredrickson and Thomas 2002). Facilitating an environment of flourishing can also improve one's ability to cope with stressors and build resilience (Fredrickson and Thomas 2002). Feeling afraid, worried, or irritable are symptoms of anxiety while feelings of sadness, worthlessness, and hopelessness are feelings of depression (Mirowsky and Ross 1986), and these symptoms are often co-occurring and mutually reinforcing (Dyrbye et al. 2005).

Depression

Depression can cause symptoms that impact a person's mental health challenges like sleeping patterns, eating habits, how one feels and thinks, and suicidal ideation. A 2017 study done by NIMH estimated nearly 17.3 million adults in the U.S. had experienced at least one major depressive episode (MDE). A MDE is when the symptoms of depression (e.g. feelings of hopelessness, fatigue, lack of motivation) are experienced for two consecutive weeks or longer. Depression is one of the most common mental disorders in the country (NIMH 2019) and a leading cause of decreased work productivity (Kroenke et al. 2009). With the hardest hit age group being between 18-25 years old and with 30% of graduate students being under the age of 25, identifying and treating depression early is key to effectively reducing its potential of negative life-long impacts as well as potentially facilitating healthier professional careers inside and outside of academia. Depression can be successfully treated and the earlier the treatment, the higher likelihood of effectiveness in reducing and eliminating symptoms (NIMH 2019).

"Depressive symptoms in students can compromise learning and memory processes, adversely affecting academic performance (Hysenbegasi, Hass, & Rowland, 2005), and suicidal ideation (Garlow et al., 2008)." (Peluso, Carleton, and Asmundson 2011:119). This study will examine a

sample of graduate students and their self-evaluation of depressive symptoms through various validated scales in an electronic survey. While this is only a segment of the broader population, additional research on the mental health and well-being of graduate students is needed as there are nearly 4.1 million graduate students (U.S. Census Bureau 2019) and their social environment is distinctively stress-laden with limited support resources (Evans et al. 2018). Some graduate students are not equipped with the necessary skills to recognize personal distress and are unable to fully develop strategies to promote their own positive well-being (Dyrbye et al. 2005) which is just one justification for more supportive resources in higher education being necessary and valuable. Having a supportive college environment, a sense of belonging, professional confidence, and civic engagement are all examples of positive well-being/flourishing (Fink 2014). Enhancing these features in graduate school could reduce feelings of depression and increase a student's ability to cope while being a more productive member of higher education. In a study conducted by Keyes (2006:395) about mental health during adolescence, depression is often related to a "downward spiral in…quality of academic performance". While this study focused on earlier development age periods, the same process could potentially be present among graduate students as they are still emerging into adulthood and establishing their professional life trajectories; however, research is still needed to determine how specific mental health challenges, like depression, are impacting graduate students and how they may also be flourishing and succeeding in the face of adversity.

Overwhelming evidence has shown those who are free from major depression "function better and are more productive" (Keyes 2005:539). With graduate students playing a large role in research productivity at universities (Feist 1997) and with research potentially being a pivotal part

of their future life chances regarding their degree and career path, then depression should be a major concern related to students' mental health, but also the potential institutional monetary costs incurred by lower productivity. Structurally, graduate school is characterized by distinctive academic expectations that often drive competition and hierarchies, which can influence stressors and mental health challenges, such as anxiety and depression, if students struggle to meet those expectations. One of the expectations of a graduate student can be to work toward producing publications which are "essential for securing institutional and federal funding" (Peluso et al. 2011) and therefore critical to shaping career opportunities. "Depression costs billions each year due to work absenteeism, diminished productivity, healthcare costs..." (Keyes 2002:207). Student attrition comes with an extreme monetary cost, but it can also be accompanied by an immeasurable personal disruption to the student (Gardner 2008).

Aneshensel and Stone (1982) foundationally concluded that depression decreased among those who had an increased number of relationships and an increase in perceived social support. A major goal of this study is to determine the influence social bonds have on mental health outcomes. Research has determined that social support can buffer depression (Ross and Mirowsky 1989), but few studies examine this at the graduate level and determine what type of social supports play detrimental roles. Since graduate students are faced with significant pressure to meet the elevated, often rigid, expectations of graduate programs, it is critical to examine what factors can mitigate feelings of distress (i.e. anxiety and depression) to help them better succeed as students and professionals. A recent study done by Evans et al. (2018:283) showed that "strong, supportive and positive mentoring relationships between graduate students and their PI/advisors correlate significantly with less anxiety and depression." More studies are needed to

determine the influence of other social bonds on depression and mental health functioning. Research on doctoral students has stressed that due to a lack of time, financial resources, and motivation, students report difficulties in maintaining relationships (Sverdlik et al. 2018). Gaining more knowledge on who can help reduce depression among students is just one way for an institution to yield higher productivity and promote graduate student success and future career well-being. Additionally, evidence exists suggesting that positive views and relations with advisors "were associated with greater self-efficacy with respect to research" (Peluso et al. 2011:120). Therefore, an examination of how beneficial and supportive social resources among graduate students is necessary to provide a more complete picture of their well-being during a formative developmental period and discern factors that promote positive growth, mental health, progress, and success.

Flourishing and Positive Well-Being

In mental health research, more attention tends to be paid to the negative attributes of life experiences. Research often delves deep into adverse mental health outcomes like anxiety and depression, however, there is much to be learned from examining the positive attributes of life. As discussed by Keyes et al. (2012), mental health is not only about negative functioning but also consists of symptoms of positive functioning which is known as flourishing; flourishing is vital to complete mental health (i.e., the absence of mental illness) (Keyes 2005). The absence of mental illness like anxiety or depression is not indicative of holistic mental health; instead, an individual who is flourishing is experiencing positive mental health due to functioning markedly better in meeting their life goals, such as being successful in a graduate program, compared to those who endure more mental health challenges (Keyes 2007). An individual experiencing anxiety and/or

depression could still be flourishing as people's mental health status is variable, fluctuating, and is closely tied to their structural resources, ascribed statuses, family history, and life chances (Pearlin et al. 1990). What data exists on college students predominately lends its attention to negative outcomes like anxiety and depression. Knowledge of flourishing among graduate students is relatively absent, and this gap is problematic as it obscures understanding of how students are succeeding and experiencing positive well-being. This information is key to informing interventions and preventative measures against mental health challenges like depression and anxiety. By utilizing Keyes' mental health continuum scale, the strength of social supports can be examined for their impact on mental health among graduate students and discern if students are mentally healthy/flourishing while in graduate school. The Mental Health Continuum scale determines the "emotional well-being and positive functioning, psychological well-being, and social well-being" (Keyes et al. 2012:126). The mental health continuum consists of complete mental health (flourishing) and incomplete mental health (languishing). Languishing in life involves diminished well-being that can involve feelings of emptiness and stagnation (Keyes 2002). In a study of roughly 3,000 adults ranging from 25-74 years of age, "flourishing individuals were over 5 times less likely than languishers to have MDE" (Keyes 2005:545).

The breakdown of positive functioning of psychological well-being is comprised of five dimensions; however, this study will focus primarily on one, positive relations with others, which entails warm and trusting relationships (Keyes 2002). Social scientists view mental health through investigating subjective well-being. "Subjective well-being is individuals' perceptions and evaluations of their own lives in terms of their affective states and their psychological and social functioning" (Keyes 2002:208). Social functioning can be examined through Keyes

(2002:209) five dimensions of social well-being: "social coherence, social actualization, social integration, social acceptance, and social contribution". Evidence suggests that flourishing is "a desirable condition that any community, corporation, or government would want to protect or promote in its citizens" (Keyes and Michalec 2010:132). Ideally, universities regard their graduate students in similar ways. Fink's (2014) study of college students indicated that supportive college environments foster flourishing. The strength of social bonds, therefore, could be one way flourishing is shaped among graduate students. A deeper understanding of how social support shapes graduate students' well-being can prompt a cultural shift in the sphere of graduate studies; effective applications for reducing negative mental health for graduate students is greatly needed among institutions and for some, long overdue. Institutionally, graduate students significantly contribute to the research community by being major sources to scientific advancement and mental health challenges are likely to negatively affect the output of research done by graduate students (Levecque et al. 2017). As determined by Fredrickson and Joiner (2002:172), positive emotions can lead to both enhanced emotional well-being, and "broaden attention and cognition." Enhanced cognitive ability can only strengthen the work produced by a graduate student and their future educational/career success. Positive emotions can influence and positively impact coping ability. As one develops more effective coping strategies, their resilience (adapting to adverse life events) and emotional well-being can improve (Fredrickson and Joiner 2002). Students who struggle with mental health issues and stress may be less productive and beneficial to the success of their individual department and broader educational institution (Levecque et al. 2017).

CHAPTER III

METHODOLOGY

The Stress Process

Day to day life is peppered with stressors that in turn lead to stress, which can evolve into

distress. Even then, life is not as spicy as often presumed. Studies measuring stress and hundreds

of types of stressors showed that "even the most common assumed stressors, 'taking on too many

things at once,' was only reported by 44% of the sample" (Wheaton and Montazer 2010:191).

This illusion that stress is being served as frequently as our daily meals leads to a bias toward

perception of problems and negates their diminishment. This, in turn, suggests stress as a constant

in one's life and therefore "cannot really be involved casually in the development of mental

health problems" (Wheaton and Montazer 2010:191). Here lies one reason for the application of

the stress process model. To understand the role stress (a biological response) plays in our lives

from a sociological perspective, a breakdown of the stressors involved is necessary. Additionally,

stressors do not always lead to a biological response, but can still be present. "To provide focus in

the psychosocial approach to stress, we argue that it is more important to define stressors than

even to define stress" (Wheaton and Montazer 2010:173). By only studying stressors in isolation

from flourishing and positive well-being, understanding is limited because people often

experience them simultaneously in their lives.

The main theoretical approach being utilized is the stress process model presented by Pearlin et al. (1981) as it applies to the stressors, social support, and mental health of graduate students. The stress process is grounded in social origins due to the process being based on the "production of and life consequences of stress" (Brown and Scheid 2010:192). Aneshensel and Uchechi (2014) summarize how beneficial the stress process model has been in stress research due to the study of what influence our social environments have on exposure to stressors, how the variance of access to personal and socials resources can play, and the roles of either/or moderators and mediators of the effect of stressors on mental health. The stress process is broken down into four domains: background and context of stress (ascribed statuses, family history, etc.), "the sources of stress [stressors], the mediators of stress, and the manifestations of stress" (Pearlin et al. 1981:337). Stressors as defined by Pearlin and Jacobson (1989:243), "refer to the experiential circumstances that give rise to stress". In the context of the present study, one can exchange generalized stressors (i.e., role captivity, ascribed statuses, etc.) for graduate school stressors (e.g. pace of change, relationships with faculty, increased workloads, financial insecurity, etc.). The sources of stress (stressors) in the present study are measured by existing validated scales with the main focus being on graduate school stressors and financial stress. The main moderator of stress being examined is social support. The stress process model allows for an analysis of how effective social support is in mitigating the effects of stress on a person's mental health. Figure 1 illustrates the relationships being examined in this study.
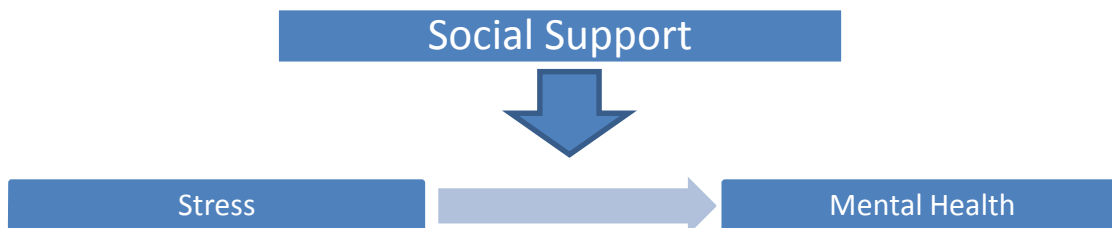

Figure 1. Stress Process Model of Mental Health.

The manifestations of stress can be exemplified by students experiencing anxiety and/or depression. By highlighting the various stressors (e.g. pressure to publish, frequent evaluation, workload) involved with graduate school and the existence of social supports, it can be better determined if a student is flourishing on the mental health continuum which can help predict a student's success and well-being in graduate school as well as later in life (Keyes 2002).

Sources of Stress: Stressors

Stress is a physiological response brought on by a stressor; stress can then evolve into distress which is a behavioral response that can manifest into depression and/or anxiety (Aneshensel and Uchechi 2014). The external threats, challenges, demands, and/or structural drivers of stressors are external. Stressors are the impetus to stress and distress. Stressors are "the conditions, experiences, and activities that are problematic for people; that is, that threaten them, thwart their efforts, fatigue them, and defeat their dreams" (Pearlin et al. 1990:586). By taking a sociological approach, research can show how stressors as socially patterned. Sociological inquiry involves looking at the structural origins and societal influences of stressors (Pearlin 1989). Seeing as stressors are "involved in a dynamic interplay of causation over time" (Wheaton and Montazer 2003:178) which can result in the spreading or containment of stress in a person's life, identifying the means to combat stressors or at least buffer their impact is valuable to those struggling with anxiety and/or depression or even prevent distress from occurring in the first place.

Financial strain have been shown to be a significant source of stress as well as increasing the risks of depression among undergraduate students (Serido et al. 2010). Financial strain can also increase attrition rates among college students (Serido et al. 2010). There is limited research on financial stress and strain of graduate students to confirm or deny similar results. Serido et al. (2010) did a study with 2,098 first-year students that pointed out "the important role that interactions with parents can have in the responsible financial decisions" made by those first-year students. A similar question could be posed with graduate students in determining whether

parental roles are major contributors to financial stress in graduate school or if financial stress is based more on income. A study by Stein et al. (2013) on 222 young adults attending college showed that students who had to make more economic adjustments reported higher levels of depressive and anxiety symptoms. Communication and education on financial coping strategies were shown to reduce depressive and anxiety symptoms (Stein et al. 2013). With graduate students moving out of young adulthood, they could be taking on more financial strains and still be lacking the financial coping strategies necessary to flourish.

While stressors can lead to distress that impacts mental well-being, stressors can also destabilize educational performance and cause disruptions in one's professional capacity (Wheaton and Montazer 2010). Importantly, a stressor can be a persistent and continuous problem (Wheaton and Montazer 2010:175). Another crucial element of stressors is that not everyone experiences them the same way or has similar outcomes. Studies on graduate students and stressors are few in number and limited in scope. In one study on psychology graduate students, nearly 71% reported experiencing a stressor that affected their optimal functioning during their time in graduate school (Bamonti et al. 2014). Findings from Myers et al. (2012:56) showed students of color experiencing additional stressors including "racial discrimination, racial prejudice, feelings of isolation, and different cultural expectations," which influenced higher rates of depressive symptoms. More research is still needed on graduate students and the stressors they face along with how those stressors impact their educational success and mental health. Two ways to moderate negative mental health outcomes is to reduce or eliminate stressors and bolster personal resources like social support (Horwitz 2010). By examining flourishing and positive well-being, information can be gleaned on how to reduce stressors and enhance social support.

Moderators of Stress: Social Support

Social support in stress research has been shown to affect one's ability to cope and therefore, lessen the impact of stressors (Aneshensel and Uchechi 2014). Research has indicated that people

who are socially integrated are "less likely to develop mental health problems [and] they are also better able to cope with stressful experiences that they face [due to receiving] more social support" (Horwitz 2010:10). Social integration involves the existence of social ties (Heaney and Israel 2008). Those who are socially integrated and have social support have significant others who are there for them in times of need and offer support (Wilks and Spivey 2010). "Social integration is associated with positive mental health - humans derive satisfaction from valued intimate relationships and suffer when their circumstances deprive them of these relationships" (Horwtiz 2010:11).

Social support as defined by Pearlin and Jacobson (1989) includes the resources one uses when managing life challenges. As presented by Heaney and Israel (2008), social support can improve a person's ability to access and establish new social networks which in turn can lead to acquiring more information while developing problem solving skills as well as strengthen an individual's social capital. These social networks can then help a person establish a sense of belonging to a community and potentially create trusting personal relationships, both of which are elements of flourishing. These social networks and problem-solving skills can likely benefit both the student and the department in which the student is producing work. Levecque et al. (2017) asserted need to redirect focus from hard outcomes like publications to soft outcomes like the influence of stress on producing publications. Stress could reduce the success level of producing publications which in turn could result in a negative productivity cost for the department and/or university and the student. Stressors are not always controllable, but the building of social bonds can be directly supported/promoted. Kaplan et al. (1977) discussed how strengthening social support was often more practical in preventing disease versus trying to reduce the occurrence of stressors. This mentality of strengthening the positive aspects of life could induce more flourishing and positive well-being among graduate students which in turn allow them to be more successful in the academic journey.

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Manifestations of Stress/Outcomes: Anxiety and Depression

Outcomes of stress can be well-being, physical and mental health, and the ability to sustain themselves in their social roles (Pearlin et. al., 1990). This study focuses on depressive and anxiety symptomology self-reported by graduate students. These outcomes are not interchangeable; instead they should be treated as interrelated. Another outcome of stress can be positive mental health like flourishing. If one experiences flourishing, they could then better succeed in their social roles, as well as, experience better physical health.

More attention on the social institution of graduate school and the interpersonal relationships experienced by graduate students, and a more encompassing explanation of "exposure to stressors, access to resources that may influence the impact of stressors, and mental health outcomes" (Aneshensel and Uchechi 2014:59) can result in more productive and holistically healthy graduate students. Because graduate students are distinctively integral to research teams (Levecque et al. 2017), and anxiety and depression can constrain attention spans (Fredrickson and Thomas 2002), more knowledge on reducing and/or eliminating stressors is needed.

Based on prior literature and the stress process model, I will test the following hypotheses:

H1) Graduate students who experience more stressors will have poorer mental health (i.e., higher anxiety and depressive symptoms, lower flourishing and positive well-being).

H2) Graduate students who have stronger social support will have lower levels of mental distress.

H3) Graduate students who have stronger and/or more social support will experience better mental health (i.e., flourishing and positive well-being).

H4) Graduate students lacking social support will experience more symptoms of anxiety and/or depression as outcomes of stress.

CHAPTER IV

FINDINGS

Data

This study adopted a quantitative methodological approach. The data were collected from a
survey built in the web-based survey tool, Qualtrics. The survey consisted of existing reliable and
validated scales for social support, stress/stressors, and mental health, along with standard
demographic questions. A variety of scales was utilized to better encompass as many potential
stressors experienced by graduate students. The survey was divided into six sections with the
demographic questions split between the first and fifth sections. The demographic questions were
similar to those used in the 2010 and 2020 U.S. Census surveys. The second, third, and fourth
sections were as follows: social supports, stress and stressors, and mental health. The last section
was made up of three open-ended questions asking participants what they might want to see
changed within the university setting when looking at social support, stress, mental health, and
the university's response to COVID-19. Each section ended with a qualitative question to provide
more agency among graduate students and to inform future research directions. This survey was
approved by the university IRB. Respondents were invited to participate via email, and the target
population included all current Oklahoma State University (OSU) students classified as studying
at the graduate level on April 2nd 2020. Therefore, both Masters and PhD students were sampled
together. Participants were required to agree to a consent form in order to begin the survey and

their identity and responses were anonymous. The average survey time was between 20-30 minutes. To mitigate respondent fatigue, a pilot test was distributed to a small sample of OSU graduate students, with feedback garnered on duration, strain, general flow, and minor corrections used to make necessary adjustments. The pilot test also assured the questions asked were relevant to the sample and the overall goals of the study.

The email invitation was sent to 2,923 OSU graduate students of which 260 students completed the survey according to the survey tool, Qualtrics. Additionally, not all respondents who started the survey completed it, leading to missing data due to attrition. Therefore, missing data analysis still needs to be conducted to fully assess whether meaningful differences exist between those who completed the survey, those who did not respond, and those who dropped out of the survey. According to OSU's Institutional Review Board, survey response rates tend to be around 10% and when using the numbers from Qualtrics, the response rate was 8.89%. The following details on the sample population had observation numbers ranging from 155-210. The sample population (see Table 1 in Appendix) is described as follows: The mean age of participants was 31 years old (SD = 7.961). Most of the participants identified as being a cisgender woman (67.50%) (cisgender: when one's gender matches their birth sex), 26.5% identified as being cisgender man, and 1% identified as gender queer/nonconforming/non-binary. Over half (52.92%) reported being out-of-state students and 45.99% were in-state students (1.09% chose not to respond). Most students 43.07% were married or cohabitating with a partner, 19.80% were dating, and 33.17% were single. Half of graduate students reported excellent or good physical health, 36.82% said it was average, and 12.44% said it was poor or terrible.

The following statistics of the student body are from the university's Institutional and Research and Analytics website (https://ira.okstate.edu/studentprofile.html). Unless specified, the population is made up of both undergraduates and graduates. OSU broke down race in the following way: White = 14,741; Black or African American = 871; Hispanic = 1,673; Asian =

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469; American Indian or Alaska Native = 933; Native Hawaiian or Other Pacific Islander = 23; Multiracial = 1,983. Students by department for Spring 2020: Arts and Sciences = 5,285; Spears School of Business = 4,770; Education, Health, and Aviation = 2, 471; Engineering, Architecture, and Technology = 4,077; Ferguson College of Agriculture = 2,759; Human Sciences = 1,273. Students by gender (described as male and female) for Spring 2020: 49.93% male and 50.07% female. Graduate students by residency for Spring 2020: resident = 1,665; nonresident = 937; international student = 869. For Spring 2020, there were 340 Masters and 523 Doctoral international students enrolled at OSU.

Measures

The dependent variables for this study were anxiety symptoms, depressive symptoms, and positive mental health. The General Anxiety Disorder 7-item (GAD-7) Scale is a screening instrument for anxiety disorder and measures the number of *anxiety symptoms* (Spitzer et al. 2006). The GAD-7 Scale was created by Spitzer et al. (2006) to identify GAD and has been presented as a reliable and valid measure to assess generalized anxiety symptoms. The GAD-7 has been widely adopted in studies of college students in other countries (Monteiro et al. 2017) and has been found to be valid and reliable in general population studies (Löwe et al. 2008). The GAD-7 consists of seven questions based partially on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria for GAD and reflects the frequency of symptoms during a two week period. The response options include the following: 1 (not at all), 2 (several days), 3 (more than half the days), and 4 (nearly every day) (see Appendix A). Responses were summed (Cronbach's alpha = .926) and higher values indicate more anxiety symptoms. The scale has been proven as having good reliability and validity through the examination of 2740 adult patients issued the questionnaire by a mental health professional (Spitzer et al. 2006); through an examination of 5,030 participants in Germany (53.3% female) with a mean age (SD) of 48.4 (18.0) years (Löwe et al. 2008); through an examination of adolescents between the ages 12-17

who met the criteria for GAD and their demographic data (age, sex, race/ethnicity) was collected and tested as well (Mossman et al. 2017).

For *depressive symptoms*, the Patient Health Questionnaire (PHQ-9) was used (Kroenke and Spitzer 2002). The PHQ-9 Scale was created by Kroenke and Spitzer (2002) is half the length of other depression measures. The PHQ-9 "consists of the actual nine criteria on which the diagnosis of DSM-TV depressive disorders is based [and is] a dual-purpose instrument that, with the same nine items, can establish provisional depressive disorder diagnoses as well as grade depressive symptom severity" (Kroenke and Spitzer 2002:1). The response options were 1 (not at all), 2 (several days), 3 (more than half the days), and 4 (nearly every day) (see Appendix B). Responses to the nine questions were summed (Cronbach's alpha = .901) and higher values indicate more depressive symptoms. The original PHQ has been well validated in two large studies that involved 3,000 patients and eight primary care clinics (Kroenke and Spitzer 2002). The PHQ-9 has been validated through a study of 857 U.S. college students (Keum et al. 2018).

To measure positive mental health, two scales were included in the survey. The *Mental Health Continuum*-Short Form (MCH-SF) (Keyes et al. 2008; Lamers et al. 2011) consists of 14 items that are summarized and range from 0 to 70, with higher scores indicating greater flourishing (Cronbach's alpha = .928). The response options are on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree) (see Appendix C). "The instrument includes three subscales that assess subjective or emotional well-being (three items), psychological well-being (six items) and social well-being (five items)" (Machado et al. 2015:261-262). The MCH-SF has been validated through a study sample of 686 participants (33.9 years old; education completion and residency) (Machado et al. 2015).

The *Flourishing* Scale is a "brief 8-item summary measure of the respondent's self-perceived success in important areas such as relationships, self-esteem, purpose, and optimism" (Diener et

al. 2010:143). The Flourishing Scale measures social-psychological well-being and is strongly

associated with similar scales (Diener et al. 2010). The items of the scale include aspects of

flourishing such as positive relationships, feeling of competence, meaning and purpose in life,

and engagement with daily activities (Silva and Caetano 2013). The response options are on a 7-

point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Responses to the eight items

were summed (Cronbach's alpha = .907), with scores that range from 8 (strong disagreement with

all items) to 56 (strong agreement with all items) (see Appendix D). A higher score indicates that

graduate students have a positive self-image in important areas of functioning. The Flourishing

Scale has been validated in a study with 478 undergraduate students (66.4% female; mean age

24.55; age range 18-62; discipline, and year of study) (Howell and Buro 2015).

The *Financial Stress* Scale measures four financial stressors (Bray 2001) (see Appendix E).

Respondents were asked whether they had experienced the any of following: pawned or sold

something, could not pay electricity, gas, water, or telephone, were unable to heat or cool home,

and sought financial assistance from friends or family. Affirmative responses were summed into

an overall index of *financial stress*. Cronbach's alpha was .675.

A measure of *graduate school-related stressors* was developed for this study based on prior

literature about stressors relevant to higher education and from feedback provided by graduate

students in the pilot testing stage. The measure includes 21 types of stressors, including struggled

with pace of change and differing teaching styles, felt an increase in workload, to publish papers,

and insecure about unwritten rules and expectations, and experienced Imposter Syndrome (see

Appendix F). The response options ranged from 1 (never) to 5 (very often). Responses to the 21

items were averaged so that higher values indicated more frequent stressors. Cronbach's alpha

was .905.

Social support was examined through the use of the 2-Way Social Support Scale (Shakespeare-Finch and Obst 2011). This instrument measures the dimensions of instrumental and emotional support. This study only focused on *emotional support received* (see Appendix G). The response options include the following: 1 (not at all true) 2 (sometimes true) 3 (often true) 4 (always true). Responses to the seven items were averaged into an overall indicator of emotional support received, with higher values indicating more support. Cronbach's alpha was .890.

The demographic variables used for the study were age, gender, residency status, relationship status, and physical health. *Age* is a continuous measure of age in years. *Gender* was assessed by asking, how do you currently define your gender? The response options include the following: 1 (Cisgender woman), 2 (Cisgender man), 3 (Transgender woman), 4 (Transgender man), 5 (Gender Queer/Gender Nonconforming), 6 (Prefer to not answer), and 7 (Fill in identity). Respondents who did not answer with Cisgender woman and Cisgender man were excluded due to small cell sizes. Gender was coded as a binary variable where 1=Woman and 0=Man. Residency status was a closed-ended question asking if the participant was an *out-of-state* student; 1 (yes) and 0 (no). Relationship status was a closed-ended question asking what best described the participant's relationship status. Three dummy variables were calculated (*married/cohabiting* with partner; *dating*; *single*). Single is the reference category for multivariable analyses. Seven respondents reported another relationship status (0 widowed; 4 divorced; 1 separated; 3 different relationship status). Those respondents were excluded due to their small number. Self-rated *physical health* was assessed with a single question using a 6-point Likert scale ranging from 1 (Poor) to 5 (Excellent).

Analytic Strategy

The statistical analyses will delve into the how the data related to the hypotheses and the overarching research question which is, to what extent does social support moderate the effects of stress on depression and anxiety, and promote flourishing mental health among graduate

students? Standard descriptive summary statistics were used to characterize the results. Univariate

statistics are presented for the distributions and frequencies of study variables. Pearson

correlations are provided to assess the bivariate relationships between the study variables.

Multivariate ordinary least squares regression analyses were conducted to test all hypotheses and

associations among demographics, social support, stress/stressors and mental health outcomes.

All continuous independent variables were mean-centered for multivariable analyses. All

analyses were conducted using Stata (StataSE 15.1).

Results

The univariate analysis was used to summarize and discern patterns in the data. Table 1 in the

appendix indicates the mean, standard deviation, min/max values, and the alphas for all the

independent and dependent variables. For OSU graduate students, the mean for anxiety symptoms

was 16.153% (SD = 6.465); the mean for depressive symptoms was 18.897% (SD = 7.022); the

mean for flourishing was 3.934% (SD = .714); and the mean for positive well-being was 3.429%

(SD = .812). The independent variables, stressors and social support, respectively had the means

of 2.753% (SD = .751) (graduate school-related stressors) and .098% (SD = .204) financial stress

with receiving emotional support being 3.428% (SD = .683). According to the GAD-7, the levels

of anxiety severity range from minimal to severe (Spitzer et al. 2006). The sample in this study

experienced a mean of 16.153% anxiety symptoms meaning they were experiencing mild to

moderate anxiety severity. When breaking down the sample of OSU graduate students and the

level of anxiety severity they experience, 29.47% reported minimal severity, 24.74% mild,

22.11% moderate, and 23.68% severe. According to the PHQ-9, the levels of depression severity

range from minimal to severe (Kroenke et al. 2001). The sample in this study experienced a mean

of 18.90% depressive symptoms meaning they were experiencing mild to moderate depression

severity. When breaking down the sample of OSU graduate students and the level of depression

severity they experience, 25.77% minimal severity, 31.45% mild, 17.01% moderate, 12.88% moderately severe, and 12.89% severe.

Bivariate analysis was used to pinpoint relationships between each of the independent and dependent variables. Once strong relationships were established, then multivariate analysis was applied to the data. Symptoms of anxiety were positively and strongly correlated with symptoms of depression while being negatively and weakly correlated with flourishing and positive well-being. Symptoms of anxiety were negatively and weakly correlated with age, physical health, and receiving emotional support. Financial stress was positively and moderately correlated with symptoms of anxiety while graduate school-related stressors were positively and strongly correlated with symptoms of anxiety. Depressive symptoms were negatively and strongly correlated with flourishing and positive well-being. Depressive symptoms were negatively and weakly correlated with age and being an out-of-state student. Being single was positively and weakly correlated with depressive symptoms. Both physical health and receiving emotional support were negatively and moderately correlated with depressive symptoms. Graduate school-related stressors were positively and strongly correlated with depressive symptoms while financial stress was positively and moderately correlated. Flourishing was positively and strongly correlated with positive well-being. Flourishing was positively and weakly correlated with age. Physical health was positively and moderately correlated with flourishing and receiving emotional support was positively and strongly correlated. Graduate school-related stressors were negatively and moderately correlated with flourishing. Positive well-being was positively and moderately correlated with physical health and positively and strongly correlated with receiving emotional support. Positive well-being was negatively and moderately correlated with graduate school-related stressors and negatively and weakly correlated with financial stress.

Multivariate analysis was used to test the hypotheses. In the following subsections, Model 1 included the control variables. Model 2 introduced the stressors to test hypothesis 1. *Hypothesis*

1: Graduate students who experience more stressors will have poorer mental health (i.e., higher anxiety and depressive symptoms, lower flourishing and positive well-being). Social support was added in Model 3 to test hypotheses 2 and 3. *Hypothesis 2*: Graduate students who have stronger social support will have lower levels of mental distress. *Hypothesis 3*: Graduate students who have stronger and/or more social support will experience better mental health (i.e., flourishing and positive well-being). To test the fourth hypothesis, interaction terms were examined between significant social stressors and social support. *Hypothesis 4*: Graduate students lacking social support will experience more symptoms of anxiety and/or depression as outcomes of stress.

Stress, Social Support, and Anxiety Symptoms

The linear regression results for anxiety are presented in Table 3. For every one unit increase in physical health there was a predicted 2.421 ($p<.001$) decrease (beta = -.328) in number of anxiety symptoms, controlling for age, gender, being an out-of-state student, and relationship status. None of the control variables were associated with anxiety symptoms. Anxiety Model 1 explained 10% of the variance of number of anxiety symptoms.

Stressors were added to the analysis in Model 2. This model tested hypothesis 1 where graduate students who experience more stressors will have higher levels of anxiety. The results in this model confirmed hypothesis 1. For every one unit increase in the stressors faced in graduate school, the number of symptoms of anxiety increased (beta = .442) by 4.053 ($p<.001$). Financial stress was only marginally significant ($p =.075$). After including stressors, residential status became significantly associated with anxiety. When compared to being an in-state graduate student, being an out-of-state graduate student was associated with a predicted 1.846 ($p<.05$) decrease (beta = -.144) in the number of anxiety symptoms. For every one-unit increase in physical health, there was a 1.207 ($p<.05$) decrease (beta = -.157) in the number of anxiety symptoms. Anxiety Model 3 explained 28.9% of the variance of number of anxiety symptoms.

Social support was added to Model 3 to test hypothesis 2. Receiving emotional support is associated with a 1.525 ($p<.05$) decrease (beta = -.160) in the number of anxiety symptoms, supporting the second hypothesis. Graduate school-related stressors remained significantly associated with anxiety, but this relationship was reduced in magnitude compared to Model 2. For every one unit increase in the stressors faced in graduate school, the number of symptoms of anxiety increased by 3.658 ($p<.001$, beta = .398). Being an out-of-state graduate student was only marginally significant ($p =.053$) after accounting for social support, but relationship status became significant. Specifically, compared to being a graduate student who is single, graduate students who were dating were associated with a 2.551 ($p<.05$) increase (beta = .168) in the number of anxiety symptoms. Physical health remained significantly associated with anxiety even after including stressors and social support. Anxiety Model 3 explained 30.6% of the variance of number of anxiety symptoms.

To test Hypothesis 4, that social support buffers the relationship between stressors and anxiety, the interaction between graduate school stressors and emotional support received was examined (not shown in Table 3; interaction with financial stress not tested because the direct effect was not significant). The interaction was not significant, suggesting that the association between graduate school-related stressors and anxiety does not depend on emotional support received.

Stress, Social Support, and Depressive Symptoms

The linear regression results for depression are presented in Table 4. When compared to being an in-state graduate student, an out-of-state graduate student is associated with a 1.971 ($p<.05$) decrease (beta = -.141) in the number of depressive symptoms. Being married is marginally significant (.060) and when compared to being single, being married is associated with a 2.267 increase (beta = -.160) in the number of depressive symptoms. For every one unit increase in physical health there is a 3.309 ($p<.001$) decrease (beta = -.406) in the number of depressive

symptoms. Depression Model 1 explained 21.4% of the variance of number of depressive symptoms.

Stressors were added to the analysis in Model 2. This model tested hypothesis 1, that graduate students who experience more stressors will have higher levels of depression. The results in this model confirmed hypothesis 1. For every one unit increase in the stressors faced in graduate school, the number of symptoms of depressive increase (beta = .441) by 4.289 (p<.001). For every one unit increase in financial stress there is a 5.293 (p<.05) increase (beta = .144) in the number of depressive symptoms. When compared to being an in-state graduate student, an out-of-state graduate student is associated with a 2.453 (p<.01) decrease (beta = -.181) in the number of depressive symptoms. Being married is marginally significant (.060) and when compared to being single, being married is associated with a 1.989 decrease (beta = -.145) in the number of depressive symptoms. Depression Model 2 explained 40.2% of the variance in the number of depressive symptoms.

Social support was added to Model 3. This model to tested hypothesis 2: graduate students who have stronger social support will have lower levels of mental distress. The results in this model confirmed hypothesis 2. Receiving emotional support is associated with a 2.077 (p<.01) decrease (beta = -.206) in the number of depressive symptoms. For every one unit increase in the stressors faced in graduate school, the number of symptoms of depressive increase (beta = .374) by 3.656 (p<.001). For every one unit increase in financial stress there is a 5.186 (p<.05) increase (beta = .135) in the number of depressive symptoms. When compared to being an in-state graduate student, an out-of-state graduate student is associated with a 2.405 (p<.01) decrease (beta = -.176) in the number of depressive symptoms. Depression Model 3 explained 43.2% of the variance of the number of depressive symptoms.

To test Hypothesis 4, that social support buffers the relationship between stressors and depression, I tested the interaction between graduate school stressors and emotional support received (not shown in Table 4; interaction with financial stress not tested because the direct effect was not significant). The interaction was not significant, suggesting that the association between graduate school-related stressors and depression does not depend on emotional support received.

Stress, Social Support, and Flourishing Mental Health

The linear regression results for flourishing are presented in Table 5. For every one unit increase in physical health there is a .284 (*p*<.001) increase (beta = .349) in flourishing. Flourishing Model 1 explained 14% of the variance in flourishing.

Stressors were added to the analysis in Model 2 to test the first hypothesis, that graduate students who experience more stressors will have lower levels of flourishing. The results in this model confirmed hypotheses 1. For every one unit increase in the stressors faced in graduate school, flourishing decreased (beta = -.329) by .330 (*p*<.001). Flourishing Model 2 explained 20.6% of the variance of flourishing.

Social support was added to Model 3. This model to tested hypothesis 3: graduate students who have stronger and more social support will experience flourishing. The results in this model confirmed hypothesis 3. Receiving emotional support is associated with a .511 (*p*<.001) increase (beta = .487) in flourishing. For every one unit increase in physical health there is a .204 (*p*<.001) increase (beta = .250) in flourishing. Physical health was significant, but became strongly significant after accounting for social support while graduate school-related stressors were strongly significant and reduced to moderately significant. For every one unit increase in the stressors faced in graduate school, flourishing decreased (beta = -.192) by .193 (*p*<.01). Being an out-of-state graduate student is marginally significant (.089) and when compared to being an in-

state graduate student, out-of-state graduate students are associated with a .154 increase (beta = -.109) in flourishing. Flourishing Model 3 explained 39.9% of the variance of flourishing.

To test Hypothesis 4, that social support buffers the relationship between stressors and flourishing mental health, I tested the interaction between graduate school stressors and emotional support received (not shown in Table 5; interaction with financial stress not tested because the direct effect was not significant). The interaction was not significant, suggesting that the association between graduate school-related stressors and flourishing mental health does not depend on emotional support received.

Stress, Social Support, and Positive Well-Being

The linear regression results for positive well-being are presented in Table 6. For every one unit increase in physical health there is a .377 ($p<.001$) increase (beta = .415) in positive well-being. Positive well-being Model 1 explained 16.1% of the variance of positive well-being.

Stressors were added to the analysis in Model 2. This model tested the first hypothesis, that graduate students who experience more stressors will have higher levels of anxiety and depression and therefore are less likely experiencing positive well-being. The results in this model were as hypothesized. For every one unit increase in the stressors faced in graduate school, positive well-being decreased (beta = -.344) by .384 ($p<.001$). Being an out-of-state graduate student is marginally significant (.078) and when compared to being an in-state graduate student, out-of-state graduate students are associated with a .192 increase (beta = .123) in positive well-being. Positive well-being Model 2 explained 28.9% of the variance of positive well-being.

Social support was added to Model 3 to test hypothesis 3. The results in this model confirmed the hypothesis. Receiving emotional support is associated with a .501 ($p<.001$) increase (beta = .412) in positive well-being. Graduate school-related stressors were strongly significant and reduced to moderately significant. For every one unit increase in the stressors faced in graduate school,

positive well-being decreased (beta = -.225) by .252 (p<.01). Being an out-of-state graduate

student is marginally significant (.091) and when compared to being an in-state graduate student,

out-of-state graduate students are associated with a .166 increase (beta =.106) in positive well-

being. Positive well-being Model 3 explained 43.1% of the variance of positive well-being.

To test Hypothesis 4, that social support buffers the relationship between stressors and positive

well-being, I tested the interaction between graduate school stressors and emotional support

received (not shown in Table 6; interaction with financial stress not tested because the direct

effect was not significant). The interaction was not significant, suggesting that the association

between graduate school-related stressors and positive well-being does not depend on emotional

support received.

CHAPTER V

CONCLUSION

Graduate students are an understudied population and current evidence suggests that stress and social support are important in understanding well-being for this distinctive social group. This study drew from a sample of graduate students from a large public university in order to contribute to our understanding of mental health among graduate students. There were three objectives of this study. The first was to determine whether the independent variable, social support, was negatively associated with anxiety and depression and positively associated with positive well-being and flourishing. The second objective was to examine the relationship between stressors and mental health. The third objective was to determine whether social support moderated the associations between stressors and mental health. The results of the study indicated that graduate students who receive higher levels of emotional support had lower levels of mental distress and higher levels of flourishing and positive well-being. The results also suggested that graduate school-related stressors and financial stress were associated with higher levels of anxiety and depressive symptoms among graduate students.

One major contribution of this research is the application of the stress process model (Pearlin et al. 1981) to the study of mental health among graduate students. Stress can impact students' productivity and well-being. In the stress process model, stressors lead to stress which can then turn into distress (i.e. manifestations of stress like anxiety, depression, and flourishing) and this study confirmed that graduate school stressors and financial stress are positively associated with

anxiety and depressive symptoms while decreasing flourishing. Another contribution of the current study is the examination of flourishing. With a great deal of research on the struggles brought on by mental health, analyzing the full continuum of mental health rather than just the negatives can inform strategies, services, and interventions for improving overall well-being.

The stress process model conceptualizes social support as be a moderator of stress which in turn can reduce mental health distress. While the stress buffering hypothesis was not supported in the current study, this does not negate the importance of potential relationships seeing as only one form of social support was measured. An important note is that this study only focused on the moderating relationship between stress, social support, and mental health, but the stress process can be applied to the mediation effect of the same variables. This serves as another avenue to expand on the limited research on graduate students and flourishing. Applying a sociological lens (examining graduate student's social environment) to a population that is suffering at a rate of being six times more likely to suffer from endure anxiety and depression (Levecque et al. 2017), ideally, leads to one avenue for positive change and supporting those who are struggling to flourish while in graduate school. The present data set could yield answers to future questions. Evidence has shown, "students struggling with mental illness are at greater risk of academic failure" (Fink 2014:380). This statement alone should be motivation for institutions to explore how to reduce the risk of anxiety and depression among graduate students and support their ability to flourish.

Among the graduate students in the current study, nearly 25% reported experiencing severe levels of anxiety with just over 45% experiencing mild to moderate levels of anxiety. The results for depression were similar, with 42% of graduate students experiencing moderate to severe levels of depression. These numbers are not inconsequential. Seeing that symptoms of anxiety and depression were lower among graduate students who reported receiving more emotional support begs the question of how can more social support be provided to the graduate student population?

Instead of treating the symptom, great benefit can be found in preventing the symptom in the first place. With this research showing that the reception of emotional support can increase positive well-being, then questions needs to be asked and answered about providing more emotional support to graduate students. Considering just under 50% experienced the stressor labeled Imposter Syndrome very often or often highlights a need for more candid conversations about not being alone and feeling integrated into graduate school. These kinds of conversations could better enable feelings of emotional support.

Limitations and Future Research

The contributions of this quantitative study were applying already existing scales (a large amount) to a novel social group in order to better understand the influence of stressors and social support on the mental health of graduate students. A limitation is the distribution of the survey to graduate students from a single university. Although different disciplines were included, these results may not be generalizable to graduate students from other universities. An additional limitation of this study was the low response rate. A contributing factor to the low response rate was the timing. On March 11, 2020, COVID-19 was declared a global pandemic by the World Health Organization. The university from which the current study sample was selected moved to remote teaching shortly thereafter, which overlapped with the distribution of the survey. It is also very likely that the stress brought on by COVID-19 likely influenced participant's responses and their current mental health status. Considering there was great uncertainty revolving around the shutdown of the university, an increasing number of emails sent to students, and the rapid transition to online learning, which impacts graduate students both as instructors and as students response rates were likely greatly impacted due to COVID-19. Questions were asked about COVID-19 in the survey, and they will be examined in future research.

Another issue was trying to avoid respondent fatigue and assuring enough scales and measures were included in the survey to adequately answer the hypotheses proposed. Due to the

multiplicative aspect of stressors, it is important to include as many stressors as possible that could exist in a graduate student's life (Pearlin and Jacobson 1989). Despite the importance of addressing diverse stressors, a major limitation of this research proposal is being able to encompass all stressors that are present for all graduate students. One cannot negate the stressors in one's home life, familial bonds, and health issues (to name a few). For example, this survey only addressed a small portion of the racism and sexism present in graduate school. It is important to note that stressors outside graduate school likely play an influential role in the mental health of graduate students; research still needs to be conducted on this topic. A future study could be conducted regarding the cultural and social capital of graduate students and the impact such capital can have on the mental health of graduate students. The results regarding being an out-of-state student and experiencing more flourishing than in-state students challenged a dominate understanding of facing the numerous stressors that come with paying out-of-state tuition and being further away from home. Future research could examine what types of social support this group of people have access to that in-state students may not.

Both a limitation and potential contribution of this study was the scale used to test graduate school-related stressors. It was developed for this study and still needs to be further validated in other samples and it reliability needs further testing. Considering this study included open-ended questions concerning types of stress felt, those responses could help improved the graduate stressor scale. The future directions of this data set are plentiful. Only one aspect of social support was evaluated for this study, but more can be explored from this data set alone. Discerning how many of the participants have sought mental health care can also be studied in future analyses. The open-ended questions inquired about coping strategies could also yield helpful information for supporting graduate students.

Despite these limitations, there are few studies examining the mental health of graduate students, and this study is an important starting point that can lay the foundation for future research. More

intensive mitigation and outreach efforts are needed to facilitate a healthier learning and working

environment for graduate students. Studies have shown that graduate students have low

utilization rates when it comes to mental health care (Garcia-Williams et al. 2014), so efforts to

encourage social integration, reducing the stigma of mental distress, and facilitating more support

from faculty could help increase help-seeking behavior. Considering physical health was

positively associated with flourishing and positive well-being, incorporating physical well-being

activities into graduate school could help reduce anxiety and depression symptoms. This warrants

further exploration which will start by examining the open-ended questions on the survey that

inquired about how to improve mental health services on campus and in one's department. The

open-ended questions also asked how the university and/or department could improve when

thinking about social support and stress among graduate students. Ideally, these responses can

yield ideas for proactive measures at OSU.

Down the road, community-based participatory research would be ideal for implementing real

change in the graduate sphere. Working with graduate students to discuss research-policy

channels and how to facilitate those will be necessary. Workshops and/or meetings to discuss

various factors of mental health and how to improve flourishing while in grad school mixed with

how to get departments on board to either reduce the number of stressors of find means to

mediate, potentially through social support program design, the impact stressors have on mental

health. Starting with OSU graduate students, we can work together to create policy

recommendations and pilot-programs in support of the policy changes. Community-based

participatory research provides real opportunities for graduate students to share the cultural

experience that is graduate school and what they may face on a day to day basis. With graduate

students being major sources of scientific advancement in higher education and being on the front

lines teaching introductory classes during a pandemic, the stressors faced in grad school and their

potentially negative influence on students' well-being should be deemed as a social issue in

desperate need of attention, examination, and change. It is the voices of the population in need who should be present in informing policy changes in graduate school. So, where does one start? By asking the graduate students what they need. They are the experts on graduate school—they are the experts on the stressors of graduate school—they have a voice and it is time to listen.

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APPENDICES

Appendix A. General Anxiety Disorder 7-item (GAD-7) Scale (Spitzer et al. 2006)

Over the past 2 weeks, how often have you been bothered by the following problems?
Feeling nervous, anxious, or on edge.
Feeling afraid as if something awful might happen.
Worrying too much about different things.
Trouble relaxing.
Being so restless that it's hard to sit still.
Becoming easily annoyed or irritable.
Not being able to stop or control worrying.

Note: Response options were coded 1=Not at all; 2=Several days; 3=More than half the days; 4=Nearly every day

Appendix B. Patient Health Questionnaire (PHQ-9) (Kroenke and Spitzer 2002)

Over the past 2 weeks, how often have you been bothered by the following problems?

Little interest or pleasure in doing things.

Feeling down, depressed, or hopeless.

Feeling bad about yourself or that you are a failure or have let yourself down.

Feeling tired or having little energy.

Poor appetite or overeating.

Trouble falling or staying asleep, or sleeping too much.

Trouble concentrating on things, such as reading or watching television.

Moving or speaking so slowly that other people have noticed. Or the opposite-being so fidgety or restless that you have been moving around a lot more than usual.

Thoughts that you would be better off dead, or of hurting yourself in some way.

Note: Response options were coded 1=Not at all; 2=Several days; 3=More than half the days; 4=Nearly every day

Appendix C. Mental Health Continuum-Short Form (MCH-SF) adapted from Keyes et al. (2008) and Lamers et al. (2011)

During the past month, how often did you feel…

Happy?

Interested in life?

Satisfied with life?

That you had something important to contribute to society?

That you belonged to a community, such as a social group or your neighborhood?

That our society is a good place, or is becoming a better place, for all people?

That people are basically good?

That the way our society works makes sense to you?

That you liked most parts of your personality?

Good at managing the responsibilities of your daily life?

That you had warm and trusting relationships with others?

That you had experiences that challenged you to grow and become a better person?

Confident to think or express your own ideas and opinions?

That your life has a sense of direction or meaning to it?

Note: Response options were coded 1=Never; 2=Once or twice; 3=About once a week; 4=Almost every day; 5=Every day

Appendix D. Flourishing Scale (Diener et al. 2010)

Please share how much you agree or disagree with each of the following statements

I lead a purposeful and meaningful life.

My social relationships are supportive and rewarding.

I am engaged and interested in my daily activities.

I actively contribute to the happiness and well-being of others.

I am competent and capable in the activities that are important to me.

I am a good person and live a good life.

I am optimistic about my future.

People respect me.

Note: Response options were coded 1=Strongly disagree; 2=Disagree; 3=Neither agree nor disagree; 4=Agree; 5=Strongly agree

Appendix E. Financial Stress Scale (Bray 2001)

Over the past 6 months, have any of the following happened to your household because of a shortage of money?

We pawned or sold something.

We could not pay electricity, gas, water, or telephone bills on time.

We were unable to heat or cool our home.

We sought financial assistance from friends or family.

Note: Response options were coded 0=No; 1=Yes

Appendix F. Graduate School Stressors (Almy 2020)

The next questions are about potential stressors experienced in graduate school. During the past 6 months, how often have you…

Struggled with the pace of change?

Struggled with differing teaching styles?

Struggled managing your relationships with faculty?

Struggled managing your relationships with fellow graduate students in your program?

Felt an increase in your workload?

Felt insecure about unwritten rules and expectations?

Felt the pressure of frequent evaluation?

Felt that your department is too competitive?

Felt that your department is not inclusive?

Felt overwhelmed by the transition to your OSU graduate program?

Felt overwhelmed by your GTA/GRA responsibilities?

Felt overwhelmed by your responsibilities as a graduate student?

Felt like there was a power dynamic between you and your professors?

Felt pressure to publish papers?

Felt concern with sharing authorship?

Felt like you lost part of your social support network when you came to graduate school?

Had feelings of job insecurity?

Had feelings of financial insecurity?

Feared a lack of funding opportunities?

Experienced Impostor Syndrome?

Experienced stress due to class content?

Note: Response options were coded 1=Very often; 2=Fairly often; 3=Sometimes; 4=Almost never; 5=Never

Appendix G. 2-Way Social Support Scale (Shakespeare-Finch and Obst 2011)

Please share the degree to which each of the following statements is true for you.

There is at least one person that I can share most things with.

There is someone in my life I can get emotional support from.

When I am feeling down, there is someone I can lean on.

When someone I was close to was sick, I helped them.

I look for ways to cheer people up when they are feeling down.

I give others a sense of comfort in times of need.

People confide in me when they have problems.

If I am stranded somewhere, there is someone who would get me.

I have someone to help me if I am physically unwell.

There is someone who would give me financial assistance.

There is someone who can help me fulfill my responsibilities when I am unable.

I have helped someone with their responsibilities when they were unable to fulfill them.

I feel that I have a circle of people who value me.

I am a person others turn to for help with tasks.

I give financial assistance to people in my life.

Note: Response options were coded 1=Always true; 2=Often true; 3=Sometimes true; 4=Not at all true

Table 1. Descriptive statistics of study variables	Mean/%	SD	Min	Max	alpha
Mental Health Outcomes					
Anxiety Symptoms/GAD7	16.153	6.465	7	28	0.926
Depressive Symptoms/PHQ9	18.897	7.022	9	36	0.901
Flourishing Mental Health	3.934	0.714	1	5	0.907
Positive Well-Being	3.429	0.812	1	5	0.928
Stressors					
Graduate School-Related Stressors	2.753	0.751	1	4	0.905
Financial Stress	0.098	0.204	1	2	0.675
Social Support					
Receiving Emotional Support	3.428	0.683	1	4	0.890
Control Variables					
Age	30.011	7.961	22	65	
Gender (Woman=1)	0.718		0	1	
Residency Status (Out of state=1)	0.538		0	1	
Relationship Status (Married/Cohabiting=1)	0.446		0	1	
Relationship Status (Dating=1)	0.205		0	1	
Relationship Status (Single=1)	0.344		0	1	
Physical Health	3.456	0.884	1	5	

Table 2. Bivariate correlations among study variables

	Generalized anxiety symptoms	Depressive symptoms	Flourishing mental health	Positive well-being
Mental Health Outcomes				
Generalized Anxiety Symptoms				
Depressive Symptoms	0.772***			
Flourishing Mental Health	-0.483***	-0.557***		
Positive Well-Being	-0.564***	-0.614***	0.761***	
Control Variables				
Age	-0.169*	-0.157*	0.152*	0.099
Gender (Woman=1)	0.123	0.058	0.036	0.025
Residency Status (Out of state=1)	-0.138	-0.169*	0.091	0.112
Relationship Status (Married/Cohabiting=1)	0.029	-0.107	0.069	0.028
Relationship Status (Dating=1)	0.002	-0.080	0.070	0.065
Relationship Status (Single=1)	-0.053	0.152*	-0.116	-0.061
Physical Health	-0.318***	-0.415***	0.347***	0.387***
Graduate School-Related Stressors	0.533***	0.543***	-0.412***	-0.446***
Financial Stress	0.308***	0.374***	-0.095	-0.252***
Receiving Emotional Support	-0.301***	-0.408***	0.532***	0.551***

Note: *p<.05, **p<.01, ***p<.001

Table 3. Linear regression of generalized anxiety symptoms

	Model 1			Model 2			Model 3		
	B	t	beta	B	t	beta	B	t	beta
Constant	14.846	10.58		16.059	12.17		15.313	11.32	
	(1.403)			(1.320)			(1.352)		
Age	-0.091	-1.26	-0.103	-0.062	-0.95	-0.071	-0.075	-1.14	-0.086
	(0.072)			(0.066)			(0.065)		
Gender (Woman=1)	1.556	1.37	0.106	0.109	0.10	0.007	0.577	0.54	0.039
	(1.137)			(1.060)			(1.076)		
Residency Status (Out of state=1)	-0.834	-0.86	-0.065	-1.846*	-2.03	-0.144	-1.758	-1.95	-0.137
	(0.971)			(0.910)			(0.903)		
Relationship Status (Married/Cohabiting=1)	1.132	0.95	0.088	1.141	1.04	0.088	1.702	1.51	0.131
	(1.191)			(1.100)			(1.131)		
Relationship Status (Dating=1)	0.779	0.60	0.051	1.870	1.56	0.123	2.551*	2.07	0.168
	(1.299)			(1.201)			(1.232)		
Physical Health	-2.421***	-4.34	-0.328	-1.207*	-2.23	-0.163	-1.202*	-2.23	-1.63
	(0.561)			(0.541)			(0.538)		
Graduate School-Related Stressors				4.053***	5.91	0.442	3.658***	5.08	0.398
				(0.686)			(0.721)		
Financial Stress				4.457	1.79	0.13	3.644	1.40	0.102
				(2.485)			(2.600)		
Receiving Emotional Support							-1.525*	2.08	-0.160
							(0.732)		
Adjusted R²	0.100			0.289			0.306		

Note: *p<.05, **p<.01, ***p<.001; Reference category for relationship status is single. Standard errors in parentheses.

Table 4. Linear regression of depressive symptoms

	Model 1			Model 2			Model 3		
	B	t	Beta	B	t	Beta	B	t	Beta
Constant	20.464	14.61		20.878	16.77		19.900	15.76	
	(1.400)			(1.245)			(1.262)		
Age	-0.057	-0.78	-0.059	-0.012	-0.19	-0.013	-0.028	-0.45	-0.030
	(0.073)			(0.063)			(0.062)		
Gender (Woman=1)	0.982	0.86	0.061	-0.143	-0.14	-0.009	0.557	0.55	0.036
	(1.144)			(1.011)			(1.016)		
Residency Status (Out of state=1)	-1.971*	-2.02	-0.141	-2.453**	-2.84	-0.181	-2.405**	-2.84	-0.176
	(0.978)			(0.864)			(0.847)		
Relationship Status (Married/Cohabiting=1)	-2.267	-1.89	-0.16	-1.989	-1.90	-0.145	-1.140	-1.07	-0.083
	(1.198)			(1.048)			(1.065)		
Relationship Status (Dating=1)	-1.93	-1.47	-0.115	-0.529	-0.46	-0.033	0.359	0.31	0.022
	(1.317)			(1.154)			(1.168)		
Physical Health	-3.309***	-5.80	-0.406	-1.987***	-3.79	-0.252	-1.929***	-3.74	-0.244
	(0.570)			(0.525)			(0.516)		
Graduate School-Related Stressors				4.289***	6.53	0.441	3.656***	5.37	0.374
				(0.657)			(0.681)		
Financial Stress				5.293*	2.20	0.144	5.186*	2.08	0.135
				(2.410)			(2.488)		
Receiving Emotional Support							-2.077**	-2.97	-0.206
							(0.701)		
Adjusted R²	0.214			0.402			0.432		

Note: *p<.05, **p<.01, ***p<.001; Reference category for relationship status is single. Standard errors in parentheses.

Table 5. Linear regression of flourishing mental health

	Model 1			Model 2			Model 3		
	B	t	Beta	B	t	Beta	B	t	Beta
Constant	3.736	25.46		3.719	25.03		3.968	29.52	
	(0.147)			(0.149)			(0.134)		
Age	0.008	1.00	0.079	0.002	0.30	0.024	0.008	1.16	0.080
	(0.008)			(0.007)			(0.007)		
Gender (Woman=1)	0.070	0.58	0.043	0.090	0.75	0.056	-0.081	-0.76	-0.051
	(0.120)			(0.120)			(0.108)		
Residency Status (Out of state=1)	0.117	1.14	0.083	0.168	1.64	0.119	0.154	1.71	0.109
	(0.102)			(0.102)			(0.090)		
Relationship Status (Married/Cohabiting=1)	0.197	1.57	0.137	0.171	1.37	0.121	-0.023	-0.21	-0.016
	(0.125)			(0.125)			(0.113)		
Relationship Status (Dating=1)	0.120	0.87	0.071	0.070	0.51	0.042	-0.153	-1.23	0.090
	(0.138)			(0.138)			(0.124)		
Physical Health	0.284***	4.79	0.349	0.215**	3.46	0.264	0.204***	3.74	0.250
	(0.059)			(0.062)			(0.055)		
Graduate School-Related Stressors				-0.330***	-4.24	-0.329	-0.193**	-2.69	-0.192
				(0.078)			(0.072)		
Financial Stress				0.257	0.89	0.067	0.390	1.47	0.098
				(0.287)			(0.264)		
Receiving Emotional Support							0.511***	6.95	0.487
							(0.074)		
Adjusted R^2	0.140			0.206			0.399		

Note: *p<.05, **p<.01, ***p<.001; Reference category for relationship status is single. Standard errors in parentheses.

Table 6. Linear regression of positive well-being (Mental Health Continuum-Short Form)

	Model 1			Model 2			Model 3		
	B	*t*	*Beta*	*B*	*t*	*Beta*	*B*	*t*	*Beta*
Constant	3.403	20.080		3.295	20.780		3.492	23.940	
	(0.170)			(0.159)			(0.146)		
Age	0.005	0.630	0.049	0.001	0.150	0.011	0.006	0.790	0.053
	(0.009)			(0.008)			(0.007)		
Gender (Woman=1)	-0.033	-0.240	-0.018	0.065	0.500	0.036	-0.064	-0.540	-0.036
	(0.137)			(0.128)			(0.117)		
Residency Status (Out of state=1)	0.137	1.190	0.087	0.192	1.770	0.123	0.166	1.700	0.106
	(0.115)			(0.108)			(0.098)		
Relationship Status (Married/Cohabiting=1)	0.055	0.390	0.035	0.118	0.890	0.075	-0.051	-0.420	-0.033
	(0.141)			(0.132)			(0.122)		
Relationship Status (Dating=1)	-0.001	-0.010	-0.001	-0.028	-0.190	-0.015	-0.223	-1.650	-0.119
	(0.156)			(0.146)			(0.135)		
Physical Health	0.377***	5.710	0.415	0.309***	4.700	0.343	0.288***	4.860	0.320
	(0.066)			(0.066)			(0.059)		
Graduate School-Related Stressors				-0.384***	-4.650	-0.344	-0.252**	-3.220	-0.225
				(0.082)			(0.078)		
Financial Stress				-0.051	-0.170	-0.012	0.057	0.200	0.013
				(0.303)			(0.287)		
Receiving Emotional Support							0.501***	6.040	0.412
							(0.083)		
Adjusted r-squared	0.161			0.289			0.431		

Note: *p<.05, **p<.01, ***p<.001; Reference category for relationship status is single. Standard errors in parentheses.

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