

DISSERTATION

EVALUATING GRADUATE STUDENT EXPERIENCES RELATED TO SUCCESS AND
RESILIENCY: THE INFLUENCE OF MENTOR RELATIONSHIP, STRESS, AND
MOTIVATION

Submitted by

Ellen M. Ratajack

Department of Psychology

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Spring 2020

Doctoral Committee:

Advisor: Daniel J. Graham

Lorann Stallones

Tori Crain

Gregory Florant

Copyright by Ellen Marie Ratajack 2020

All Rights Reserved

ABSTRACT

EVALUATING GRADUATE STUDENT EXPERIENCES RELATED TO SUCCESS AND RESILIENCY: THE INFLUENCE OF MENTOR RELATIONSHIP, STRESS, AND MOTIVATION

Obtaining a graduate degree is a commendable task due to the amount of time and effort required from the individual student. A great deal of past research has examined the undergraduate experience, but few studies focus specifically on the graduate student experience which is drastically different. The following studies both examined the graduate experience with specific focus on the following topics: the importance of resilience and utilizing coping tactics to reduce the impact of stress, discrepancies between actual and ideal mentors, discrepancies between personal goals and program requirements, and finally exploring how graduate students become and stay motivated while earning their degrees.

TABLE OF CONTENTS

ABSTRACT.....	ii
Chapter I: General Introduction	1
Significance of the Problem.....	1
Very Relevant Literature.....	2
Research Questions and Hypotheses.....	3
Chapter II: The “Common” Graduate Student Experience	5
Relevant Theoretical Frameworks	6
Relevant Empirical Literature.....	13
The Present Study.	25
Method.....	27
Results.....	34
Discussion.....	47
Chapter III: “Take A Swim In Lake ‘You’”; Reflections On Motivation and Graduate School.....	55
Relevant Theoretical Framework.....	55
The Present Study.....	59
Reflexivity Statement.....	59
Method.....	60
Results.....	65
Discussion.....	69
References.....	73
Appendices.....	89-100
Appendix A: Personal Strivings Coding.....	89
Appendix B: Ideal Mentor Scale (IMS).....	91
Appendix C: Actual Mentor Scale (AMS).....	92
Appendix D: Weekly Stress Inventory (WSI-SR).....	93
Appendix E: Brief COPE.....	94
Appendix F: 14-Item Resilience Scale (RS-14).....	95
Appendix G: Interview Questions.....	96
Appendix H: Coding Manual Provided to Research Assistants.....	97

CHAPTER I: GENERAL INTRODUCTION

Graduate programs have a reputation for being rigorous and individualistic (Anderson & Louis, 1994; Austin, 2002). They often accept only the most elite students or professionals in the given field, with the assumption that they will succeed despite any challenges. Unfortunately graduate programs foster environments that are often isolating, abuse of power is rampant, workaholism is rewarded, and healthy coping mechanisms are scarce (Alt & Itzkovich, 2015; Itzkovich & Dolev, 2017; Mitroff, 1974).

Significance of the problem

Despite the initial recognition and honor of being admitted to graduate school there are often high attrition rates (range: 30-70%, average: 50%) in graduate programs (Bain, Fedynich, & Knight, 2011). Attrition typically occurs within the first four years of graduate programs and is more likely when the student is a woman, studying the humanities, of a minority background, or in smaller cohorts (CGS, 2004; CGS, 2006). Furthermore, admittance into a program does not guarantee success or a job in that discipline upon graduation (Golde, 2005; Raisman, 2013). When students spend years in programs that lack clear support or structure, they may feel discouraged and thus spend years in a program that they do not intend to complete or they may quit the program all together (Sondergaard, 2001). Lowered productivity increases overall costs for graduate programs. Students who are initially accepted into a program and provided with funding ought to complete programs in a timely fashion while being trained for positions both inside and outside of academia. However, there are loose definitions of “success” at the graduate level; general measures of objective success are non-existent and subjective perceptions of success can vary greatly by program.

Very Relevant Literature

The current study aims to contribute to an existing body of literature that examines motivation, resilience, stress, and success with special focus on graduate student experiences. Previous studies have identified the following factors as consistent predictors of graduate student success: departmental characteristics, student characteristics, mentor/mentee relationship, financial support, personal motivation, gender identity, and personality (Anderson & Louis, 1994; Bain et al, 2011; Girves & Wemmerus, 1988; Sondergaard, 2001).

The mentor/mentee relationship is consistently identified as one of the most important predictors of graduate success. Graduate students who feel supported by their mentors and their departments are more likely to complete their respective programs (Bain et al, 2011; Chan, Tong, & Henderson, 2017b; Kyvik & Smeby, 1994; Itzkovich & Alt, 2016). Inherent power dynamics exist between graduate students and mentors and the way power is exercised may influence how graduate students perceive the quality of the relationship with their mentor (Bundy-Fazioli, Quijano, & Bubar, 2011; Chan et al, 2017b). Department and program climate consistently predict graduate success as well; programs with clear structure, identifiable goals, and cooperation between faculty and graduate students are more predictive of graduate student success than programs without identifiable goals and where competition is normalized (Austin, 2002; Gardner & Barnes, 2007; Sondergaard, 2001). Motivation, especially intrinsic motivation (Rakes & Dunn, 2010) and resiliency have been identified as important predictors of enduring long-term, high-demand and thus stressful, experiences (Bonanno, 2004; Deci & Ryan, 2008; Ledesma, 2014; Ryan & Deci, 2000).

While there has been consistency among predictors of success, definitions of graduate success have more variability. Graduate success has been measured in the following ways:

degree completion, degree progress, number of research publications, number of courses taught, and grade point average (Austin, 2002; Bain et al, 2011; Berg & Ferber, 1983; Girves & Wemmerus, 1988). However, different graduate programs may emphasize each of these outcomes differently (e.g. natural science programs may highlight research publications and clinical programs may highlight the importance of internships). Therefore, the current study will attempt to identify which markers of success graduate students perceive as most important according to their respective programs and which markers of success graduate students identify as personally relevant. This study will also investigate how success operates as a function of external (e.g. mentor relationship) and personal (e.g. motivation, resilience, coping strategies, stress) factors.

Research Questions and Hypotheses

Research Question 1: Are graduate students perceiving stress as impactful and how are the mentor relationship and coping skills relevant?

Hypothesis 1. As the value of resiliency increases, the relationship between discrepant actual and ideal mentor qualities (guidance, integrity, relationship) and weekly stress decreases.

Hypothesis 2. As the total number of weekly coping tactics increases, the relationship between discrepant actual and ideal mentor qualities (guidance, integrity, relationship) and weekly stress decreases.

Research Question 2: What are common requirements in graduate programs? What are common personal strivings for graduate students and how much overlap exists between those strivings and program requirements?

Hypothesis 3: Graduate students who are the same biological sex as their mentors will report that the impact of weekly stress on mentee well-being is less than graduate students who are not the same biological sex as their mentors.

Hypothesis 4. Graduate students will report alignment between program requirements and personal goals.

Research Question 3: What are common experiences for graduate students? Does graduate student motivation demonstrate components of Self Determination Theory?

CHAPTER II: THE “COMMON” GRADUATE STUDENT EXPERIENCE

Graduate school is a multi-faceted endeavor and various factors (e.g. stress, resilience, mentor relationship) can influence success, both at the personal and required program level. Individual graduate programs can be grueling and student success is closely linked to program climate and the relationship between the graduate student and mentor. Traditionally, GRE scores, GPA, applied experience, and prior education are investigated during the graduate school admissions process. Students with impressive track records (e.g. publications, high GRE scores, high GPA) are more likely to be admitted into graduate programs than students who have less impressive accolades. However, attrition rates cannot be denied; they are alarmingly high in graduate programs with approximately 1 out of every 2 students admitted to graduate programs leaving before degree completion (Bain et al., 2011). Attrition is an expense at multiple levels (i.e. in terms of money, time and psychological and emotional energy) for students and the university.

A considerable amount of research has been conducted on undergraduate student success, but graduate students are a relatively understudied population. This is unfortunate and problematic because graduate students are unique; they are not yet recognized as professionals in their respective fields, but they are held to higher standards than undergraduate students because graduate students are more advanced scholars. This disconnect creates unique challenges and stressors (Goplerud, 2001). For instance, graduate students do not receive the same level of support as faculty members despite being expected to complete similar tasks while simultaneously completing coursework (e.g. a graduate student may be responsible for teaching a course, developing content, and all grading in addition to completing class assignments and

research projects for less money and with less or no support from teaching assistants). Hyun et al (2006) sought to explore differences between graduate and undergraduate students who seek out mental health support. The findings presented by Hyun et al (2006) suggest that there is in fact a difference between the two cohorts. However, this discussion is limited to mentioning that graduate school is less structured than undergraduate education and therefore a greater sense of autonomy is paramount for graduate students. The current study will attempt to address issues and experiences common to graduate students by directly asking graduate students about their experiences. It is important to examine the various qualities of graduate programs and to determine if and when consistencies and inconsistencies exist within and across programs.

Relevant Theoretical Frameworks

Social Influence Theory

In 1951, Asch and Guetzkow published findings for the famous “Line Length Judgment Study” to examine the influence of social pressure and conformity on an individual’s behavior. In general, Social Influence Theory posits that a specific social context (in the case of the present study, graduate programs) can cause attitudes to both form and change in response to those specific social interactions (e.g. interactions with advisors). Therefore, social interactions between numerous people must occur for social influence to be a factor in individual behavior (Prislin & Wood, 2005). Individuals rely on cues from other group members’ behaviors when the situation is novel or ambiguous to increase the likelihood that they will accomplish both social (e.g., acceptance as an academic colleague) and informational (e.g., spending more time on important tasks that will advance their career, like publishing research) goals. Graduate students want to be accepted by members of the program (both peers and faculty) so they may be inclined

to adopt common attitudes and behaviors that they observe via socialization in the program (Anderson & Louis, 1994; Austin, 2002; Gardner & Barnes, 2007).

Two specific forms of social influence have been identified: normative and informational influence (Deutsch & Gerard, 1955). Normative influence occurs when individuals want to be liked by the larger group and informational influence occurs when individuals want to be perceived as accurate and having correct information to inform decisions. Both forms of influence can encourage individuals to behave in ways that conform to larger group norms and these responses tend to be influenced by three basic motives. The first two motives relate to normative influence and the third motive addresses informational influence (Prislin & Wood, 2005). People want to:

- 1) be seen favorably by others
- 2) achieve acceptance and avoid ostracism
- 3) be knowledgeable and be seen as knowledgeable

These three motives are related to social consensus and group polarization, which may be common occurrences in academia, particularly for graduate students. Social consensus occurs when the majority of group members agree upon certain judgments, feelings and actions. This was demonstrated during the aforementioned “Line Length Judgment Study” because individual participants often aligned with group attitudes and judgments even when group responses were clearly wrong (Asch and Guetzkow, 1951). Social consensus is especially powerful and likely to occur when individuals are concerned about belonging to a group or matching the group’s accepted attitudes to avoid ostracism (Prislin & Wood, 2005). For example, graduate students may agree publicly that producing research is the most important marker of success, but individually some students may believe that teaching is the most important marker of success.

Social consensus in groups is not necessarily problematic, but can become a problem when it is taken to an extreme level, as in the case of group polarization, which occurs when individual attitudes become more extreme and potentially risky to increase a sense of group membership (Myers & Lamm, 1978). Lamm and Myers (1976) identify four qualities of group polarization:

- 1) Dominant attitudes become strengthened and diversity in attitudes is reduced.
- 2) The exaggerated attitude is a departure from normally held attitudes across multiple groups.
- 3) Predictions about shifts in attitudes are usually precise because they are informed by prior behaviors or attitudes and norms.
- 4) Group polarization can occur even if individual members of the group do not report more extreme attitudes or tendencies.

Group polarization can occur in numerous ways throughout graduate programs, but one way may be especially salient during group discussions. Seminars are typical in graduate programs and open dialogue is encouraged, but students are able to determine if the instructor or majority of their classmates endorse certain attitudes. In order to appear particularly knowledgeable, students may endorse more extreme attitudes when in a group setting because it could increase their status as a group member (Myers & Lamm, 1975). This polarization may also prevent students with dissenting attitudes from contributing to the conversation for fear of ostracism and judgment. These students may also feel less empowered because they cannot or do not want to contribute to the conversation (Cook-Sather, 2002). The terms “power” and “empowerment” alone can arouse strong emotions, especially for those who have been in situations where they have reduced or minimal power. Regardless of program type, power tends

to have negative connotations to students because to have power means to have control over another person (Chan et al., 2017b; Cook-Sather, 2002). Unfortunately, power is often abused, especially when there is minimal threat of retaliation (Bundy-Fazioli et al., 2013; Chan et al., 2017; Gibson et al., 2014; Hoffman, 1986).

Conflict is likely to occur when mentor and mentee expectations differ and that can exacerbate the challenges of graduate school. However, graduate students may be more likely to avoid conflict, have positive experiences, and successfully complete their programs if they feel supported by their mentors and connected to their programs of study.

Social Interdependence Theory

Social interdependence theory has been utilized to examine behavior in a variety of settings, but most notably in business and educational settings (Johnson & Johnson, 2005). Previous research often utilized social interdependence theory to examine: effort to achieve at the individual level, positive interpersonal relationships, self-esteem, and psychological health (Holmes, 2002; Johnson & Johnson, 2002; Johnson & Johnson, 2009). In short, social interdependence theory addresses how personal outcomes are affected by one's own and others' behaviors (Johnson & Johnson, 2009). Interdependence can be positive (occurs when individual contributions enhance group goals) or negative (occurs when individual actions prevent each other's goal achievement; one person can succeed only if another person fails). If no interaction exists between individuals or groups, then there can be no interdependence. A core facet of the theory is that people must interact with each other. It is necessary to examine how individual goals are structured and how that determines which group members interact with each other. This in turn affects the final outcome because there must be some shared goal among those involved.

Cooperation and competition are further explored in this theory and general findings suggest that cooperation is superior to competition when trying to accomplish mutual goals, like writing a manuscript with fellow graduate students and faculty (Elliot et al., 2016). Essential components of cooperation include positive interdependence, individual accountability, personal responsibility, appropriate use of social skills, and finally, group processing. Educational programs tend to be particularly interested in the application of cooperative learning, which occurs when students work in small groups to encourage and facilitate both group and individual learning. This could be particularly applicable in the current study because graduate students often need to collaborate on projects and seldom work in complete isolation. Even if work is not being completed in the same time or setting, networking is a crucial skill.

Competition may be more prevalent when individual group members are more concerned with protecting their own self-worth or self-image (compared to promoting the larger group), individuals engage in self-handicapping, and defensive pessimism is prevalent (Johnson & Johnson, 2009). There are certain situations where individual efforts are preferred and required (e.g. completing a dissertation manuscript) and when competition can be constructive. Competition is preferable when winning or recognition is not important (e.g. team study review session where no points are rewarded for attendance, but competition is encouraged), when each person's chances of winning or receiving recognition are relatively equal (i.e. recognition is based on chance more than achievement (e.g. winning a raffle), there are clear rules for participation and clear criteria for winning or receiving recognition (e.g. must be present at a study session to receive bonus points and work in groups). Graduate students are expected to produce work both independently and with others. Therefore, individual group members can influence the larger group dynamic, based on how those individuals approach their personal

goals, which may be explicit (e.g. pass comprehensive exams) or general (e.g. be a good person who does service work) in nature.

Personal Strivings Approach

Personal strivings represent general goals that people consistently work towards (e.g. to do well in classes) (Emmons, 1991). Strivings are different from goals in that goals represent what a person does (actual behavior related directly to goal) and strivings provide insight as to what a person is like (what values are most important) (Emmons, 1992). Different events or actions carry different value or weight depending on how well those actions aid an individual in task completion. Events with more personal relevance receive higher levels of commitment because they take priority over events that do not have personal relevance; people are more likely to spend time working towards goals that are important. Emmons (1991) identified four categories for strivings: achievement, affiliation, intimacy, and power and the last three have been the most influential on overall well-being. In other words, personal achievement is important, but does not outweigh the importance of interpersonal connectedness and power. When individuals are highly motivated to achieve, they often do so at the expense of close relationships (e.g. graduate students are highly motivated to demonstrate academic achievement, but pursuing such achievement is time-consuming).

These strivings influence how individuals seek out personally relevant events, which in turn influences general well-being. For example, someone who has a personal striving to “succeed academically” is likely to seek out events that will contribute to that goal (e.g. study sessions, networking events, writing retreats, etc.). Individuals who attend these types of events, particularly ones where they produce work (writing retreats), may experience a sense of accomplishment and continue to pursue their larger goals.

Emmons (1992) discussed the importance of level, or the degree of specificity or generality of goals, and potential outcomes that exist based on high- or low-level goals. High-level strivers have broad goals that encompass multiple domains; these goals are often challenging and abstract, but more meaningful to the individual (e.g., contribute novel findings that advance one's field). Low-level strivers have goals that are concrete, specific, but superficial (e.g., finish grading papers by a require deadline). Unfortunately, low-level goals are more likely to be completed and a common theme of meaning vs. manageability emerges. Even though low-level goals are not as fulfilling, people are likely to work towards them because they are feasible and not as mentally or psychologically taxing. Personality and type of level are related; people who are high-level strivers are more likely to report feelings of depression, neuroticism, and self-consciousness, and low-level strivers are less conscientious (Emmons, 1992). Personal strivings are relevant to the current topic because graduate students are likely to have both high- and low-level goals. Utilizing a personal strivings approach could provide new insight regarding graduate students' goals, motivation, and sense of achievement.

Predicting success

There is a great deal of uncertainty regarding clear measures and predictors of success and consistent graduate student progress. What does typical progress look like for most students? This is a question that has yet to receive a clear response. Despite this uncertainty, several predictors have been utilized in the past such as advisor relationship, grades, program involvement, sufficient funding, satisfaction with the department, and feelings of alienation (Austin, 2002; Bain, Fedynich, & Knight, 2011; Girves & Wemmerus, 1988). Success is often measured by degree progress, but different programs emphasize different goals and academic markers (e.g. research publications, courses taught, clients supervised, etc.). Therefore, the

current study will also address graduate student perceptions of success; which goals do graduate students identify as personally relevant? And which do students perceive to be most important according to their program?

Relevant Empirical Literature

Stress and coping

Graduate students experience stress on a regular basis and have stressors that are unique to being in a graduate program. Stress has been defined as an individual's physiological and psychological response to a stressor: an environmental, social, or internal demand that requires the individual to readjust her usual behavior patterns in order to restore balance, or maintain equilibrium (Antonovsky, 1987; Lazarus, 1966; Lazarus & Cohen, 1977; Selye, 1956). Studies and understandings of stress have evolved over the past 100 years to include how acute stressors can have long-term effects on those who experience them.

Stress was originally discussed in terms of "fight or flight" (or freeze) and Cannon (1932) proposed that these common responses were directly applicable to acute stressors, or events that need immediate attention. Regardless of stressor type or severity, Cannon (1932) identified that the sympathetic nervous system responds similarly, a belief still supported today (Helpman, Penso, Zagoory-Sharon, Feldman, & Gilboa-Schechtman, 2017; McEwen, 2007; Sapolsky, 2004). Selye (1956) extended Cannon's work to also describe how people respond to long-term stress according to the General Adaptation Syndrome (GAS); a three-stage model which identifies how people initially identify a stressor (alarm), address the acute stressor (resistance), and recover from encountering the stressor (exhaustion). The final stage can also refer to actual feelings of exhaustion, or complete depletion of resources, and not just recovering from the stressful experience. The stress response is a necessary survival adaptation, but even though humans have

learned to appraise stressors differently, the sympathetic nervous system has yet to evolve in a way that matches the appraisal (e.g. sympathetic nervous and endocrine systems will have the same response to public speaking as running from a dangerous predator).

Over time, the very stress response that is meant to ensure survival begins to have detrimental effects (Sapolsky, 2004). Short-term effects of continued exposure to stress include the following: disrupted sleep, loss of appetite, poor digestion, lack of energy, and low sex drive (Schubert, Lambertz, Nelesen, Bardwell, Choi, & Dimsdale, 2009). With sufficient rest and recovery, most people will see these symptoms abate, but humans are unique in that they tend to experience stress as prolonged and repeated encounters (e.g. graduate students are continuously stressed about meeting deadlines and making progress). Spending extraordinary amounts of time immersed in the final stage of the GAS, the exhaustion stage, is especially harmful; the immune system weakens and the body's energy reserves are depleted (Sapolsky, 2004). Chronic stress occurs when an individual feels overloaded; they do not have the necessary time and energy required for the task (Kanner, Coyne, Schaefer, & Lazarus, 1981). Long-term effects of chronic stress include elevated cortisol, which could trigger the onset of diabetes and obesity if left untreated. Other ailments associated with chronic stress are panic attacks, anxiety and depression; these ailments are related to breathing and mood dysregulation, as well as maladaptive coping styles (Holmes & Rahe, 1967).

Newer models of stress identify the subjective impact of life events, the meaning of the stressor to the individual, and how the stressor will influence social relationships too. The transactional model of stress posits that individual responses to stress vary based on the individual's appraisal of the stressor and their ability to effectively use available resources (Schuler, 1982). These appraisals can influence how people handle stressors both immediately

and long-term. Cohen (1984) and Cohen and McKay (1984) define primary appraisals as the initial reactions to the stimulus; the individual needs to assess her susceptibility to the stressor and the severity of the stressor before deciding how to proceed. Secondary appraisals occur when the individual assesses her resources and ability to handle the acute stressor; can she change the situation and manage her emotional reactions to the stressor? At this point, individuals are likely to experience distress or eustress in response to the stressor. Distress occurs when the individual feels overwhelmed and unable to effectively address the stressor; eustress occurs when the individual sees the stressor as a challenge and an opportunity to showcase their capabilities (Li, Cao, & Li, 2016). Experiencing distress compared to eustress may alter how people decide to cope with acute stressors. Coping mechanisms are often divided into two main types: problem-focused and emotion-focused (Lazarus & Cohen, 1977). Problem-focused coping occurs when the individual takes clear action to address the stressor in a way that will alleviate the severity of the stressor (e.g. if a student experiences stress over a large paper, but is confident in their abilities to complete the task, then they will spend time writing and editing). Emotion-focused coping occurs when the stressor becomes overwhelming and the individual addresses her own emotional needs, rather than taking steps to alleviate the stressor (e.g. a student is overwhelmed by a paper and watches hours of television instead of writing and editing). Both problem-focused and emotion-focused coping tactics are useful when applied correctly; problem-focused coping is most effective when the issue is changeable, but emotion-focused coping may be preferable if the problem cannot be solved, because the person encountering the stressor lacks the necessary skills or resources.

Furthermore, daily hassles (e.g. getting stuck in traffic) and daily uplifts (e.g. finding \$5 in the dryer) are more predictive of psychological stress and overall well-being than major life

events (Kanner et al., 1981). Major life events (e.g. getting married, losing a spouse, moving to a new city) are often stressful, but are less damaging in the long-term because eventually the major event will end. Daily hassles are related to chronic stress because people continuously encounter those hassles without any guaranteed reprieve (e.g. there will always be bills, traffic, taxes, etc.) Graduate students are a prime population for assessing chronic stress related to daily hassles; they are compelled to perform at consistently high levels academically, and failure, although common, is rarely discussed openly (Heins, Fahey, & Leiden, 1984).

Graduate students may also lack important social support systems to help alleviate the effects of daily hassles; despite trying to maintain relationships, graduate students often neglect relationships in order to focus on their studies. Graduate students have reported feeling guilt when they take downtime because the list of tasks is extensive (Rocha-Sing, 1994). Concerns over funding and being able to monetarily support oneself (as well as potential dependents) is of regular concern to graduate students too. Graduate students usually earn less money than their contemporaries who are employed full-time (Rocha-Singh, 1994). Saunders and Balinsky (1993) identified the following outcomes of chronic stress in graduate students: failing academically, employing maladaptive coping tactics, losing interpersonal relationships, and in some cases, dropping out of the program. Attrition is a serious and expensive problem for universities (e.g. paying tuition, health care, and fees for students who do not complete degrees) (approximately 50% of students who begin a doctoral program will drop out before degree completion; Bain et al. 2011) and thus current graduate student stress needs to be carefully examined.

When stressful experiences are approached as interactions between the situation and the individual's appraisal of the situation, we may be able to investigate how and when graduate students are likely to utilize adaptive vs. maladaptive coping. For instance, graduate students

may feel stressed about their ability to successfully propose and defend dissertations. While the appraisal of the dissertation is likely to involve stress, students who feel equipped with the necessary skills and support systems to be successful in their graduate programs may be more likely to complete large projects. Stress, especially eustress, may be beneficial and may increase productivity, but the stress response is still damaging in the long-term.

Resilience

Resilience has been defined in numerous ways; common themes include the ability to “bounce back” after failure and to effectively deal with stressors and disappointment (Kumpfer, 1999; Ledesma, 2014). Recent approaches to measuring resilience focus on assessing underlying internal or individual protective factors that buffer against stressors and promote positive adaptation, rather than simply identifying risk factors (Kumpfer, 1999). Werner and Smith (2001) identified four qualities of resilient people, 1) they actively attempt to solve a problem rather than avoid it; 2) they are able to maintain a sense of optimism despite challenges, for instance they see failure as an opportunity for growth; 3) they receive positive attention from others; and 4) they rely on faith to remain optimistic. Other studies have identified additional common qualities of resilient individuals: they have higher levels of optimism, empathy, competence, self-esteem, self-efficacy, conscientiousness, coping skills, determination, perseverance, and clear plans for goal achievement (Kumpfer, 1999; Kumpfer & Hopkins, 1993; Ledesma, 2014). Ledesma (2014) also discusses how personality, cognitive appraisal of the stressor, and meaning-making are internal factors of resilience, and availability of social support is an external factor of resilience. Overall, resilience is a dynamic process that involves both risk and protective factors.

Resilience is a beneficial quality especially for individuals who spend extended periods of time in competitive environments where failure is common. Graduate students are a prime population in which to study resilience because there are many pressures to perform at consistently high academic and professional levels, which is costly (in terms of time, finances, relationships, health, etc.; Heins et al., 1984; Saunders & Balinsky, 1993). People who spent more time on their educations (i.e. graduate students) reported less positive perceptions of academia, yet they still pursued their end goals (e.g. a degree) (Florida, 2006). This suggests that while the task may not be enjoyable, graduate students demonstrate resilience and an ability to accomplish challenging goals, as well as to recover from failure while working towards the ultimate end goal (e.g. a degree). Even if competition is not explicitly discussed, it is prominent among graduate students as a common, but problematic, norm (Anderson, Louis, & Earle, 1994; Lovitts & Nelson, 2000). Failure is also a common experience, but is rarely discussed openly; students may perceive their individual failures as unique, and these failures may cause them to further isolate themselves from the program (Bain, Fedynich, & Knight, 2011; Lovitts & Nelson, 2000; Wilson & Hardgrave, 1995). However, other students who approach failure as an opportunity to learn and grow may be more likely to complete their programs.

While there is general agreement about what resilience is (i.e. the ability to “bounce back” from challenging events) there is less consensus regarding if resilience is innate or something that can be learned. According to Werner and Smith (1982) and Wagnild and Young (1993) resilience should be thought of as both a process and a component of an individual’s personality; it is a combination of personality traits, social support, and experience. That is, some individuals may have certain personality qualities, such as conscientiousness, that determine how they approach stress and challenges (Bonanno, 2004). Regardless of innate traits, individuals

cannot become resilient if they never encounter any challenges and thus it is also reasonable to consider that resilience is something that can be learned and cultivated. For instance, the U.S. military has developed multiple programs to promote resilience because military personnel are routinely exposed to severe stressors and must learn effective coping mechanisms in order to fulfill their duties (Meredith et al, 2011; Myers, 2015).

Graduate program norms

Similar to other social groups, graduate school programs have established injunctive norms (what people should do) and deductive/descriptive norms (what people actually do) (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). It is important to consider how injunctive and deductive norms function and differ in academic programs as both of these types of unspoken norms guide behavior and expectations in ambiguous situations (Anderson & Louis, 1994). Merton (1942) identified four injunctive norms of the sciences and academia: universalism (scientific knowledge needs to remain separate from personal opinion), communality (ownership of knowledge should be shared and members of the organization should openly communicate about novel findings), disinterestedness (research is conducted for the sole purpose of learning the truth, not to advance personal agendas), and organized skepticism (academic findings should be examined critically and publicly). Ideally, academic programs should enforce these injunctive norms, but deductive norms in academic programs do not often mirror injunctive norms. Mitroff (1974) noted that common deductive norms in science were directly counternormative (i.e. contradictory) to the injunctive norms. Scientists reported behavior that matched the following deductive norms: particularism (research interests stem from personal interests), solitariness (research was often conducted alone and findings were not openly shared), self-interest (research questions were tailored towards personal interest and

advancement), and organized dogmatism (certain rules or beliefs have been established as truth and are not open to criticism).

Biglan (1973) suggested that academic disciplines have three separate dimensions on which to assess relevant norms and expectations: natural vs. social sciences, applied vs. basic research, and life vs. non-life. The climate of individual graduate programs can also influence which aspects are deemed most important; structure also guides decisions regarding appropriate behavior (i.e. formal and informal rules exist; when is it appropriate to utilize these rules and is there balance?) (Anderson & Louis, 1994). Programs that emphasize competition and formality are more likely to endorse counternormative behavior (e.g. success and individual recognition is paramount and therefore sharing important findings could jeopardize individual recognition; not sharing information becomes a prevalent counternormative behavior). Counternormative behavior is more common among international students and within natural science programs (Anderson & Louis, 1994). In the same study, students reported that the climate and quality of interpersonal relationships were important to their success and perception of their programs, but learning about technical aspects of the program and expectations were reported as more important than feeling welcome and receiving compassion.

Socialization is a common norm in academia; graduate students learn about departmental expectations, values, and attitudes commonly held by group members through interactions with faculty members and peers, and by achieving certain predetermined milestones (Anderson & Louis, 1994; Austin, 2002; Gardner & Barnes, 2007). Socialization is very contextual as each program has its own set of standards. Because students view faculty members as authority figures, students may also rely on faculty for demonstrating acceptable behavior and having

access to information that is trustworthy, but express frustration when feedback or mentoring skills are lacking (Austin, 2002).

The quality of involvement in graduate programs is unique to the graduate environment (Gardner & Barnes, 2007). Unlike undergraduate students, graduate students reported that professional development was more important than making friends in the program and students expected graduate programs to be more rigorous than undergraduate programs. Graduate students anticipated high levels of involvement and participation in program requirements, but also expressed that this involvement is expected to change over time (e.g. 1st year graduate students should expect to “pay dues” as research/teaching assistants, and should be more focused on classes and directly involved with departmental activities; advanced graduate students should be collaborating and networking with other professionals in the field at a national level). Programs with explicit rules about joining organizations and attending departmental activities typically have students who are more involved, compared to programs that imply which activities are important to attend. According to Sondergaard (2001), organizations, such as academic programs, often have either consensual (characterized by previously established rules and goals) or disensual (characterized by disorganization and disagreement) environments. Ambiguity is more common in disensual environments and thus clear norms and expectations are uncommon, which can make the socialization process challenging.

Many graduate students agree that their professional careers begin *during*, rather than after, graduate school; thus socialization is just as important as learning necessary skills, and can influence how skill acquisition takes place (Austin, 2002). Different levels of socialization can occur in tandem. For example, students who are repeat teaching assistants may develop a positive relationship with their faculty supervisors and understand interpersonal dynamics within

the department, but they are not exposed to new tasks that would generate skill acquisition due to the routine nature of teaching assistantships (e.g. regularly grading papers, developing lectures, creating exam questions). Factors such as self-efficacy and locus of control can further influence graduate student development and socialization. Students with a strong sense of self-efficacy and internal locus of control may be able to succeed in graduate programs that do not have socialization opportunities. For instance, programs that are disensual in nature and do not have clear expectations or support systems in place are often chaotic and disorganized (Sondergaard, 2001). In these environments, students are unlikely to have a clear understanding of program norms, lack exposure to professional development activities, receive insufficient feedback about personal progress, and have few opportunities to discuss problems and goals with faculty or peers (Austin, 2002). These types of negative experiences may be further exacerbated if severe power imbalances are present in the program of study.

Student expectations of mentors

Perceptions of professional power may vary by concentration and can have positive and negative connotations. For example, students prefer authority figures to be present when tasks are potentially dangerous or high risk is involved (e.g. nursing students who are learning to draw blood from patients need guidance rather than learning by trial and error) (Chan et al., 2017a). In general, students reported that instructors should have a certain amount of control while also encouraging autonomy in the student; mutual respect and encouraging growth is crucial in the student/instructor relationship. Approximately two-thirds of the students in the Chan et al., 2017a sample reported having a positive relationship with an instructor. The positive student/instructor relationship often had the following qualities: instructors provided honest and adequate feedback,

(constructive feedback was most effective when the instructor was also caring), students took initiative in their studies, and informal gatherings had occurred.

The previous study examined relationships between students and instructors in a hospital setting. While useful, this is a very unique setting and has additional pressures that may not exist in a typical graduate school program (e.g. the pressure to perform life-saving surgery). Chan et al. (2017b) further addressed the student/instructor relationship in a university setting from a Foucaudian perspective, which says that power is pervasive and inherent to certain structures and not the result of powerful individuals exercising strength (Foucault, 1977). Therefore, power should be studied from a bottom-up approach; it is necessary to examine who does not have power and investigate how the lack of power continuously influences the individual.

Chan et al. (2017b) collected data from focus groups with university students. They determined that students do report that different types of power (most often expert and coercive) are used in academic settings and that student expectations of the student/teacher interaction influences future interactions. For instance, a student may have had positive experiences where an instructor encouraged autonomy and pursuing research interests relevant to the student. The more positive experiences students have with instructors, the more likely future interactions will be positive too which can influence learning (e.g. a student who has had positive interactions with an instructor is more likely to consult the instructor on future questions and concerns). Overall, students agreed that instructors do and should have some power. The most effective student/instructor relationships take the appearance of authoritative parenting where rules and expectations are clear, but there is room for compromise and open dialogue regarding academic concerns.

Additional themes from the Chan et al., (2017b) focus groups included issues like friendly relationships in addition to academic relationships with instructors, degree of power, and degree of interaction. Polarizing views were noted in regards to friendship; some students perceived an outside friendly relationship as inappropriate while other students preferred this friendship with instructors. Students also disagreed about the degree of power students and instructors should possess, but they identified how they might alter their roles and take power using undesirable behaviors (e.g. ignore the instructor, stop going to class).

It has been established that students typically perceive instructors as authority figures in academic settings, but research on the type of relationship students prefer with instructors has some inconsistencies and the relationship between mentors and mentees can greatly influence student outcomes (Chan et al., 2017a; 2017b; Komarraju et al., 2010; Sidky, 2017). One common theme is that positive interactions between students and instructors, or mentors and mentees, improve the overall academic experience. Positive interactions influenced social-emotional well-being more than personal academic performance, especially when conversations were casual but about intellectual topics (Komarraju et al., 2010). Students who regularly met with faculty members also reported greater sense of academic self-concept and achievement; students who are more involved develop important professional relationships that contribute to their overall success, but boundaries are still important. Students consistently reported that one-on-one informal meetings between students and instructors is inappropriate. Respectful humor is a useful mechanism for creating positive learning environments, because the traditionally serious and stuffy environment of a classroom is removed. Using humor can improve student and teacher interactions, increase learning, encourage engagement with the course material, and help

students retain novel information (Abraham, Hande, Sharma, Wohlrath, Keet, & Ravi, 2014; Torok, McMorris, & Lin, 2004).

Faculty incivility is rude or disruptive behavior that interferes with the learning environment and delays progress. It occurs in academic settings, is detrimental to all those involved, and is influenced by the temporary nature of graduate mentee relationships and asymmetrical power balance (Itzkovich & Dolev, 2017). Incivility has three common qualities: it is subtle, the intention is ambiguous, and setting is relevant. Academic incivility can occur in active and passive forms and variations exist in how different approaches are used by faculty (Alt & Itzkovich, 2015). For example, an instructor who insults or reacts with anger to students who misunderstand concepts (active) or a mentor who delays or withholds approval for an important project until the mentee has completed other tasks for the mentor (passive). Students also influence this relationship to an extent; for instance, students who identify with minority groups may be exposed to more incivility. These students may utilize a variety of active and passive techniques (e.g. active: leaving the classroom, vocally protesting against the situation; passive: using silence [refusing to participate in discussion], dedication to task clearly waning over time). Mentor emotional intelligence is important because it inversely correlates with faculty incivility (Itzkovich & Dolev, 2017). Specifically, mentors with higher emotional intelligence are more likely to utilize emotion and thought along with social factors to self-express in appropriate ways. Such mentors also are more likely to have a basic understanding of social interactions and norms, and the ability to emotionally meet daily demands. Mentors with low emotional intelligence may be more likely to bully mentees and to expect compliance without being challenged by mentees. Exposure to incivility can influence graduate student experiences at a variety of levels and thus needs further investigation.

The Present Study

The present study is needed to identify the impact of stress on graduate students and how that perceived stress relates to the use of different coping tactics. While it seems reasonable to expect that better coping skills would lead to less stress, a relationship between the perceived impact of stress on well-being and coping tactics needs to be established because it is also likely that individuals are coping more *because* they are more impacted by stress. Therefore, the present study is needed to first identify the impact of stress in graduate students and how that is related to various coping tactics. The present study also examines how the mentor/mentee relationship is related to perceived stress. The relationship between mentors and mentees is crucial to a graduate student's success and completion and thus, findings of this study could also inform best practices for how mentors interact with graduate students. Finally, the present study also attempts to identify how graduate students interpret the meaning of academic and personal success.

Research Question 1

Are graduate students perceiving stress as impactful and how are the mentor/mentee relationship and coping skills relevant?

Hypothesis 1. As the value of resiliency increases, the relationship between discrepant actual and ideal mentor qualities (guidance, integrity, relationship) and perceived stress decreases.

Hypothesis 2. As the total number of weekly coping tactics increases, the relationship between discrepant actual and ideal mentor qualities (guidance, integrity, relationship) and perceived stress decreases.

Hypothesis 3: Graduate students who are the same biological sex as their mentors will report that perceived stress is less than graduate students who are not the same biological sex as their mentors.

Research Question 2

What are common requirements in graduate programs? What are common personal strivings for graduate students and how much overlap exists between those strivings and program requirements?

Hypothesis 4. Graduate students will report alignment between program requirements and personal goals.

Method

Participants

Ninety-nine graduate students were recruited from a large, public university in the Western United States via graduate program listservs and social media. Participants voluntarily signed up for the online study titled “graduate student experiences” and were asked to provide consent before being redirected to the online survey.

Research Design

Surveys were the most efficient approach for collecting responses; a large number of participants could be contacted quickly and easily, and attitudes could be assessed anonymously.

Outcome variables from the survey portion of the study included the impact of weekly stressful events on mentee well-being and personal strivings rankings.

The following constructs served as predictor variables: total coping mechanisms, resilience, and difference scores between ideal and actual mentor qualities on three levels:

guidance, integrity and relationships. Participant and advisor sex were also examined as predictor variables in hypothesis 3.

Materials and Measures

The Weekly Stress Inventory Short Form (WSI-SF; Brantley et al., 2007) was used to measure weekly levels of minor stressors. The WSI-SF is a 25-item scale with 7-point response options ranging from 0 (did not happen), 1 (happened, but was not stressful) to 7 (extremely stressful). Two possible scores were computed: an event score (did the stressor occur in the past week?) with possible scores ranging from 0 (none of the events happened) to 25 (all of the events happened); and an impact score (was the event stressful and if so *how* stressful?) The possible range of scores was 0-175 with higher total scores indicating that weekly stressors had greater impact. Sample items include “had too many responsibilities,” “forgot something,” and “did something you were not good at.” (Cronbach’s $\alpha = .91$). The WSI-SF was chosen for this study because it asks participants to identify how often a stressful event occurred; this measure also asks participants to identify if they considered the event to be stressful (i.e. it assessed the *impact* of the stressful event). Individuals may appraise certain events differently; one person may appraise the same event differently from another person who had experienced the same event. These appraisals alter how those individuals respond. For example, one of the items asks participants to identify if they had been stared at in the past week. Some participants were instructors of undergraduate classes and *not* being stared at could elicit more stress because it could suggest that students are disengaged or uninterested. This scale is preferable because it captures the amount of daily hassles encountered as well as the impact of those hassles.

The 14-Item Resilience Scale (RS14; Wagnild, 2010) was used to measure resilience; the RS14 is a 14-item scale with response options ranging from 1 (strongly disagree) to 7 (strongly

agree); total scores had a possible range of 14 to 98 (higher scores indicated greater resilience). The RS14 assesses various components of resilience: self-reliance (items 1, 5, 7, 12 and 14), meaningfulness (2, 9, and 13), equanimity (3 and 10), perseverance (6 and 8), and existential loneliness (4 and 11). Sample items include “I feel proud that I have accomplished things in life” and “My belief in myself gets me through hard times.” Cronbach’s alpha for the RS14 has consistently been between .89 and .96. The RS14 examines resilience as both trait and state; participants’ responses demonstrate certain innate qualities, but the scale also assesses one’s ability to respond to challenging events (Wagnild, 2016).

The Ideal Mentor Scale (IMS: Rose, 1999) identifies characteristics that are central to an ideal mentoring relationship, rather than any specific actual relationship. In order to capture both ideal and actual mentorship for the present study, the IMS was administered twice; once in its original form and a second time asking participants to respond based on their *actual* mentor’s behaviors and attributes. The IMS is a 34-item measure which utilizes response options ranging from 1 (not at all important) to 5 (extremely important); total scores had a possible range of 34 to 170 with higher scores indicating that the student’s ideal mentor has great integrity, guidance, and attention to personal relationships. Three subscales measured integrity, guidance, and personal relationships; scores are summed and higher scores indicate more importance. All items begin with the prompt “Right now, at this stage of my program, my ideal mentor would...” and sample items include “show me how to employ relevant research techniques,” “advocate for my needs and interests,” and “talk to me about his or her personal problems.” When participants respond to the IMS for the second time, they will be instructed to assess their own mentor on whether the mentor engages in each behavior, by choosing responses ranging from 1 (my mentor never does this) to 5 (my mentor always does this). The initial prompt will be altered to the

following: “Right now, at this stage in my program, my current mentor...” (Cronbach’s $\alpha = .77$ to .87).

The Brief COPE (Carver, 1997) was administered to assess different coping tactics graduate students may implement. The Brief COPE contains 14 subscales [self-distraction, (Cronbach’s $\alpha = .71$; items 1 and 19), active coping, (Cronbach’s $\alpha = .68$; items 2 and 7), denial (Cronbach’s $\alpha = .54$; items 3 and 8), substance use, (Cronbach’s $\alpha = .90$; items 4 and 11), use of emotional support, (Cronbach’s $\alpha = .71$; items 5 and 15), use of instrumental support, (Cronbach’s $\alpha = .64$; items 10 and 23), behavioral disengagement, (Cronbach’s $\alpha = .65$; items 6 and 16), venting, (Cronbach’s $\alpha = .50$; items 9 and 21), positive reframing, (Cronbach’s $\alpha = .64$; items 12 and 17), planning, (Cronbach’s $\alpha = .73$; items 14 and 25), humor, (Cronbach’s $\alpha = .73$; items 18 and 28), acceptance, (Cronbach’s $\alpha = .57$; items 20 and 24), religion, (Cronbach’s $\alpha = .82$; items 22 and 27), and self-blame, (Cronbach’s $\alpha = .69$; items 13 and 26)]. The Brief COPE is a 28-item measure that utilizes response options ranging from 1 (I haven’t been doing this at all) to 4 (I’ve been doing this a lot); total scores had a possible range of 28 to 112 with higher scores indicating more frequent coping. Sample items include “I’ve been getting emotional support from others,” “I’ve been giving up trying to deal with it,” and “I’ve been taking action to try to make the situation better.” The Brief-COPE is one of the most frequently used and valid measures to assess coping in a variety of contexts (Garcia et al., 2018; SOBC, 2020) and thus it was useful for assessing a variety of tactics that participants may utilize to cope with the stress of graduate school.

Demographic questions were included to assess relevant characteristics of the current sample. Participants will be asked to report the following: biological sex, gender identity, sexual orientation, veteran status, international student status, age, year in graduate school, program of

study, ethnicity, and marital status. These are common demographic parameters, but some questions have been added to assess qualities that are directly relevant to graduate students (e.g. program of study, year in the program). Minority students (such as international, non-cisgendered, and first-generation students) are likely to have unique experiences and it is important to include those perspectives. Participants will be asked to respond to each question as they are comfortable.

Measuring success

Participants were asked to identify the top 5 requirements emphasized by their respective programs of study in rank order (e.g. are publications more important than teaching?). Participants were then asked to identify 5 personal goals related to their academic careers and rank them in order of importance (e.g. publishing papers, contributing meaningful knowledge to one's field). The top 5 program metrics for success as identified by the participants were compared to personal goals identified by participants and were assessed for similarities.

Coding of Personal Strivings

Participants were asked to identify five personal goals related to their careers and list them in order of importance. Two independent coders categorized the open-ended responses according to the following categories: achievement, intimacy, affiliation, power, and other. The criteria for coding categories was informed by Emmons (1991) research on personal strivings; the first four categories are regularly used to describe different types of strivings and are indicative of motivation systems. The "other" category was included to capture strivings that did not clearly fit any of the above categories (e.g. "I want to enjoy my job," and "work-life balance"). The level of agreement between the two coders on personal strivings was assessed using Cohen's kappa (all five assumptions were met and the strength of agreement guidelines are

from Altman, 1999). Overall there was moderate to good agreement across the coders' judgements on each personal striving, [PS1: $\kappa = .611, p < .001$, PS2: $\kappa = .486, p < .0001$, PS3: $\kappa = .418, p < .001$, PS4: $\kappa = .429, p < .001$, PS5: $\kappa = .415, p < .0001$]. Discrepancies were reviewed until consensus was reached. A copy of the coding instructions are provided (See Appendix A).

Procedures

Participants were invited to complete the survey via Qualtrics with a provided link. Upon accessing the survey, participants were asked to provide electronic consent by selecting "I agree to participate in the following study" after reading the informed consent statement. Individuals who selected "I do not wish to participate in the following study" were directed to the last page of the survey, which thanks all participants for their time. Individuals who agreed to participate were asked to complete the aforementioned measures; demographic items were located at the end of the survey to avoid any potential issues with stereotype threat (Rydell, McConnell, & Beilock, 2009). The individual scales were presented in the following order in the survey: Actual Mentoring Scale, Brief Coping Scale, Ideal Mentoring Scale, Personal Strivings, Weekly Stress Inventory, and the Resilience Scale-SF14. Participants were asked to identify the top five program requirements from a list of commonly identified items, and then provided with an opportunity to share any thoughts about their graduate experiences at CSU. Once finished with the survey, participants were directed to a debriefing page and offered an opportunity to leave their name and email for a chance to win 1 of 6 \$50 Amazon gift cards as incentive for participation. They were also asked to indicate their interest in participating in a follow-up interview. 48 participants from the Colleges of Natural Sciences and Liberal Arts indicated that they were willing to be contacted for a follow-up survey. The Institutional Review Board (IRB)

of the associated university approved the commencement and all procedures described in this study (see Appendix I for IRB approval letter).

Data Analysis

Analyses were conducted using IBM SPSS Statistics 25 (IBM Corporation, Armonk, NY). Linear regression analyses were used to test the primary study hypotheses and age, biological sex, and year in graduate program were treated as controls due to their potential to influence the results (e.g. an older graduate student has more life experience and may have learned over time which coping mechanisms effectively reduce their stress). Control variables were dummy coded and predictor variables were centered on the mean before computing any interactions.

Prior to conducting the hierarchical regressions, the relevant assumptions of these particular analyses (i.e., linearity, no multicollinearity, homoscedasticity, the values of residuals are independent, normal distribution of the residual values, and absence of outliers) were tested and none were violated. First, scatterplots demonstrated that the relationships between the independent variables (difference scores of mentor integrity, guidance, relationship, and resilience) and the dependent variable (the impact of weekly stress) were all linear. VIF scores were well below ten and tolerance scores were above 0.2 which indicate that multicollinearity is not present in the data and thus, this assumption has been met that the predictor variables are not too highly correlated. The Durbin-Watson statistic showed that the values of the residuals were independent as the value fell between 1.5 and 2.5. This suggests that the observations are independent from one another (i.e. not correlated). Furthermore, the plot of standardized residuals versus the standardized predicted values showed no obvious signs of funneling, which suggests that the assumption of homoscedasticity has been met. According to the p-p plot for the

models, the values of the residuals are normally distributed. The plot points align closely to the diagonal line in each model. Finally, Cook's Distance values were all under the value of 1, which suggests that there are no individual cases greatly influencing the model. In the event of missing data, the individual cases were further examined. If participants failed to respond to at least 80% of the scale items, they were deleted from final analyses. Average imputation was utilized to enter individual scale points for participants who had responded to at least 80% of the survey.

A hierarchical regression was used to test hypothesis 1. After controlling for age, biological sex, college, and year in graduate program, potential main effects between the following mentor qualities (integrity, guidance, and relationship) and weekly stress were investigated; a potential main effect between resilience and weekly stress was also investigated before addressing how resilience and each mentor quality interacts to influence perceived stress.

To test hypothesis 2, a hierarchical regression was used to investigate the interaction between mentor qualities and the total number of coping skills used on the influence of weekly stress. After controlling for age, sex, and year in the program, main effects of total coping mechanisms used and mentor qualities on weekly stress were investigated. Finally, the third model assessed how mentor qualities interact with the number of coping skills used to influence the impact of weekly stress.

Hypothesis 3 was tested using a 2x2 factorial ANOVA which examined influence of both mentee (male or female) and mentor (male or female) sex on the impact of weekly stress.

Hypothesis 4 was more descriptive in nature, and thus chi-square analyses were used to identify the overlap between personal strivings and program requirements.

Results

Data for 87 participants was included in initial analyses after 22 participants were removed from the final analyses due to incomplete data (entire scales were missing which indicates that these participants skipped the corresponding page of the survey). Most participants identified as female (77.0%), heterosexual (82.8%), white (80.5%), and between the ages of 25 and 34 (71.3%). Descriptive data for the variables of interest are included in Table 1, full demographics are included in Table 2, and a correlation matrix for the variables of interest is included (Table 3).

Table 1
Study Variables of Interest

Variables	<i>M</i> (<i>SD</i>)	Observed		Possible	
		Min	Max	Min	Max
Difference Score: GUIDANCE	7.289(6.955)	0	30	0	170
Difference Score: INTEGRITY	13.50(14.427)	0	56	0	170
Difference Score: RELATIONSHIP	8.00(6.284)	0	32	0	170
Resilience	5.815(.829)	3.57	7	1	7
Number of coping tactics used	19.393(4.534)	2	28	0	28
Number of weekly stressful events	14.217(5.967)	0	25	0	25
Weekly stressful events	42.181(24.017)	0	106	0	175

Notes. Difference Scores: calculated as | ideal – actual |, thus higher scores indicate greater discrepancy between graduate student perceptions of ideal and actual mentors.

Table 2
Participant Demographics of Online Survey

Demographics		N(%)
Biological Sex		
	Male	19 (22.1%)
	*Female	67 (77.9%)
Sexual Orientation		
	Heterosexual or straight	72 (83.7%)
	Gay or Lesbian	4 (4.7%)
	Bisexual	6 (7.0)
	Pansexual	2 (2.3%)
	Questioning/Queer	2 (2.3%)
Age		
	18-24	9 (10.5%)
	*25-34	62 (72.1%)
	35-44	10 (11.6)
	45-54	4 (4.7%)
	55-64	1 (1.2%)
Race		
	White	70 (81.4%)
	Black or African American	5 (5.8%)
	Hispanic or Latino(a)	5 (5.8%)
	Asian	1 (1.2%)
	Native Hawaiian or Pacific Islander	1 (1.2%)
	Other	4 (4.7 %)
Current Year in Graduate Program		
	1 st	13 (15.1%)
	2 nd	14 (16.3)
	*3 rd	18 (20.7%)
	4 th	18 (20.7%)
	5 th	13 (15.1%)
	6+	10 (11.6%)
Affiliated College		
	Agricultural Sciences	1 (1.2%)
	Health and Human Sciences	7 (8.2%)
	Liberal Arts	22 (25.9%)
	Natural Resources	3 (3.5%)
	*Natural Sciences	43 (50.6%)
	Vet Medicine/Biomedical Sciences	9 (10.6%)
Veteran Status		
	Yes	2(2.5%)
International Student		
	Yes	5(6.2%)
Disability		
	Yes	5(6.2%)

Notes. *indicates reference groups of categorical controls in hierarchical regressions

Table 3
Correlation Matrix of Relevant Variables

	A	B	C	D	E	F	G
A. Number of stressful events	1						
B. Impact of stressful events	.783**	1					
C. Difference score between actual and ideal mentor guidance	.158	.184	1				
D. Difference score between actual and ideal mentor integrity	.171	.271*	.752**	1			
E. Difference score between actual and ideal mentor relationship	.313**	.275*	.485**	.540**	1		
F. Total number of coping tactics	.362**	.360**	.320**	.350**	.269*	1	
G. Resilience	-.152	-.421**	-.112	-.281*	-.294**	-.196	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Hypothesis 1

Three separate hierarchical multiple regressions were conducted to investigate the interactions of difference scores between ideal and actual components of mentor qualities and resilience on the impact of weekly stress. See Figure 1.

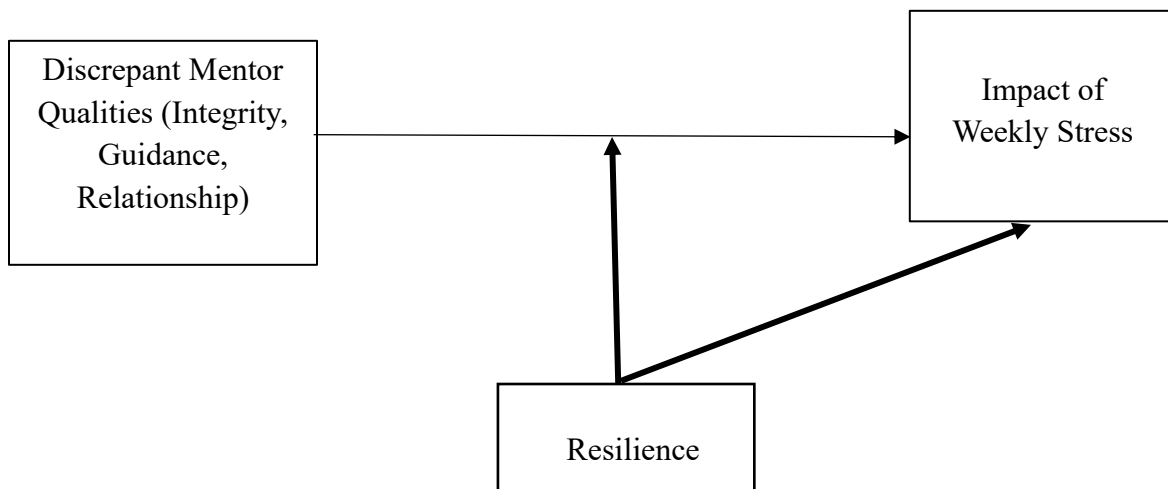


Figure 1. *Hierarchical regression model, hypothesis 1*

The first hierarchical multiple regression was run to assess the statistical significance of the interaction between the discrepancy in actual and ideal mentor guidance and resilience. The full model with resilience, the difference score between ideal and actual mentor guidance, the interaction between resilience and the guidance difference score to the predict perceived stress, while holding sex, age, year in program and college constant, was statistically significant, $R^2=.245$, $F(7,74)=3.436$, $p=.003$

The interaction between resilience and the difference score of mentor guidance did not yield a statistically significant increase in R^2 and thus it was dropped from the model, change in $R^2=.002$, $F(1,74)=.217$, $p=.643$. The new model, which examined the addition of resilience and the difference score between ideal and actual mentor guidance to the prediction of perceived stress, while holding sex, age, year in program and college constant, led to a statistically significant increase in R^2 of .236, $F(2, 75) = 11.690$, $p < .001$. This model revealed a statistically significant negative relationship between resilience and perceived stress ($b = -12.028$, $p < .001$).

The positive linear relationship between weekly stressors and difference scores between actual and ideal mentors on guidance was not significant ($b = .690$, $p=.055$) See Table 4.

Table 4
Hierarchical Regression for Hypothesis 1: Guidance and Resilience

Predictors	<i>b</i>	<i>SE</i>	<i>p</i>	ΔR^2
Step 1: Controls				.007
Sex	-3.874	6.731	.567	
Age	-2.677	6.130	.664	
Year in Program	1.216	6.721	.857	
College	-.316	5.689	.956	
Step 2: Main effects				.243***
Diff GUIDANCE	.690	.354	.055	
Resilience	-.859	.209	.001	
Step 3: Interaction				.245
DiffGUIDANCExResilience	-.012	.025	.643	

*** $p < .001$

The next hierarchical multiple regression was run to assess the statistical significance of the interaction between discrepancy in actual and ideal mentor relationship and resilience. The full model with resilience, the difference score between ideal and actual mentor integrity, the interaction between resilience and the integrity difference score to predict perceived stress, while holding sex, age, year in program and college constant, was statistically significant, $R^2=.245$, $F(7,75)=3.472$, $p=.003$

The interaction between resilience and the difference score of mentor integrity did not yield a statistically significant increase in R^2 and thus it was dropped from the model, change in $R^2=.000$, $F(1,75)=.005$, $p=.941$. The new model, which examined the addition of resilience and the difference score between ideal and actual mentor integrity to the prediction of perceived stress, while holding sex, age, year in program and college constant, led to a statistically significant increase in R^2 of .237, $F(2, 76) = 11.918$, $p < .001$. This model revealed a statistically significant negative relationship between resilience and perceived stress ($b = -10.560$, $p = .001$). The positive linear relationship between weekly stressors and difference scores between actual and ideal mentors on integrity was also significant ($b = .398$, $p = .026$). See Table 5.

Table 5
Hierarchical Regression for Hypothesis 1: Integrity and Resilience

	<i>b</i>	<i>SE</i>	<i>p</i>	ΔR^2
Step 1: Controls				.008
Sex	-3.399	6.745	.616	
Age	-3.512	6.117	.568	
Year in Program	1.797	6.731	.790	
College	.596	5.664	.916	
Step 2: Main effects				.245***
Diff INTEGRITY	.398	.175	.026	
Resilience	-10.560	3.022	.001	
Step 3: Interaction				.245
DiffINTEGRITYxResilience	-.013	.175	.941	
*** $p < .001$				

The third hierarchical multiple regression was run to assess the statistical significance of the interaction between discrepancy in actual and ideal mentor relationship and resilience. The full model with resilience, the difference score between ideal and actual mentor relationship, the interaction between resilience and the relationship difference score to the predict perceived stress, while holding sex, age, year in program and college constant, was statistically significant, $R^2=.234$, $F(7,74)=3.234$, $p=.005$.

The interaction between resilience and the difference score of mentor relationship did not yield a statistically significant increase in R^2 and thus it was dropped from the model, change in $R^2=.002$, $F(1,74)=.149$, $p=.701$. The new model, which examined the addition of resilience and the difference score between ideal and actual mentor relationship to the prediction of perceived stress, while holding sex, age, year in program and college constant, led to a statistically significant increase in R^2 of .224, $F(2, 75) = 10.962$, $p < .001$. This model revealed a statistically significant negative relationship between resilience and perceived stress ($b = -10.684$, $p = .001$). The positive linear relationship between weekly stressors and difference scores between actual and ideal mentors on relationship was not significant ($b = .794$, $p = .059$). See Table 6.

Table 6
Hierarchical Regression for Hypothesis 1: Relationship and Resilience

Predictors	<i>B</i>	<i>SE</i>	<i>p</i>	ΔR^2
Step 1: Controls				.008
Sex	-3.474	6.785	.610	
Age	-3.460	6.152	.575	
Year in Program	2.382	6.922	.732	
College	.846	5.729	.883	
Step 2: Main effects				.233***
DiffRELATIONSHIP	.794	.414	.059	
Resilience	-10.684	3.094	.001	
Step 3: Interaction				.234
DiffRELATIONSHIPxResilience	-.141	.365	.701	

*** $p < .001$

Hypothesis 2

Three separate hierarchical multiple regressions were conducted to investigate the interactions of different components of mentor qualities and coping on perceived stress. See Figure 2.

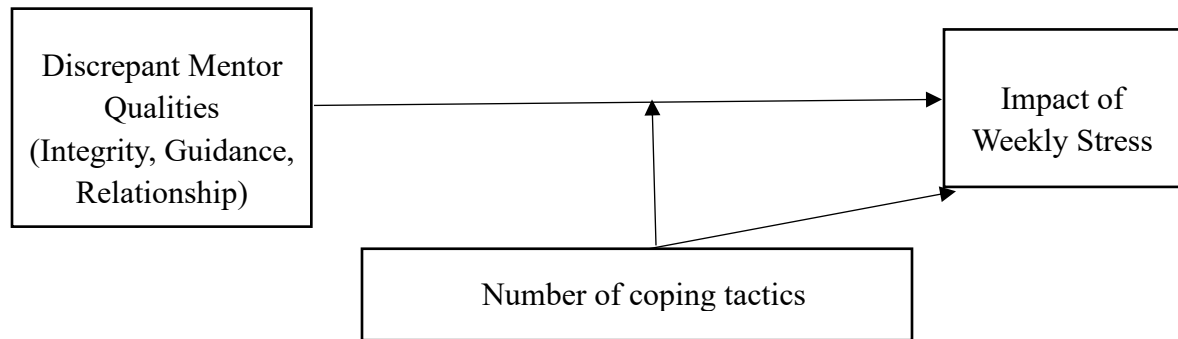


Figure 2. *Hierarchical regression model, hypothesis 2*

The first hierarchical multiple regression assessed the statistical significance of the interaction between discrepancy in actual and ideal mentor relationship and coping. The moderator effect of resilience was not significant, as evidenced by the addition of the interaction term, which only explained an additional 0.8% of the total variance, $p = .956$ and thus the interaction term was dropped from the model. The new model revealed a statistically significant positive linear relationship between perceived stress and coping ($b = .265$ $p = .019$) and a statistically significant positive linear relationship between perceived stressors and the discrepancy between actual and ideal mentor relationships ($b = .263$, $p = .038$). See Table 7.

Table 7.

Hierarchical Regression for Hypothesis 2: Relationship and Coping

Predictors		<i>b</i>	<i>SE</i>	<i>p</i>	ΔR^2
Step 1: Controls					.008
	Sex	-3.474	6.785	.610	
	Year in Program	2.382	6.922	.575	
	Age	-3.460	6.152	.732	
	College	.846	5.729	.883	
Step 2: Main effects					.174***
	DiffRELATIONSHIP	1.006	.420	.019	
	Coping	1.414	.590	.019	
Step 3: Interaction					.182
	DiffRELATIONSHIPxCoping	.063	.076	.406	
*** <i>p</i> <.001					

The second hierarchical multiple regression assessed the statistical significance of the interaction between discrepancy in actual and ideal mentor integrity and coping. The moderator effect of resilience was not significant, as evidenced by the addition of the interaction term, which only explained an additional 0.8% of the total variance, $p = .961$ and thus the interaction term was dropped from the model. The new model revealed significant main effects of both coping ($b = .245$, $p = .032$) and discrepancy in actual and ideal mentor integrity ($b = .270$, $p = .017$) on perceived stress. See Table 8.

Table 8

Hierarchical Regression for Hypothesis 2: Integrity and Coping

Predictors		<i>b</i>	<i>SE</i>	<i>p</i>	ΔR^2
Step 1: Controls					.008
	Sex	-3.399	6.745	.616	
	Year in Program	-3.512	6.731	.790	
	Age	1.797	6.117	.568	
	College	.596	5.664	.916	
Step 2: Main effects					.167***
	DiffINTEGRITY	.448	.184	.017	
	Coping	1.306	.599	.032	
Step 3: Interaction					.006
	DiffINTEGRITYxCoping	.028	.039	.477	
*** <i>p</i> <.001					

The third hierarchical multiple regression was run to assess the statistical significance of the interaction between discrepancy in actual and ideal mentor guidance and coping. The moderator effect of resilience was not significant, as evidenced by the addition of the interaction term, which only explained an additional 0.7% of the total variance, $p = .967$ and thus the interaction term was dropped from the model. The new model revealed a significant main effect of coping ($b = .268$, $p = .021$) on perceived stress. See Table 9.

Table 9
Hierarchical Regression for Hypothesis 3: Guidance and Coping

		<i>B</i>	<i>SE</i>	<i>p</i>	ΔR^2
Step 1: Controls					.007
	Sex	-3.874	6.731	.567	
	Year in Program	1.216	6.721	.857	
	Age	-2.677	6.130	.664	
	College	-.316	5.689	.956	
Step 2: Main effects					.136***
	DiffGUIDANCE	.645	5.437	.101	
	Coping	1.425	.389	.021	
Step 3: Interaction					.0150
	DiffGUIDANCExCoping	.094	.085	.271	
*** $p < .001$					

Active coping, planning, and use of emotional support were identified as the top three types of coping used in the sample (see Table 10 for additional subscale information) and correlations between each Brief Cope subscale were conducted to identify any overlap between types of coping (See Table 11). The subscales are meant to be examined individually, but it is possible that some of the subscales may be related to each other (i.e. certain subscales may measure different forms of problem-focused coping and emotion-focused coping). Use of instrumental and emotional support, and planning and active coping both demonstrated strong positive relationships.

Table 10
Descriptive Statistics of the Brief COPE subscales

Type of Coping	<i>M</i>	<i>SD</i>	Min	Max
Active Coping	6.13	1.40	2.00	8.00
Planning	5.99	1.65	2.00	8.00
Use of Emotional Support	5.95	1.70	2.00	8.00
Use of Instrumental Support	5.61	1.79	2.00	8.00
Acceptance	5.57	1.62	2.00	8.00
Self-Distraction	5.50	1.59	2.00	8.00
Positive Reframing	5.40	1.78	2.00	8.00
Humor	4.81	1.89	2.00	8.00
Self-Blame	4.64	1.68	2.00	8.00
Venting	4.27	1.63	2.00	8.00
Substance Use	3.31	1.74	2.00	8.00
Religion	3.31	1.97	2.00	8.00
Behavioral Disengagement	2.65	1.28	2.00	8.00
Denial	2.51	1.42	2.00	8.00
Total Number of Coping Tactics Used	19.39	4.53	2.00	28.00

Table 11
Correlation Matrix of Brief COPE subscales

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
A. SELF-DISTRACTION	1													
B. ACTIVE COPING	.176	1												
C. DENIAL	.318**	-.082	1											
D. SUBSTANCE USE	.363**	-.121	.351**	1										
E. EMOTIONAL SUPPORT	.295**	.412**	.075	.017	1									
F. INSTRUMENTAL SUPPORT	.367**	.467**	.199	-.073	.758**	1								
G. BX DISENGAGE	.199	-.331**	.419**	.381**	-.180	-.065	1							
H. VENTING	.347**	.205	.293**	.204	.379**	.504**	.237*	1						
I. POSITIVE REFRAMING	.209	.508**	-.011	-.002	.471**	.352**	-.282**	.260*	1					
J. PLANNING	.292**	.712**	.095	.035	.394**	.483**	-.173	.310**	.626**	1				
K. HUMOR	.285**	.250*	.154	.165	.383**	.269*	-.147	.431**	.516**	.338**	1			
L. ACCEPTANCE	.282**	.366**	.193	.128	.298**	.334**	.043	.521**	.544**	.538**	.515**	1		
M. RELIGION	.069	.151	.227*	.021	.289**	.336**	.019	.337**	.207	.223*	.349**	.352**	1	
N. SELF-BLAME	.507**	.041	.438**	.279*	.180	.181	.274*	.424**	.222*	.220*	.366**	.381**	.045	1

Notes. * $p < .05$

** $p < .001$

Hypothesis 3

A 2x2 factorial ANOVA was conducted to examine effects of mentee sex and mentor sex on perceived stress (Table 12). The main effect of mentee sex on perceived stress [Male: $M=39.64$, $SD=22.92$ and Female: $M=41.63$, $SD=23.94$] was not significant $F(1,75)=0.09$, $p=.76$. The main effect of mentor sex on perceived stress [Male advisor: $M=41.56$, $SD=22.43$ and Female advisor: $M=41.44$, $SD=24.61$] was not significant $F(1,75)=0.00$, $p=.99$. There was no significant interaction between mentee sex and advisor sex regarding perceived stress $F(1,75)=.004$, $p=.95$.

Table 12
Mentee Sex X Mentor Sex and the Impact of Weekly Stress Analysis of Variance

Source	<i>df</i>	<i>F</i>	<i>p</i>
(A) Mentee sex	1	.091	.764
(B) Mentor sex	1	.000	.992
A x B (interaction)	1	.004	.948
Error (within groups)	75		

Hypothesis 4

Participants were asked to rank the top five requirements in their respective programs from a list of common requirements. The top five program requirements, regardless of program, in rank order of importance included the following: 1) thesis or dissertation, 2) publications, 3) qualifying competencies, 4) teaching experience, and 5) professional presentations (See Table 13). The thesis / dissertation was consistently ranked as the most important program requirement by a majority of the participants. However, when asked to list their top 5 goals related to academic careers, only 7 (8.0%) participants included the thesis or dissertation as a personal goal. Achievement-based strivings accounted for 44.4% of all types of strivings mentioned, followed by “other” types of strivings. 31% of participants identified “happiness” as a top five

personal striving. Happiness was not included as a top five program requirement and thus any overlap could not be compared (i.e. happiness was not provided as an option on the list of common requirements).

Table 13
Personal Strivings Rank by Type

Type of Striving	Achievement	Intimacy	Affiliation	Power	Other
Rank 1	36	11	2	7	22
Rank 2	36	11	5	10	16
Rank 3	34	11	11	8	14
Rank 4	38	6	10	11	10
Rank 5	25	11	14	6	16
Total	169	50	42	42	78

Chi-square tests of independence were conducted to examine the relationship between the top five program requirements and personal strivings (see Table 14). The relationship between the thesis/dissertation as a top five program requirement and the thesis or dissertation as a personal striving was not significant, $X^2(1) = .771, p = .380$. The relationship between publications as a top five program requirement and publications as a personal striving was not significant, $X^2(1) = .242, p = .623$. The relationship between qualifying exams/comps as a top five program requirement and qualifying exams/comps as a personal striving was not significant, $X^2(1) = .749, p = .387$. The relationship between teaching as a top five program requirement and teaching as a personal striving was not significant, $X^2(1) = .302, p = .583$.

Additional chi-square tests of independence were conducted to examine the relationship between affiliated college (Natural Sciences: $N=45$, and Liberal Arts: $N=22$) and requirement importance. Natural Sciences and Liberal Arts programs were included in the analyses because other programs did not have enough respondents to make valid comparisons.

Table 14

Top 5 identified program requirements as personal strivings comparisons

	Thesis/Dissertation	Publications	Comprehensive Exams	Teaching	Professional Presentations
Times included in top 5 prog req	79 (90.8%)	58 (66.7%)	50 (57.5%)	58 (66.7%)	29 (33.3%)
Times included as PS (when also mentioned as top 5 requirement)	7 (8.8%)	17 (29.3%)	1 (2%)	17 (29.3%)	0

Notes. Times included as PS and mention of top 5 requirement presented to demonstrate existing overlap between requirements and personal strivings.

The relationship between affiliated college and ranking publications was significant, $X^2 (1) = 6.641, p = .010$; Natural Sciences students were more likely to identify research publications as a top 5 program requirement than Liberal Arts students. The relationship between affiliated college and ranking qualifying exams or comps as a top 5 requirement was statistically significant, $X^2 (1) = 9.678, p = .002$; Liberal Arts students were more likely to identify qualifying exams as a top 5 program requirement than Natural Sciences students. The relationship between affiliated college and ranking the thesis or dissertation in the top 5 was not significant, $X^2 (1) = 1.214, p = .271$. The relationship between affiliated college and teaching experience was not significant, $X^2 (1) = .361, p = .548$. Affiliated college and including professional presentations as a top 5 program requirement were not statistically related, $X^2 (1) = .061, p = .806$.

Discussion

The current study was conducted to shed light on common factors that influence graduate students' levels of stress, such as resilience, amount of coping skills used, and the difference between actual and ideal mentor qualities.

Hypothesis 1 (as the value of resiliency increases, the relationship between discrepant actual and ideal mentor qualities (guidance, integrity, relationship) and perceived stress decreases) was not supported. However the association between resilience and perceived stress demonstrated that individuals who reported greater resilience reported that weekly stressors were less impactful.. The impact of stress was also influenced by the perceived integrity of participants' advisors. Participants who reported greater discrepancies between ideal and actual mentor integrity (actual mentors were perceived as having less integrity than ideal mentors) reported that weekly stressors were more impactful. The findings of hypothesis 1 are consistent with research from Florida (2006) which addresses the importance of resilience when working on unpleasant tasks or goals. Graduate students in this study consistently reported feeling stressed, but they also demonstrated consistently high levels of resiliency which is related to stress reduction.

Hypothesis 2 (as the total number of weekly coping tactics increases, the relationship between discrepant actual and ideal mentor qualities (guidance, integrity, relationship) and weekly stress decreases) was also not supported by the present data. The current study sought to establish a relationship between the total number of coping tactics used and perceived stress. A positive relationship existed between the number of coping tactics and perceived stress. This suggests that individuals use more coping tactics when the effect of weekly stress is greater, but it could also mean that the participants experienced great levels of stress and thus were more reliant on coping tactics. This study successfully established that the total number of coping skills increases when perceived stress also increases. Additional analyses examined relationships between different types of coping. In general, graduate students who utilized instrumental support were also likely to utilize emotional support. Students who took an active approach in

their coping were also more likely to utilize positive reframing (e.g. failing an exam is an opportunity to learn and meet with an instructor) and planning. However, it is important to note that the study did not assess stress at more than one time point. It is possible that some participants were utilizing more coping tactics because they had more stressors at the time of the survey (data collection occurred at the end of the semester, partially during finals week). Future studies could explore the various *types* of coping tactics to determine if specific coping tactics are related to perceived stress as well as when certain coping tactics are likely to be implemented (i.e. are emotion-focused tactics utilized more during the middle of the semester compared to finals week?)

Mentor integrity was consistently related to weekly stress. The findings suggest that when there is greater discrepancy between actual and ideal mentor integrity, graduate students feel greater effects of weekly stress. Coping tactics were utilized more often when the relationship between graduate students and their advisors did not meet graduate student expectations. These findings suggest a negative relationship between perceived stress and certain mentor qualities; graduate students experience less stress when they have mentors who demonstrate respect, virtue, principles, and encourage mentees to make informed decisions for themselves. Furthermore, graduate students who did not have strong relationships with their advisors used more coping behaviors; the students who lacked strong relationships expressed a desire for mentor interactions that were more personal, open, and not rigidly based in academic discussion (e.g. they can have conversations about personal concerns and goals). Chan et al (2017a; 2017b) also demonstrated the importance of the mentor/mentee relationship. Students from these studies expressed desire for mentor/mentee relationships founded in mutual respect and having integrity, but the findings from the Chan studies were less consistent regarding the

degree to which mentors and mentees should discuss topics outside of academia. Chan (2017b) presented polarizing views from students regarding friendship; some students wanted to be friends with their mentors outside of academia and others did not want to be friends (they did not think it was appropriate for mentors and mentees to be friends). The findings from the present study and the Chan studies provide important insight; graduate students prefer mentors who are respectful and caring, but professional boundaries still need to be considered because of the inherent power differences between mentors and mentees. The present study also provides evidence to suggest that the mentor's sex is not related to graduate students' perceptions of weekly stress. Participants who identified themselves as biologically male or female did not differ in how they perceived stress either.

When the present participants were asked to identify the top five most important requirements of graduate programs, theses and dissertations were consistently reported as a top requirement, followed by publishing papers, and gaining teaching experience. Upon closer inspection, research publications were included in the top five requirements in Natural Science programs more so than in Liberal Arts programs. Liberal Arts students were more likely than Natural Science students to report qualifying exams as a top 5 requirement of the program. Interestingly, there was minimal overlap between the top program requirements and self-reported personal strivings. Publications and teaching experiences or job positions were mentioned numerous times as personal strivings, but other program requirements failed to be regularly included in the participants' personal career goals regardless of affiliated college.

Implications

Because graduate school can be a stressful environment, it is important to investigate which factors are related to stress reduction. The present study confirmed the importance of

resilience and coping skills for managing weekly stress, but certain relationships unique to graduate school (namely the mentor/mentee relationship) can also influence the impact of stressful events. Students who reported greater resilience, affective coping skills, and respectful advisors still had stressful experiences, but the impact of that stress was not as severe.

Students with mentors rated lower on integrity and students who did not have any kind of non-academic relationship with their advisor reported greater impact from stressful events. This speaks to the importance of the role between mentor and mentee; students may expect their mentors to assist in socializing them to academic environments, but this is not always the case. When students are unsure of program requirements or expectations for professional behavior, the mentor should be a source of information; students routinely identify mentors as individuals who have authority and knowledge that students do not yet possess (Chan et al, 2017b). When this source of information is unavailable, graduate students may experience more stress and uncertainty about their degree and success. Disensual environments (in which the requirements for success are not clear or are inconsistent) foster chaos and disorganization, which interferes with skill development and acquisition, but the effects of such environments can be mitigated when individuals feel competent and in control of their situations (Austin, 2002; Sondergaard, 2001).

Resilience is an important quality for graduate students to possess; graduate school is a challenging environment often marked by failure and thus, the ability to “bounce back” from failure is crucial. Graduate programs may want to consider assessing certain characteristics (such as coping style and resilience) among current and incoming graduate students to develop more tailored plans for students to be successful while moving forward in their respective

programs. Discussing challenges and helping students build resilience is another opportunity to foster the mentor/mentee relationship as well.

Limitations

The current study is not without its limitations. It was discovered during data cleaning that two items from the guidance subscale of the Ideal and Actual Mentor Scales were missing from the survey. Despite the two missing items, both the actual mentor scale and the ideal mentor scale demonstrated acceptable internal reliability, but any causal relationships should be interpreted with caution. With regard to coping, it is possible that participants utilized a certain coping tactic that was not included in the Brief COPE (e.g. coloring, composing music, doing yoga for stress relief). Future studies of this nature should provide participants with an open-ended question to identify other possible coping tactics.

An additional limitation is related to sampling. Recruitment emails were sent to participants right as the semester was ending so many students were unavailable to participate. Furthermore, recruitment emails were sent via listservs which required administrator approval. If the listserv admin did not approve the recruitment e-mail, then entire departments were excluded from the recruitment process. Two colleges were well represented, but there are 8 colleges within the targeted university, so the representation of only 2 in significant numbers limits the ability to generalize findings to the university as a whole and to other, larger populations. The location of the study also limits the generalizability of the findings as it was conducted at a predominantly white school in the western U.S.

Initially the researchers had intended to compare the rankings of personal goals and program metrics to determine whether program and personal goals aligned and whether students consistently identify similar goals based on their associated programs (e.g. graduate students in

counseling psychology identify the importance of internships vs. graduate students in chemistry identify research publications as a top priority). Unfortunately, the limited sample size did not permit these types of comparisons. It is also worth noting that the top 5 program metrics were supplied by the same person who was asked to identify their own personal academic goals. There could be some risk of individuals overestimating how much emphasis their program places on a task because they themselves prioritize the task. This lack of overlap may also be due to the type of language used during data collection. Participants were asked to identify *personal* rather than *professional* strivings. The current findings suggest that the two may not be mutually exclusive given what is most salient at the time (i.e. personal has a different connotation from professional and thus the interpretation may have varied).

Future Directions

Future studies can help to clarify issues raised here regarding the current topic and should further investigate graduate student experiences. Coping was consistently identified as an effective predictor of perceived stress and thus future research could examine what types of coping behaviors are utilized by graduate students and which coping behaviors are most effective at reducing weekly stress because not all coping skills included in the BRIEF-COPE are helpful for solving graduate-school related problems (e.g. substance use may temporarily reduce emotional distress, but neglecting to work on projects in favor of substance use could increase weekly stress).

Findings for the importance of mentor qualities are still rather inconclusive and thus additional studies should examine this relationship further. Previous studies have identified the mentor/mentee relationship as a crucial element of the graduate student experience (Bain et al, 2011; Chan, Tong, & Henderson, 2017b; Kyvik & Smeby, 1994; Itzkovich & Alt, 2016), but the

ways in which this relationship functions as a part of success, stress, and resilience are not clearly understood. Other considerations to be investigated in larger and more diverse samples include how gender influences the mentor/mentee relationship. It is likely that the gender of the mentor and the gender of the mentee can influence interactions, and thus it is important to investigate how masculine and feminine qualities influence interactions between mentors and mentees. Masculine and feminine qualities may also be linked to perceptions of work-life balance and its apparent importance.

Conclusion

In an environment where “only the strong endure” resilience and effective coping strategies are invaluable to students who wish to pursue their passions in higher education. In addition to resilience and coping, understanding the expectations and interactions that are common in graduate programs, specifically between mentors and mentees, may also address common needs of graduate students (i.e. graduate student support and advocacy). Graduate school is a challenging endeavor that is often marked by uncertainty: uncertainty of one’s capabilities, one’s social standing, and the future. However, graduate school is also an environment that can foster growth, learning, and passion for pursuing truth given the right circumstances.

“You are never strong enough that you don’t need help.”

-Cesar Chavez

CHAPTER III: “TAKE A SWIM IN LAKE ‘YOU’”; REFLECTIONS ON MOTIVATION AND GRADUATE SCHOOL

Graduate school is notorious for being a challenging endeavor and there is no guarantee of external rewards (e.g. a job, financial security) upon completion (Golde, 2005; Raisman, 2013). On average, students spend 4-6 years in doctoral programs and have \$98,800 in student loan debt upon completion (debt indicates ALL debt, not just graduate school) (*The Condition of Education*, 2018). One may wonder what the allure of a graduate degree could possibly be, given this information. Individuals who choose to pursue challenging tasks often do so because they believe that there is some personal benefit in pursuing these tasks, or because the tasks have intrinsic value (Deci and Ryan, 2000), and it is likely that this type of intrinsic motivation is applicable to individuals who decide to pursue a graduate degree

Relevant Theoretical Framework

Self-Determination Theory (SDT)

Self-determination theory (SDT) has been utilized in a variety of contexts, especially applied settings (e.g., education and physical health) (Evans, 2015; Ryan, Williams, Patrick, & Deci 2009), and examines motivation across different settings and factors that contribute to or hinder motivation (Ryan & Deci, 2000) see Figure 3. SDT examines how psychological needs influence whether individuals experience desirable outcomes (task completion) or undesirable outcomes (task failure). Motivation compels individuals to engage in and complete tasks, but the underlying desire can be intrinsically or extrinsically based. *Intrinsic motivation* occurs when an individual chooses to engage in a behavior for personal reasons (e.g., it makes them happy, they feel connected with others, they experience personal growth); intrinsic motivation is important

for continued growth and social development. Graduate school programs do not guarantee extrinsic rewards besides a degree upon program completion and greater esteem in the eyes of others (e.g. a job upon program completion is not guaranteed) and thus intrinsic motivation is likely to influence whether individuals complete graduate programs; they see inherent value in the educational process and will push beyond challenges and failure because the process itself is personally motivating. *Extrinsic motivation* occurs when individuals engage in a particular task or behavior because there is external pressure to do so (e.g., the task is required by a job, the individual will be rewarded with money or recognition if task is completed). Motivation can occur both at a conscious and subconscious level and both intrinsic and extrinsic motivation can help a person accomplish their goals. Motivation can also be autonomous or controlled.

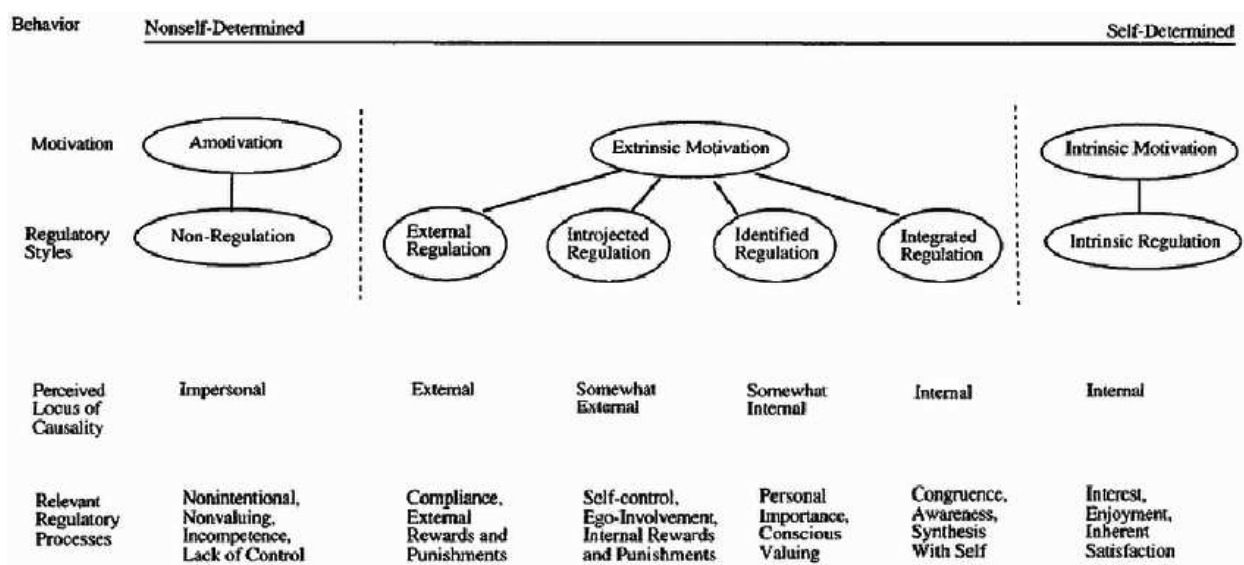


Figure 3. *Self-Determination Theory Continuum of Motivation (Ryan and Deci, 2000).*

Autonomous motivation occurs when the individual engages in a freely-chosen behavior. Autonomous motivation can be energizing for individuals if they experience satisfaction as a

result of the behavior, especially when the decision to engage in a given behavior stems from intrinsic motivation. These outcomes tend to be more gratifying and positive in nature. However, extrinsic motivation can involve a certain level of autonomous motivation as well and outcomes vary based on how much autonomy is perceived. Integrated regulation is the most autonomous form of extrinsically-based motivation; the individual reports that the outcomes are important, personally relevant, and have been integrated with the individual's personal values. Regulation through identification occurs when an individual reports that they value a certain rule or goal, and thus it has personal relevance, but has not yet been integrated into that person's set of values. Introjected regulation of behavior occurs when an individual conforms to the norms of the environment, but they do not personally endorse those values or norms. Finally, externally regulated behavior is considered the least autonomous because behavior is only the result of external factors; the individual does not view the task or goal as personally relevant or important. When rationale for engaging in a task is provided, people may be more likely to complete tasks, even if the tasks are initially viewed as boring or unimportant (Jang, 2008).

Controlled motivation occurs when a person engages in the specified task because they feel obligated to do so, regardless of their desire to engage in the task (e.g. they are told what to do and how to accomplish the task). When individuals experience controlled motivation they are influenced by external factors, but the outcome tends to be negative. This occurs when individuals complete a task, but are not satisfied after doing so and they may feel depleted (emotionally, mentally, physically). Repeated experiences with controlled motivation may lead to amotivation, which is characterized by lack of both intention and general motivation.

Ryan and Deci (2000) refer to three basic psychological needs inherent to autonomous motivation: autonomy, competence, and relatedness. Autonomy occurs when an individual is

able to self-govern and make decisions on their own, competence examines whether or not the individual feels like they possess the necessary skills to complete the task, and relatedness investigates how the specific activity connects the individual with others (Connell & Wellborn, 1991). Satisfaction of these needs varies by person and two concepts that SDT research has found are useful for predicting whether these needs are satisfied include causality orientations (autonomous, controlled, or interpersonal) and life goals (e.g. intrinsic goals: belonging, self-growth; extrinsic goals: wealth, fame, recognition) (Deci & Ryan, 2008). Individuals who report more intrinsic life goals and aspirations tend to experience better health outcomes and overall well-being compared to individuals who routinely behave for external rewards.

Furthermore, it is important to examine causality orientations, or the way that individuals adjust to behavioral demands of the given environment and their general self-determination across a variety of situations. Graduate programs are environments with high demands, but these demands and expectations are not always clear. Graduate students need to be able to adapt to and excel in a variety of situations; they may have different professional responsibilities throughout their academic careers and each job may have its own unique demands. For instance, a graduate teaching assistant has different demands (meeting with students, developing exams, preparing lectures, grading papers, etc.) from a graduate research assistant (collecting and analyzing data, formulating hypotheses, collaborating on manuscripts). General self-determination can vary based on how enjoyable the individual person finds each job; positive correlations between enjoyment and confidence for a specific task have been identified (Martin, 2007). One person may enjoy teaching more than conducting research, and thus if they are assigned to a teaching position are likely to experience heightened feelings of autonomy, competence, and relatedness because they are confident. However, this same individual may lack feelings of competence if

they are not confident in their ability to generate meaningful research. This can negatively influence autonomy; individuals who do not want to spend hours in a lab, but must do so as a requirement of their graduate program, are more likely to resent their time in the program and are not as intrinsically motivated to complete their degree compared to individuals who elected to spend most of their time conducting research.

The Present Study

Motivation has been identified as an important predictor of enduring long-term, high-demand and thus stressful, experiences (Bonanno, 2004; Deci & Ryan, 2008; Ledesma, 2014; Ryan & Deci, 2000). Intrinsic motivation has been identified as a predictor of graduate student success (Rakes & Dunn, 2010) and the current study will further explore which types of motivation are common in graduate students and how the decision to pursue a doctoral degree is related to SDT.

Research Question

What are common experiences for graduate students? What is the relevance of Self-Determination Theory in a graduate student population?

Reflexivity Statement

The primary investigator of the present study was a graduate student in a natural sciences program where the study was conducted and has both personal and professional interest in the topic. Initially, the PI was advised *not* to conduct this study because it might “rock the boat” and create both personal and professional complications. However, it is because of that conversation that the PI recognized that there was an immense need for this project and sought out committee members who were supportive of the topic and agreed that it was an important area of inquiry. In personal conversations with other graduate students, it became clear that many graduate students

were frustrated with their current situations yet the majority pressed-on despite numerous setbacks. The PI herself experienced numerous setbacks (e.g. three prior dissertation proposals were fruitless and in part, that consistent failure generated the PI's interest in the current topic), and often questioned why she was spending an immense amount of time in a program where she felt stuck and uninspired. At times, graduate school felt incredibly isolating and lonely; did other graduate students feel the same way? Why had no one asked them and why were people anxious to keep these voices silenced?

I recognize that my own experience biased the way that I approached initial conversations with fellow graduate students before conducting this study. For this reason, I did not invite peers within my own program to participate in this study (even though most whom I spoke with volunteered to share their experiences). I did not want my own frustrations and cynicism to set the tone for interactions with graduate students with whom I had no prior relationships and thus felt it was necessary to have a framework guide the current study and semi-structured interviews. I have great respect for graduate students because of the many challenges they experience, but I needed to find out if my initial years were unique or if the problem was much larger. In order to have honest and genuine conversations with fellow graduate students, I needed to understand my own reasons for conducting this research. Exploring my own graduate experience has made me eager to listen to other students' stories with an open mind. It is my hope that my peers felt inspired and heard.

Method

Participants

Twenty-one graduate students from a large, public university in the Western United States completed the interview; 12 students were from the University's Natural Science

programs and 9 were from its Liberal Arts programs. Forty-eight graduate students from the Colleges of Liberal Arts and Natural Sciences indicated interest in being interviewed after participating in a related survey. Fourteen respondents were excluded from the interview in order to avoid issues related to conflict of interest (i.e. these students were from the same department conducting the study). The remaining thirty-three graduate students were invited to participate in the interview and of those students, twenty-one responded and agreed to be interviewed. All participants were doctoral students and had been in their respective programs for at least two years (number of years in program: $M=3.62$ years). The majority of participants identified as female (81%) and were between the ages of 25 and 34 (71.4%).

Research Design

Interviews can be beneficial in that they often utilize open-ended questions, which allow the participants to offer more complete responses and the ability to describe specific examples in detail. Because graduate student experiences can vary greatly for a variety of reasons, such as mentor style, departmental climate, and available support systems, the interview approach was utilized to assess individual experiences in graduate programs and asked participants to reflect on their time in graduate school. Cook-Sather (2002) discusses the importance of conducting interviews with students about the educational process and students' goals. Students are rarely afforded opportunities to openly share their experiences and it is these experiences that should inform educational practices. If students are able to discuss their experiences with a person in power (academically) it may provide a chance for them to be involved in dialogue that directly influences their education. Graduate students have unique experiences that may not be fully captured by survey responses alone and these experiences can help inform future interactions between graduate students and their mentors and identify opportunities for growth, achievement,

and resilience. The present interview used questions featuring non-inflammatory language as some students may have had experiences that are potentially sensitive to discuss with a stranger. Participants were interviewed by a fellow graduate student in an attempt to avoid potential power imbalances that could exist between the participants and non-graduate student members of the research team (faculty supervisor and undergraduate research assistants).

Measures and Materials

Participants who agree to be interviewed as a follow-up to the initial survey were invited to participate in the interview in a reserved room in the Behavioral Sciences Building at CSU or via Skype. Physical constraints, timing, personal comfort, and access can influence how participants prefer to be interviewed and thus they were given autonomy with this choice. All interviews were recorded using Audacity. Questions examine motivation, competence/skills, and relatedness in graduate students (e.g. what was the main motivating factor for pursuing a doctoral degree? What skills are most important to have as a graduate student?) The interview was semi-structured to avoid some variation and deviation in the data. A set list of questions was used with each interviewee, but sometimes additional probing questions were needed or the natural flow of conversation moved away from the set questions. This study seeks to improve understanding of graduate student experiences in specific domains (motivation) and thus the interview requires some focus. Participants are able to guide the direction of the interview somewhat (e.g. they may discuss an experience that is not directly related to the question, but provides new insight into different graduate student experiences) and thus some variance in responses is expected. Probing or guiding questions will be utilized as needed for clarification.

Procedure

Participants who were selected to participate in the interview were contacted via email to schedule an interview via Skype or in-person with the primary investigator. All participants provided informed consent and agreed to have the audio portion of the interview recorded. Each interview lasted approximately 30-45 minutes and contained a set list of questions, but the interview included flexibility in the event that additional points of conversation were addressed. Autonomy was assessed by asking participants to discuss why they decided to pursue graduate school. Competence was assessed by asking the participants to identify what skills they felt were necessary to be successful in graduate school in addition to if they possessed said skills. Relatedness was explored by asking participants to identify how they felt their program of study helped them feel connected to their peers as well as in personal relationships. At the end of the semi-structured interview, the participants were provided with an opportunity to share any additional thoughts about their experiences in graduate school. They were also provided with an opportunity to ask additional questions or discuss the research in more depth before being thanked and sent a \$25 Amazon e-gift card at the end of the interview (via e-mail).

The Institutional Review Board (IRB) of the host university approved the study procedures (see Appendix I for IRB approval letter).

Data Analysis

A theory-driven thematic analysis was used to assess common themes in the interviews. Theory-driven thematic analysis is commonly applied in qualitative research and it allows researchers to examine the data from a specific framework. The current study utilized Self-Determination Theory to examine the data with particular attention to various types of

motivation. Data were coded by a team of 4 trained research assistants and the principal investigator.

Each interview was initially transcribed using “Voice to Text” on Google Docs and any personally identifying information was removed from the transcripts. All transcripts were labeled with unique codes. Training for coding the interviews included the following steps. First, research assistants familiarized themselves with Self-Determination Theory by reading Deci and Ryan (2008) and the principal investigator developed a coding manual based upon this article. As a group, the research assistants and principal investigator discussed the different aspects of autonomy and potential examples for competence and relatedness. These constructs were utilized to explore different types of motivation that participants identified as influential factors. Trained members of the research team reviewed each transcript for accuracy and edited each transcript as needed (i.e., to fix spelling and audio errors). Research assistants then coded each interview in pairs to identify commonalities and assess the presence of autonomy, competence, and relatedness (Deci & Ryan, 2008). The Self-Determination Theory continuum (Figure 3) was used to categorize motivation first as either intrinsic, extrinsic, or autonomous. The interviews were then examined for themes of integrated regulation, regulation through identification, introjected regulation of behavior, externally regulated, controlled motivation or amotivation (Table 15). Initial interrater reliability varied across the different variables of interest from poor to moderate agreement ($\kappa = .028$ to $\kappa = .442$). Discrepant codes were reviewed until a consensus was reached and then the final code was updated to reflect the agreed-upon value. A copy of the coding manual is included (See Appendix H).

Table 15
Qualitative themes within Self-Determination Theory

Autonomy		
Type of Motivation	Type of Regulation	Themes
Intrinsic	Intrinsic regulation	Inherently satisfying Engage in the behavior because it brings joy
Extrinsic Autonomous	Integrated regulation	Goal is personally relevant and outcomes are personally important
	Identified regulation	Goal is important, but not part of the individual's values
	Controlled	
	Introjected regulation	Individual conforms to expected norms, but the norms are not personally valued
	External regulation	Task or goal is not personally relevant and individual only engages in task or goal completion when provided with rationale
Amotivation	Non-regulation	Lack of intention or general motivation
Competence		
Skills needed for success		
Relatedness		
Connection to others		

After the data were transcribed and then coded, the principal investigator interpreted the findings from an empirically informed background (i.e. identifying common themes from SDT) to address the research question.

Results

Twenty-one participants completed the interview (12 Natural Science students; 9 Liberal Arts students) and 81.0% of the sample identified as female (see Table 16 for additional demographics).

Table 16.
Demographics of the current sample by Affiliated College (N=21)

	Natural Sciences	Liberal Arts
Biological Sex - Female	9 (81.8%)	8 (80.8%)
Sexual Orientation - Heterosexual	8 (72.7%)	9 (90.0%)
Age – 25-34 years old	10 (90.9%)	5 (50.0%)
Race – White	11 (100%)	8 (80.0%)
Year in Program – 4 th	4 (36.4%)	2 (20.0%)

Participants were first asked to describe when they decided to pursue graduate school and what factors influenced the decision. 76.2% of all participants reported that their decision to pursue graduate school was autonomous in nature, there was no statistical relationship between affiliated program and autonomous motivation, $X^2(1) = .153, p = .696$. Equal numbers of participants reported intrinsic (62.1%) and extrinsic (62.1%) motivating factors as well, reflecting that the same behavior can be motivated by multiple factors. Upon closer inspection, the relationship between intrinsic motivation and affiliated program was significant; Natural Sciences students were significantly more likely to mention intrinsic motivation compared to Liberal Arts students, $X^2(1) = 3.884, p = .049$. The relationship between extrinsic motivation and affiliated program was not significant, $X^2(1) = 1.147, p = .284$. Some examples of statements made by the graduate students that were interviewed appear below:

“I was doing some research like volunteering doing some field work and I decided I still really like to research enough to continue doing it...I really like the actual process of doing science. I like being able to ask questions about the natural world and answer them. I had done some research during my undergraduate degree as well so I guess I was primed for a little bit more.”

-Natural Sciences Student

“I knew I needed a graduate degree to get the type of job I wanted, and I knew it would make me more competitive. I honestly didn’t want to go to school and was really intimidated by the process but all my professors that I talked to told me that a bachelor’s degree wouldn’t cut it and they were absolutely right.”

-Liberal Arts Student

“I actually liked working in the laboratory so that’s how I ended up having a natural sciences approach and that’s how I ended up deciding I want to do more research. So that’s how I ended up there.”

-Natural Sciences Student

Participants were also asked to identify skills important to graduate students. The following skills or qualities were the top 4 most mentioned by participants regardless of affiliated college: motivation (57.1%), time management (38.1%), the ability to accept failure (19.0%), and independence (14.3%). All skills mentioned are included in Table 17.

Table 17
Skills identified as important to graduate students

Skill	N(%)
Drive (motivation/persistence)	12 (57.1%)
Time management	8 (38.1%)
Accept failure/take constructive criticism/ be uncomfortable	4 (19.0%)
Independence	3 (14.3%)
Organization	2 (9.5%)
Self-advocacy	2 (9.5%)
Ask for help	2 (9.5%)
Accountability	1 (4.8%)
Professionalism	1 (4.8%)
Identify goals	1 (4.8%)
World-view	1 (4.8%)
Confidence	1 (4.8%)
Support network	1 (4.8%)
Creativity	1 (4.8%)
Patience	1 (4.8%)
Self-efficacy	1 (4.8%)
Self-reflection	1 (4.8%)
Stress management	1 (4.8%)

“I say self-motivation for sure...time management, persistence...it's just grit, right? You know you have to have some passion with a helping of persistence and grit. Organization as well, although I've met some disorganized people but I think it helps.”

-Natural Sciences student

“Time management, it's extremely important, and also the ability to take constructive criticism. It can be a little soul crushing at times so it is something you have to learn. You need to realize that you are gonna get criticized, and not be perfect right off the bat and that's okay. Those are probably the two biggest ones.”

-Liberal Arts student

Participants were asked to discuss how their respective programs help them feel connected to others in their programs as well as outside of the program; this question was included to assess relatedness. The relationship between college (Natural Sciences or Liberal Arts) and program relatedness ($M = 2.143$, $SD = .727$) was not significant, $X^2 (2) = .095$, $p=.953$; the relationship between college and lab relatedness ($M = 2.00$, $SD = .953$) was not significant, $X^2 (3) = 5.067$, $p=.167$; the relationship between college and other relatedness ($M = 1.857$, $SD = .727$) was not significant, $X^2 (2) = 1.499$, $p=.473$.

“[I’m] not very connected at all. A lot of the persons are older and then others are extremely young. I get on with them well, don't get me wrong, but I have no desire to hang out with them or do anything outside of school and when I go home from school, like I switch off as much as possible.”

-Liberal Arts student

“We try to do a lot of community things, doing dinner together, and in the spring all the women do a clothing swap, and we have a holiday party. So we try to do things like that, and be like “hey I’m going to a coffee shop to study if anyone wants to join” Facebook chat going on. I think anyone not in the Facebook chat feels a little bit more excluded, so we try to be mindful of that and include them anyway we can.”

-Liberal Arts student

“We have a very connected program, we’ve all known each other for multiple years, we've all been through the struggle...we still go out for drinks occasionally, we do department talks every year in the fall and so everybody listens to what everybody's doing for research. I can tell you every body’s name in the department and I can tell you everybody's research, basically, and I know every Professor in our department, not you know on an intimate basis, but I know them on a first name basis...Connecting with my peers on a social level is slightly difficult only because I was the only grad student coming in married and not necessarily right out of undergrad, but we can connect on a science level...I’m not necessarily close with my year anymore it's more the people that I see on a daily basis in lab, so I haven't bonded with my year as much as I’ve bonded with other people from different years and I've done things socially.”

-Natural Sciences student

At the end of each interview, participants were asked to share any other comments about their time as graduate students. 90.5% of the participants provided explicit statements about being happy with their graduate experience, but 68.4% of those students also expressed concerns related to the following issues: lack of diversity, one or more other graduate students’ well-being, lack of resources for graduate students. The most common comments are included in Table 18.

Table 18

Number of participants who made unsolicited comments about the following topics

Topic	N(% of total)
Happy with grad experience	19 (90.5%)
Concerned about someone else in the program	5 (23.8%)
Has felt depressed	2 (9.5%)
Has sought out mental health treatment	2 (9.5%)
Concerns about lack of diversity	5 (23.8%)
Would like additional resources	6 (28.6%)

Discussion

Semi-structured interviews were conducted to explore common experiences for graduate students while also examining motivation according to SDT. Most participants chose to pursue their graduate degrees because they are passionate about their areas of study and want the ability to conduct and develop projects of their own; few participants mentioned pursuing their degrees because it was expected or required of them. Students in the College of Natural Sciences were more likely to report intrinsic motivators than Liberal Arts students, but regardless of programs most participants reported that the decision to pursue a doctoral degree was made autonomously.

When asked which skills were important for graduate school, participants often described qualities and character traits (e.g. determined, manages time well, able to accept constructive criticism) rather than specific skills pertinent to many higher educational programs (e.g. ability to conduct analyses, write academic papers, and teach effectively). Several qualities mentioned also align with resilience (e.g. able to overcome failure, keep going, stay motivated), a quality common in many graduate students. Many students said that skill attainment in graduate school is an ongoing process. Some skills, like being able to write academic papers and present at conferences, were skills that students felt they possessed and were refining in graduate school, and others, like time management and accepting criticism, are still being developed. Graduate school can be a place for growth as well as achievement when the conditions agree.

The interview findings suggest some inconsistency about the importance of relatedness when pursuing a doctoral degree. Deci and Ryan (2000) describe relatedness as the degree to which an activity connects people; they have demonstrated a positive association between relatedness and overall intention and motivation; greater relatedness is associated with greater intention and motivation. The graduate students in this study appeared to have various types of

relationships with other students (e.g., friendships, romantic relationships) in and outside of their respective programs and the relatedness they experience in each type of environment/relationship varied. Students who said they were not connected with their academic peers said that it was intentional; they do not wish to have relationships with fellow graduate students outside of school because they need separation between work and life. Other students reported feeling very connected with their classmates (e.g. routinely have meals and social events together outside of academia) and that those relationships were often supportive because peers understand the unique challenges of graduate school.

While some students reported very strong relationships outside of school (e.g. partners, family members, friends from “before”) others discussed the isolating aspects of graduate programs (i.e. it has become hard to relate to people outside of graduate school). The level of relatedness also appeared to change over time; perhaps counterintuitively, students who had been in their programs longer reported *less* connectedness and relatedness with their peers compared to students who were just beginning the program. There are several possible reasons for this inverse relationship between time in program and relatedness: people may have lost touch with their cohorts over time because they have less time for socializing as school responsibilities increase, or there could be cohort attrition over time (i.e. people cannot maintain academic relationships with people who are no longer in the program/academia).

Implications

Self-Determination Theory is useful in describing the motivation of the current graduate student sample, especially when examining autonomous and controlled motivation (Deci & Ryan, 2008). Many participants said that they *chose* to pursue a doctoral degree; choice in this context demonstrates autonomous motivation which is often intrinsically based. This implies that

graduate students are yet again a unique population; they are motivated to engage in an arduous task for a long period of time because it is personally rewarding to them.

Limitations

Certain limitations are inherent in exploratory studies; causal conclusions cannot be made from these data and interpretations are sometimes more subjective than preferable. Despite the protocol in place for coding interview responses, there were still occasional disagreements between raters that needed to be resolved. Bias is always an issue of concern when conducting qualitative research because responses are subject to interpretation. The primary investigator acknowledges that her own bias may have been introduced during this study (she was a graduate student at the university while data collection occurred) because her own personal experiences in the graduate program differed in many ways from most participants' experiences. Having undergraduate research assistants was helpful to expedite the coding process, but undergraduates are limited by their experience and thus present another potential source of bias. The research assistants were also students at the university where data collection occurred so they may have had preconceived notions about the environment of certain colleges or departments.

Conducting interviews in person ($n = 9$) compared to electronically ($n = 12$) may have influenced the participant's level of comfort and thus disclosure. While most participants reported feeling comfortable during the interview process, two students were clearly uncomfortable with the process (they were reminded several times that they could stop participating without penalty, both chose to complete the interview). Electronic interviews may help reduce some of that discomfort, especially if the option to turn off a video recording is provided.

Future Studies

Several participants indicated that they were not aware of research opportunities or other outlets for graduate students to share their experiences; many expressed gratitude and excitement at an opportunity to openly reflect upon their graduate experience, especially if doing so provides insight for future research and program recommendations. Additional research should be conducted to further assess the individual nuances of the graduate experience, such as common experiences and expectations with other members in academia, namely advisors. Students also expressed concern over the lack of diversity and resources for graduate students. Additional research could explore international student and other minority student experiences in more depth to identify unique needs and experiences. Future studies could also identify which resources graduate students would find beneficial and if those resources are actually useful.

Graduate school is a unique experience and those who undergo it report feeling empowered, stressed, tired, excited, passionate, defeated, and dedicated; for some these feelings are not isolated, they can occur in unison. When asked about the graduate experience, one participant responded:

“I’ve learned a lot and grown so I’m grateful for my time here...I know graduate school is supposed to be hard and challenging, but does it need to be traumatic too?”

-Natural Sciences Student

Studies such as these should be used to inform programs and departments so that the graduate experience prioritizes growth, scholarship, integrity and well-being.

REFERENCES

- Abraham, R.R., Hande, V., Sharma, M.J., Wohlrath, S.K., Keet, C., & Ravi, S. (2014) Use of humour in classroom teaching: students' perspectives. *Thrita*, 3(2).
<http://dx.doi.org/10.5812/thrita.10517>
- Ajzen I. (1985) From intentions to actions: A theory of planned behavior. In: Kuhl J., Beckmann J. (eds) *Action Control. SSSP Springer Series in Social Psychology*. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-69746-3_2
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Alt, D., & Itzkovich, Y. (2015). Assessing the connection between students' justice experience and perceptions of faculty incivility in higher education. *Journal of Academic Ethics*, 13(2), 121-134. DOI 10.1007/s10805-015-9232-8
- Anderson, M. S., & Louis, K. S. (1994). The graduate students experience and subscription to the norms of science. *Research in Higher Education*, 35(3), 273-299.
<https://doi.org/10.1007/BF02496825>
- Anderson, M. S., Louis, K. S., & Earle, J. (1994). Disciplinary and departmental effects on observations of faculty and graduate student misconduct. *The Journal of Higher Education*, 65(3), 331-350.
- Antonovsky, A. (1987). *The Jossey-Bass social and behavioral science series and the Jossey-Bass health series. Unraveling the mystery of health: How people manage stress and stay well*. San Francisco, CA, US: Jossey-Bass.

- Asch, S. E., & Guetzkow, H. (1951). Effects of group pressure upon the modification and distortion of judgments. *Groups, leadership, and men*, 177-190.
- Austin, A. E. (2002). Preparing the next generation of faculty: Graduate school as socialization to the academic career. *The Journal of Higher Education*, 73(1), 94-122. doi: 10.1353/jhe.2002.0001
- Bain, S., Fedynich, L., & Knight, M. (2011). The successful graduate student: A review of the factors for success. *Journal of Academic and Business Ethics*, 3, 1-9.
- Baker, M., Frazier, P., Greer, C., Paulsen, J., Howard, K., & Meredith, L. et al. (2016). Sexual victimization history predicts academic performance in college women. *Journal of Counseling Psychology*, 63(6), 685-692. <http://dx.doi.org/10.1037/cou0000146>
- Baron, R. M., & Kenny D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182. <http://dx.doi.org/10.1037/0022-3514.51.6.1173>
- Berg, H., & Ferber, M. (1983). Men and women graduate students: who succeeds and why? *The Journal of Higher Education*, 54(6), 629-648. <http://dx.doi.org/10.1080/00221546.1983.11780187>
- Berger, J. (2007, October). Exploring ways to shorten the ascent to a Ph.D. *New York Times*, 3, www.nytimes.com/2007/10/03/education/03education.html.
- Blair-Loy, M. (2001). Cultural constructions of family schemas: The case of women finance executives. *Gender & Society*, 15(5), 687-709. DOI: [10.1177/089124301015005004](https://doi.org/10.1177/089124301015005004)

- Bonanno, G. A. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist*, 59(1), 20-28.
doi: 10.1037/0003-066X.59.1.20
- Botvin, G. J., & Griffith, K. W. (2004). Life skills training: Empirical findings and future directions. *Journal of Primary Prevention*, 25(2), 211-232.
<http://dx.doi.org/10.1023/B:JOPP.0000042391.58573.5b>
- Bowles, S. V., & Bates, M. J. (2010). Military organizations and programs contributing to resilience building [Editorial]. *Military Medicine*, 175(6), 382–385.
- Bundy-Fazioli, K., Quijano L., Bubar, R. (2011). Graduate Students' perceptions of professional power in social work practice. *Journal of Social Work Education*, 49, 108-121. doi: 10.1080/10437797.2013.755092
- Cannon, W. (1932). *Wisdom of the Body*. United States: W.W. Norton & Company. ISBN 0393002055
- Castleberry, A., & Nolen, A. (2018). Thematic analysis of qualitative research data: Is it as easy as it sounds?. *Currents in Pharmacy Teaching and Learning*, 10(6), 807-815.
<https://doi.org/10.1016/j.cptl.2018.03.019>
- Castro, F. G., & Murray, K. E. (2010). Cultural adaptation and resilience: Controversies, issues, and emerging models. In J. W. Reich, A. J. Zaurtra, & J. S. Hall (Eds.), *Handbook of adult resilience*, 375-403.
- Chan, Z., Tong, C., & Henderson, S. (2017a). Power dynamics in the student-teacher relationship in clinical settings. *Nurse Education Today*, 49(4), 174-179.
<http://dx.doi.org/10.1016/j.nedt.2016.11.026>

- Chan, Z., Tong, C., & Henderson, S. (2017b). Uncovering nursing students' views of their relationship with educators in a university context: A descriptive qualitative study. *Nurse Education Today*, 49(2017), 110-114. <http://dx.doi.org/10.1016/j.nedt.2016.11.020>
- Cohen, F. (1984). "Coping" In J.D. Matarazzo, S.M. Weiss, J.A. Herd, N.E. Miller & S.M. Weiss (eds.), *Behavioral Health: A Handbook of Health Enhancement and Disease Prevention*. New York: Wiley, 1984.
- Cohen, S., & McKay, G. (1984). Social support, stress and the buffering hypothesis: A theoretical analysis. *Handbook of psychology and health*, 4, 253-267.
- Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. In M. R. Gunnar & L. A. Sroufe (Eds.), *Self Processes and development*, 43-77.
- Cook-Sather, A. (2002). Authorizing students' perspectives: Toward trust, dialogue, and change in education. *Educational Researcher*, 31(4), 3-14.
<http://dx.doi.org/10.3102/0013189x031004003>
- Council of Graduate Schools (CGS). (2004). Ph.D. completion and attrition: Policy, numbers, leadership, and next steps. *The Council of Graduate Schools*, Washington, D.C.
- Council of Graduate Schools (CGS). (2006). Ph.D. completion and attrition: Analysis of baseline program data from the Ph.D Completion Project. *The Council of Graduate Schools*, Washington, D.C.
- Cullum-Swan, B. E. T. S., & Manning, P. (1994). Narrative, content, and semiotic analysis. *Handbook of qualitative research*, 463-477.

- Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian psychology/Psychologie canadienne*, 49(3), 182-185. doi: 10.1037/a0012801
- Descutner, C. J., & Thelen, M. H. (1989). Graduate student and faculty perspectives about graduate school. *Teaching Of Psychology*, 16(2), 58-61. doi: 10.1207/s15328023top1602_2
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *The Journal of Abnormal and Social Psychology*, 51(3), 629-636. <http://dx.doi.org/10.1037/h0046408>
- Elliot, A., J., Aldhobaiban, N., Kobeisy, A., Murayama, K., Gocłowska, M. A., Lichtenfeld, S. and Khayat, A. (2016) Linking social interdependence preferences to achievement goal adoption. *Learning and Individual Differences*, 50, 291-295. ISSN 1041-6080 doi: <https://doi.org/10.1016/j.lindif.2016.08.020>
- Emmons, R. A. (1991). Personal strivings, daily life events, and psychological and physical well-being. *Journal of personality*, 59(3), 453-472. <https://doi.org/10.1111/j.1467-6494.1991.tb00256.x>
- Emmons, R. A. (1992). Abstract versus concrete goals: personal striving level, physical illness, and psychological well-being. *Journal of personality and social psychology*, 62(2), 292. DOI: 10.1037/0022-3514.62.2.292
- Evans, P. (2015). Self-determination theory: An approach to motivation in music education. *Musicae Scientiae*, 19(1), 65-83. <https://doi.org/10.1177/1029864914568044>
- Fisher, W. A., Fisher, J.D., & Harman, J. (2003). The information-motivation-behavioral skills model: A general social psychological approach to understanding and promoting health

- behavior. In J. Suls & K. A. Wallston (Eds.), *Blackwell series in health psychology and behavioral medicine. Social psychological foundations of health and illness* (pp. 82-106). Malden, : Blackwell Publishing. <http://dx.doi.org/10.1002/9780470753552.ch4>
- Florida, R. (2006). The flight of the creative class: The new global competition for talent. *Liberal Education*, 92(3), 22-29.
- Foucault, M. (1977). *Discipline and Punish: The Birth of the Prison*. Trans. Alan Sheridan. New York: Pantheon.
- French, J. R. P., & Raven, B. H. (1968). Group dynamics: Research and theory, chapter bases of social power.
- French, J. R., Raven, B., & Cartwright, D. (1959). The bases of social power. *Classics of organization theory*, 7, 311-320.
- Freyd, J. (1997). II. Violations of power, adaptive blindness and betrayal trauma theory. *Feminism and Psychology*, 7(1), 22-32. <http://dx.doi.org/10.1177/0959353597071004>
- Frymier, B. A., Shulman, M. G., & Houser, L. M. (1996). The development of a learner empowerment measure. *Communication Education*, 45(3), 181-199. doi: 10.1080/03634529609379048
- García, F.E., Barraza-Peña, C.G., Wlodarczyk, A., Alvear-Carrasco, & Reyes-Reyes, Al. (2018). Psychometric properties of the Brief-COPE for the evaluation of coping strategies in the Chilean population. *Psicologia: Reflexao e Critica*, 31(22). <https://doi.org/10.1186/s41155-018-0102-3>
- Gardner, S. K., & Barnes, B. J. (2007). Graduate student involvement: Socialization for the professional role. *Journal of College Student Development*, 48(4), 369-387. <https://doi.org/10.1353/csd.2007.0036>

- Garnezy, N. (1993). Vulnerability and resilience. In D. C. Funder, R. D. Parke, C. Tomlinson-Keasey, & K. Widaman (Eds.), *Studying lives through time: Personality and development*. (pp. 377-397). Washington, DC: American Psychological Association.
<https://doi.org/10.1037/10127-032>
- Gibson, C., Medeiros, K. E., Giorgini, V., Mecca, J. T., Devenport, L. D., Connelly, S., & Mumford, M. D. (2014). A qualitative analysis of power differentials in ethical situations in academia. *Ethics & behavior*, 24(4), 311-325. DOI:10.1080/10508422.2013.858605
- Girves, J., & Wemmerus, V. (1988). Developing models of graduate student degree progress. *The Journal of Higher Education*, 59(2), 163-189.
<http://dx.doi.org/10.1080/00221546.11778320>
- Golde, C. M. (2005). The role of the department and discipline in doctoral student attrition: Lessons from four departments. *The Journal of Higher Education*, 76(6), 669-700.
doi.org/10.1080/00221546.2005.11772304
- Goplerud, E. N. (2001). Stress and stress mastery in graduate school. In S. Walfish & A. K. Hess (Eds.), *Succeeding in graduate school: The career guide for psychology students* (p. 129–140). Lawrence Erlbaum Associates Publishers.
- Griffith, J., & West, C. (2013). Master resilience training and its relationship to individual well-being and stress buffering among Army National Guard soldiers. *The journal of behavioral health services & research*, 40(2), 140-155. DOI: 10.1007/s11414-013-9320-8
- Hawkins, R., Manzi, M. & Ojeda, D. (2014). Lives in the making: Power, academia and the everyday. *International E-Journal for Critical Geographies*, 13(2), 328-351.
<https://www.acme-journal.org/index.php/acme/article/view/1010>.

- Heins, M., Fahey, S. N., & Leiden, L. I. (1984). Perceived stress in medical, law, and graduate students. *Journal of Medical Education*. 169-179
- Heintzelman, S. J., & King, L. A. (2014). Life is pretty meaningful. *American Psychologist*, 69(6), 561-574. <http://dx.doi.org/10.1037/a0035049>
- Helpman, L., Penso, J., Zagoory-Sharon, O., Feldman, R., & Gilboa-Schechtman, E. (2017). Endocrine and emotional response to exclusion among women and men; cortisol, salivary alpha amylase, and mood. *Anxiety, Stress, & Coping*, 30(3), 253-263. doi: [10.1080/10615806.2016.1269323](https://doi.org/10.1080/10615806.2016.1269323)
- Hoffmann, F. (1986). Sexual harassment in academia: Feminist theory and institutional practice. *Harvard Educational Review*, 56(2), 105-122. <https://doi.org/10.17763/haer.56.2.y11m78k58t4052x2>
- Holmes, T. H., & Rahe, R. H. (1967). Schedule of recent experience. *Marriage*, 10, 50.
- Holmes, J. G. (2002). Interpersonal expectations as the building blocks of social cognition: An interdependence theory perspective. *Personal Relationships*, 9(1), 1-26. DOI: [10.1111/1475-6811.00001](https://doi.org/10.1111/1475-6811.00001)
- Hyun, J. K., Quinn, B. C., Madon, T., & Lustig, S. (2006). Graduate student mental health: Needs assessment and utilization of counseling services. *Journal of College Student Development*, 47(3), 247-266. <https://doi.org/10.1353/csd.2006.0030>
- Itzkovich, Y., & Alt, D. (2015). Development and validation of a measurement to assess college students' reactions to faculty incivility. *Ethics & Behavior*, 26(8), 621-637. <http://dx.doi.org/10.1080/10508422.2015.1108196>

- Itzkovich, Y., & Dolev, N. (2016). The relationships between emotional intelligence and perceptions of faculty incivility in higher education. Do men and women differ?. *Current Psychology*, 36(4), 905-918. <http://dx.doi.org/10.1007/s12144-016-9479-2>
- Jain, A., Petty, E., Jaber, R., Tackett, S., Purkiss, J., Fitzgerald, J., & White, C. (2014). What is appropriate to post on social media? Ratings from students, faculty members and the public. *Medical Education*, 48(2), 157-169. <http://dx.doi.org/10.1111/medu.12282>
- Jang, H. (2008). Supporting students' motivation, engagement, and learning during an uninteresting activity. *Journal of Educational Psychology*, 100(4), 798-811. doi: 10.1037/a0012841
- Johnson, D. (2003). Social interdependence: Interrelationships among theory, research, and practice. *American Psychologist*, 58(11), 934-945. <http://dx.doi.org/10.1037/0003-066x.58.11.934>
- Johnson, D. W., & Johnson, R. T. (2002). Cooperative learning and social interdependence theory. In *Theory and research on small groups* (pp. 9-35). Springer, Boston, MA.
- Johnson, D.W., & Johnson, R.T. (2005). New developments in social interdependence theory. *Genetic, Social, and General Psychology Monographs*, 131(4), 285-358. <https://doi.org/10.3200/MONO.131.4.285-358>
- Johnson, D., & Johnson, R. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher*, 38(5), 365-379. <http://dx.doi.org/10.3102/0013189x09339057>
- Kanner, A.D., Coyne, J.C., Schaefer, C. & Lazarus, R.S. (1981). Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. *Journal of Behavioral Medicine*, 4(1), 1-39. <https://doi.org/10.1007/BF00844845>

- Komaraju, M., Musulkin, S., & Bhattacharya, G. (2010). Role of student-faculty interaction in developing college students' academic self-concept, motivation, and achievement. *Journal of College Student Development, 51*(3), 332-342.
<http://dx.doi.org/10.1353/csd.0.0137>
- Kumpfer, K.L. (1999). Factors and process contributing to resilience: the resilience framework. *In: Glantz M.D., Johnson J.L. (eds) Resilience and Development. Longitudinal Research in the Social and Behavioral Sciences: An Interdisciplinary Series*, 179-224.
https://doi.org/10.1007/0-306-47167-1_9
- Lamm, H., & Myers, D.G. (1978). Group-induced polarization of attitudes and behavior. *Advances in Experimental Social Psychology, 11*, 145-195.
[https://doi.org/10.1016/S0065-2601\(08\)60007-6](https://doi.org/10.1016/S0065-2601(08)60007-6)
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York, NY, US: McGraw-Hill.
- Lazarus R.S., & Cohen J.B. (1977) Environmental Stress. In: Altman I., Wohlwill J.F. (eds) *Human Behavior and Environment*. Springer, Boston, MA. https://doi.org/10.1007/978-1-4684-0808-9_3
- Lazarus, R., & Folkman, S. (1984). *Stress appraisal and coping*. New York: Springer
- Ledesma, J. (2014). Conceptual frameworks and research models on resilience in leadership. *Sage Open, 4*(3), 1-8. <https://doi.org/10.1177/2158244014545464>
- Li, C. T., Cao, J., & Li, T. M. (2016, September). Eustress or distress: An empirical study of perceived stress in everyday college life. In *Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct* (pp. 1209-1217). ACM.

- Lovitts, B. E., & Nelson, C. (2000). The hidden crisis in graduate education: Attrition from Ph.D. programs. *Academe*, 86(6), 44-50.
- Lunenburg, F. (2012). Power and leadership: an influence process. *International Journal of Management, Business, and Administration*, 15(1), 1-9.
- Maddi, S.R. (2002) The story of hardiness: Twenty years of theorizing, research, and practice. *Consulting Psychology Journal*, 54, 175-185. <http://dx.doi.org/10.1037/1061-4087.54.3.173>
- Markus, H.R. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology*, 35, 63-78. <http://dx.doi.org/10.1037/0022-3514.35.2.63>
- Martin, A.J. (2006). The relationship between teachers' perceptions of student motivation and engagement and teachers' enjoyment of and confidence in teaching. *Asia-Pacific Journal of Teacher Education*, 34(1), 73-93. DOI: [10.1080/13598660500480100](https://doi.org/10.1080/13598660500480100)
- McEwen, B. S. (2007). Physiology and neurobiology of stress and adaptation: central role of the brain. *Physiological reviews*, 87(3), 873-904. doi.org/10.1152/physrev.00041.2006
- Meredith, L. S., Sherbourne, C. D., Gailliot, S. J., Hansell, L., Ritschard, H. V., Parker, A. M., & Wrenn, G. (2011). Promoting psychological resilience in the US military. *Rand health quarterly*, 1(2). Retrieved from <https://apps.dtic.mil/dtic/tr/fulltext/u2/a545224.pdf>
- Merton, R.K. (1942). *The Normative Structure of Science*.
- Mitroff, I. I. (1974). Norms and counter-norms in a select group of the Apollo moon scientists: A case study of the ambivalence of scientists. *American Sociological Review*, 579-595. DOI: 10.2307/2094423

- Myers, D. G., & Lamm, H. (1975). The polarizing effect of group discussion: The discovery that discussion tends to enhance the average prediscussion tendency has stimulated new insights about the nature of group influence. *American Scientist*, 63(3), 297-303.
- Myers, D. G., & Lamm, H. (1976). The group polarization phenomenon. *Psychological bulletin*, 83(4), 602-627. <http://dx.doi.org/10.1037/0033-2909.83.4.602>
- Park, C. L., & Ai, A.L. (2006). Meaning making and growth: New directions for research on survivors of trauma. *Journal of Loss & Trauma*, 11, 389-407.
<https://doi.org/10.1080/15325020600685295>
- Prislin, R., & Wood, W. (2005). Social influence in attitude change. In: D. Albarracin, B.T. Johnson, & M.P. Zanna (Eds), *The Handbook of Attitudes*, 671-706.
- Raisman, N. (2013). The cost of college attrition at four-year colleges & universities: An analysis of 1669 US Institutions. *Policy perspectives*.
- Rakes, G. C., & Dunn, K. E. (2010). The Impact of Online Graduate Students' Motivation and Self-Regulation on Academic Procrastination. *Journal of Interactive Online Learning*, 9(1).
- Raven, B.H. (1993). The bases of power: Origins and recent developments. *Journal of Social Issues*, 49(4), 227-251. <https://doi.org/10.1111/j.1540-4560.1993.tb01191.x>
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne Social Desirability Scale. *Journal of clinical psychology*, 38(1), 119-125.
[http://dx.doi.org.ezproxy2.library.colostate.edu/10.1002/1097-4679\(198201\)38:1<119::AID-JCLP2270380118>3.0.CO;2-I](http://dx.doi.org.ezproxy2.library.colostate.edu/10.1002/1097-4679(198201)38:1<119::AID-JCLP2270380118>3.0.CO;2-I)

- Rocha-Singh, I. A. (1994). Perceived stress among graduate students: Development and validation of the graduate stress inventory. *Educational and Psychological Measurement*, 54(3), 714-727. <https://doi.org/10.1177/0013164494054003018>
- Rosenthal, M., Smidt, A., & Freyd, J. (2016). Still second class: Sexual harassment of graduate students. *Psychology of Women Quarterly*, 40(3), 364-377.
<http://dx.doi.org/10.1177/0361684316644838>
- Rutter, M. (1985). Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. *British Journal of Psychiatry*, 147, 598-611.
<https://doi.org/10.1192/bjp.147.6.598>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.
<http://dx.doi.org/10.1037/0003-066X.55.1.68>
- Ryan, R.M., Williams, G.C., Patrick, H., & Deci, E.L. (2009). Self-determination theory and physical activity: The dynamics of motivation in development and wellness. *Hellenic Journal of Psychology*, 6, 107-124.
- Rydell, R. J., McConnell, A. R., & Beilock, S. L. (2009). Multiple social identities and stereotype threat: Imbalance, accessibility, and working memory. *Journal of personality and social psychology*, 96(5), 949-966. DOI: 10.1037/a0014846
- Sapolsky, R. M. (2004). *Why zebras don't get ulcers: The acclaimed guide to stress, stress-related diseases, and coping-now revised and updated*. Holt paperbacks.
- Saunders, R. P., & Balinsky, S. E. (1993). Assessing the cognitive stress of graduate students. *Measurement and Evaluation in Counseling and Development*. 26(3), 192-203.

- Schubert, C., Lambertz, M., Nelesen, R. A., Bardwell, W., Choi, J. B., & Dimsdale, J. E. (2009). Effects of stress on heart rate complexity—a comparison between short-term and chronic stress. *Biological psychology*, 80(3), 325-332.
<https://doi.org/10.1016/j.biopsycho.2008.11.005>
- Schuler, R. S. (1982). An integrative transactional process model of stress in organizations. *Journal of Organizational Behavior*, 3(1), 5-19.
- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological science*, 18(5), 429-434. <https://doi.org/10.1111/j.1467-9280.2007.01917.x>
- Science of Behavior Change (SOBC). (2018, October). The measures: Brief-COPE.
<https://scienceofbehaviorchange.org/measures/brief-cope/>
- Seyle, H. (1956). *The stress of life*. New York: McGraw-Hill.
- Sezgin, F., & Erdogan, O. (2015). Academic optimism, hope and zest for work as predictors of teacher self-efficacy and perceived success. *Environmental Sciences: Theory & Practice*, 15(1), 7-19. <http://dx.doi.org/10.12738/estp.2015.1.2338>.
- Shanafelt, T. D., Boone, S., Tan, L., Dyrbye, L. N., Sotile, W., Satele, D., ... & Oreskovich, M. R. (2012). Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Archives of internal medicine*, 172(18), 1377-1385.
doi:10.1001/archinternmed.2012.3199
- Sidky, G. (2017). The power game: Power dynamics between the teacher and the student in the graduate seminar. *English Language Teaching*, 10(5), 179-192.
<http://doi.org/10.5539/elt.v10n5p179>

- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin*, 129, 216-269. doi:10.1037/0033-2909.129.2.216
- Søndergaard, D. (2001). Consensual and disensual university cultures: Gender and power in academia. *Nora: Nordic Journal of Women's Studies*, 9(3), 143-153.
<http://dx.doi.org/10.1080/08038740127802>
- Sullivan, G. M., & Feinn, R. (2012). Using effect size—or why the P value is not enough. *Journal of graduate medical education*, 4(3), 279-282. doi.org/10.4300/JGME-D-12-00156.1
- Taylor, S. E., & Armor, D.A. (1996). Positive illusions and coping with adversity. *Journal of Personality*, 64, 873-898. <https://doi.org/10.1111/j.1467-6494.1996.tb00947.x>
- Torok, S., McMorris, R., & Lin, W. (2004). Is humor a teaching tool? Perceptions of professors' teaching styles and use of humor. *College Teaching*, 52(1), 14-20.
<http://dx.doi.org/10.3200/ctch.52.1.14-20>
- Ülkü-Steiner, B., Kurtz-Costes, B., & Kinlaw, C. R. (2000). Doctoral student experiences in gender-balanced and male-dominated graduate programs. *Journal of Educational Psychology*, 92(2), 296-307. <https://doi.org/10.1037/0022-0663.92.2.296>
- Van de Mortel, T. F. (2008). Faking it: social desirability response bias in self-report research. *Australian Journal of Advanced Nursing*, 25(4), 40-48.
- Wagnild, G. M. (2016). The resilience scale user's guide for the US English version of the resilience scale (RS-14). *Worden, MT: The Resilience Center*.
- Walfish, S., & Hess, A.K.(Eds.). (2001).Succeeding in graduate school: The career guide forpsychology students. Mahwah, NJ: Lawrence Erlbaum Associates.

Wilson, R. L., & Hardgrave, B. C. (1995). Predicting graduate student success in an MBA program: Regression versus classification. *Educational and Psychological Measurement*, 55(2), 186-195.

APPENDICES

Appendix A: Personal Strivings Coding

(Emmons, 1991; Wigfield & Cambria, 2010)

Step #1: Identify how many personal strivings are listed (most will be 5 because that's what participants were asked to do, but not everyone did that). If there is NO response enter a (.) for missing data. If the participant says "I don't know" or something similar, mark it 0.

Step #2: Highlight when comments pertain to the following topics...

Publishing

Happiness/Enjoyment (do not include work-life balance comments)

Thesis/Dissertation

Teaching

*If you can't get individual parts of text to be highlighted, you can change the font color. I had to download the spreadsheet because I couldn't figure this out in Google Sheets.

Step #3: Code each personal striving according to the following categories. The number in front of each category represents its corresponding code.

1. *Achievement* - relevant to performance on tasks in which there are criteria to judge success or failure. Competence is a part of ability to achieve goal (can we clearly judge person did or did not accomplish task?).
Examples of these kinds of tasks are school activities, work activities, and competitive sport activities.
*teaching (general comment), getting a job, responses related to money, publications, solving a problem
- 2) *Intimacy*- has an element of closeness and sharing ("being" oriented)
*I included comments related to "being a good mentor"
Qualities of intimacy: a) commitment and concern for another person
b) interpersonal relationships involve positive affect/emotionality
c) concern with experiencing a warm, close, communicative exchange with others
d) helping others (reciprocity with communication and sharing)
e) emphasis on enjoying others company
f) focus on quality rather than quantity of relationships
- 3) *Affiliation*- rooted in fear of being rejected ("doing" oriented)
Qualities of affiliation: a) concern for or desire to establish, maintain, repair relationships
b) concern with seeking approval and attention from others
c) make efforts to win friends
d) concern with avoiding loneliness and rejection
- 4) *Power*
Qualities of power: a) concern about establishing, maintaining, restoring power
b) concern with having impact, control, or influence

- c) seeking fame or public recognition
- d) comparison/competition with others
- e) dominating, persuading, convincing others
- f) arousing emotions in others (making people happy or angry)
- *teaching could fall under this category if these components are included in the teaching experience description

5) *Other*

Comments related to the following or other random topics that don't fit the above categories.

Happiness, enjoyment from one's job

Work-life balance

Share knowledge

Open-ended Question

What would you like us to know about your CSU experience?

All codes will be assigned either a 0 or 1 in all cells.

First, assign a general code for general sense of positive or negative feedback. If the response has an overall tone of positivity or has more positive comments than negative comments, put a 1 in the corresponding cell. If the response has an overall tone of negativity or there are more negative comments than positive comments, the score for OverallNeg will be one. If no comments were provided, enter a 0 in both cells.

Positive comment categories: identify whether or not each type of comment was mentioned. If yes, enter a 1. If no, enter a 0.

PosAcquireSkills - acquired useful skills, teaching

PosLearning - learned from coursework, classes were helpful

PosFunding - positive comments about the stipend or funding

PosHealthIns - positive comments about health insurance provided

PosGrowth - experience has provided opportunities for growth and learning from mistakes

PosInterpersonRel - positive comments related to others who are NOT the advisor

PosAdvisorRel - positive comments related to the ADVISOR

PosSupport/Resources - sufficient resources and support provided (e.g. teaching materials, aid from faculty)

Negative comment categories: identify whether or not each type of comment was mentioned. If yes, enter a 1. If no, enter a 0

NegTimeInvest - amount of time required to complete degree, want to quit but have invested too much

NegStress - comments related to stress

NegImposterSyn - feeling inadequate, unable to be accepted by colleagues and peers as an equal academically

NegOverwork - comments related to overworking and lacking work/life balance

NegNoResources/Support - resources and/or support are lacking or insufficient

NegNoGrowth - no room for error or growth, attitudes endorsing perfectionism

NegAdvisorRel - negative comments related specifically to the ADVISOR

NegInterpersonalRel - negative comments related to interpersonal relationships within the program

NegCoursework - coursework or assigned tasks are irrelevant, seem useless

NegFinancial - comments mentioning financial struggles, lack of sufficient funding or insurance

Appendix B: Ideal Mentor Scale (IMS)

Answer each item by circling a number 1-5 according to the following importance rating:

Not at all important		Moderately Important		Extremely Important
1	2	3	4	5

Right now, at this stage of my program, my ideal mentor would ...

1. ... show me how to employ relevant research techniques.
2. ... give me specific assignments related to my research problem.
3. ... give proper credit to graduate students.
4. ... take me out for dinner and/or drink after work.
5. ... prefer to cooperate with others than compete with them.
6. ... help me to maintain a clear focus on my research objects.
7. ... respect the intellectual property rights of others.
8. ... be a role model.
9. ... brainstorm solutions to a problem concerning my research project.
10. ... be calm and collected in times of stress.
11. ... be interested in speculating on the nature of the universe or the human condition.
12. ... treat me as an adult who has a right to be involved in decisions that affect me.
13. ... help me plan the outline for a presentation of my research.
14. ... inspire me by his or her example and words.
15. ... rarely feel fearful or anxious.
16. ... help me investigate a problem I am having with research design.
17. ... accept me as a junior colleague.
18. ... be seldom sad or depressed.
19. ... advocate for my needs and interests.
20. ... talk to me about his or her personal problems.
21. ... generally try to be thoughtful and considerate.
22. ... be a cheerful, high-spirited person.
23. ... value me as a person.
25. ... have coffee or lunch with me on occasion.
26. ... keep his or her workspace neat and clean.
27. ... meet with me on a regular basis.
28. ... relate to me as if he/she is a responsible, admirable older sibling.
29. ... recognize my potential.
30. ... help me to realize my life vision.
31. ... help me plan a timetable for my research.
32. ... work hard to accomplish his/her goals.
33. ... provide information to help me understand the subject matter I am researching

Appendix C: Actual Mentor Scale

Answer each item by circling a number 1-5 according to how accurately each statement describes your current mentor.

Not at all important		Moderately Important		Extremely Important
1	2	3	4	5

Right now, at this stage of my program, my **mentor** ...

1. ... shows me how to employ relevant research techniques.
2. ... gives me specific assignments related to my research problem.
3. ... gives proper credit to graduate students.
4. ... takes me out for dinner and/or drink after work.
5. ... prefers to cooperate with others than compete with them.
6. ... helps me to maintain a clear focus on my research objects.
7. ... respects the intellectual property rights of others.
8. ... is a role model.
9. ... brainstorms solutions to a problem concerning my research project.
10. ... is calm and collected in times of stress.
11. ... is interested in speculating on the nature of the universe or the human condition.
12. ... treats me as an adult who has a right to be involved in decisions that affect me.
13. ... helps me plan the outline for a presentation of my research.
14. ... inspires me by his or her example and words.
15. ... rarely feels fearful or anxious.
16. ... helps me investigate a problem I am having with research design.
17. ... accepts me as a junior colleague.
18. ... is seldom sad or depressed.
19. ... advocates for my needs and interests.
20. ... talks to me about his or her personal problems.
21. ... generally tries to be thoughtful and considerate.
22. ... is a cheerful, high-spirited person.
23. ... values me as a person.
25. ... has coffee or lunch with me on occasion.
26. ... keeps his or her workspace neat and clean.
27. ... meets with me on a regular basis.
28. ... relates to me as if he/she is a responsible, admirable older sibling.
29. ... recognizes my potential.
30. ... helps me to realize my life vision.
31. ... helps me plan a timetable for my research.
32. ... works hard to accomplish his/her goals.
33. ... provides information to help me understand the subject matter I am researching

Appendix D: Weekly Stress Inventory (WSI-SR)

Did not happen - 0

Happened: not stressful- 1, Slightly stressful- 2, Mildly stressful- 3, Moderately stressful- 4, Stressful- 5,
Very stressful- 6, Extremely stressful- 7

Please identify the amount of stress each event elicited in the LAST 7 days...

1. ___ Had pet peeve violated (someone fails to knock etc.)
2. ___ Was excluded or left out
3. ___ Was without privacy
4. ___ Was ignored by others
5. ___ Was stared at
6. ___ Was lied to, fooled or tricked
7. ___ Competed with someone
8. ___ Had minor injury (stubbed toe, sprained ankle, etc.)
9. ___ Had too many responsibilities
10. ___ Was forced to socialize
11. ___ Did something you were not good at
12. ___ Dealt with rude waiter, waitress or salesperson
13. ___ Was interrupted while talking
14. ___ Was clumsy (spilled or knocked something over)
15. ___ Not enough time for fun (movie, eating out) or recreation
16. ___ Had someone disagree with you
17. ___ Did poorly because of others
18. ___ Argued with a friend
19. ___ Not enough time to socialize
20. ___ Forgot something
21. ___ Was told what to do
22. ___ Lost or misplaced something (wallet, keys)
23. ___ Spoke or performed in public
24. ___ Did not hear from someone you expected to
25. ___ Had someone cut in front of you in line

Appendix E: Brief Cope

1 = I haven't been doing this at all

2 = I've been doing this a little bit (at least once per month)

3 = I've been doing this a medium amount (at least once per week)

4 = I've been doing this a lot (almost daily)

Thinking about graduate school specifically, please respond to the following prompts.

- | | |
|---|---------------|
| 1. I've been turning to work or other activities to take my mind off things. | 1 2 3 4 |
| 2. I've been concentrating my efforts on doing something about the situation I'm in. | 1 2 3 4 |
| 3. I've been saying to myself "this isn't real.". | 1 2 3 4 |
| 4. I've been using alcohol or other drugs to make myself feel better. | 1 2 3 4 |
| 5. I've been getting emotional support from others. | 1 2 3 4 |
| 6. I've been giving up trying to deal with it. | 1 2 3 4 |
| 7. I've been taking action to try to make the situation better. | 1 2 3 4 |
| 8. I've been refusing to believe that it has happened. | 1 2 3 4 |
| 9. I've been saying things to let my unpleasant feelings escape. | 1 2 3 4 |
| 10. I've been getting help and advice from other people. | 1 2 3 4 |
| 11. I've been using alcohol or other drugs to help me get through it. | 1 2 3 4 |
| 12. I've been trying to see it in a different light, to make it seem more positive. | 1 2 3 4 |
| 13. I've been criticizing myself. | 1 2 3 4 |
| 14. I've been trying to come up with a strategy about what to do. | 1 2 3 4 |
| 15. I've been getting comfort and understanding from someone. | 1 2 3 4 |
| 16. I've been giving up the attempt to cope. | 1 2 3 4 |
| 17. I've been looking for something good in what is happening. | 1 2 3 4 |
| 18. I've been making jokes about it. | 1 2 3 4 |
| 19. I've been doing something to think about it less, such as going to movies,
watching TV, reading, daydreaming, sleeping, or shopping. | 1 2 3 4 |
| 20. I've been accepting the reality of the fact that it has happened. | 1 2 3 4 |
| 21. I've been expressing my negative feelings. | 1 2 3 4 |
| 22. I've been trying to find comfort in my religion or spiritual beliefs. | 1 2 3 4 |
| 23. I've been trying to get advice or help from other people about what to do. | 1 2 3 4 |
| 24. I've been learning to live with it. | 1 2 3 4 |
| 25. I've been thinking hard about what steps to take. | 1 2 3 4 |
| 26. I've been blaming myself for things that happened. | 1 2 3 4 |
| 27. I've been praying or meditating. | 1 2 3 4 |
| 28. I've been making fun of the situation. | 1 2 3 4 |

Appendix F: 14-Item Resilience Scale (RS-14)

Please read each statement and circle the number to the right of each statement that best indicates your feelings about the statement. Respond to all statements. (1: strongly disagree, 7: strongly agree)

1. I usually manage one way or another.
2. I feel proud that I have accomplished things in my life.
3. I usually take things in stride.
4. I am friends with myself.
5. I feel that I can handle many things at a time.
6. I am determined.
7. I can get through difficult times because I've experienced difficulty before.
8. I have self-discipline.
9. I keep interested in things.
10. I can usually find something to laugh about.
11. My belief in myself gets me through hard times.
12. In an emergency, I'm someone people can generally rely on.
13. My life has meaning.
14. When I'm in a difficult situation, I can usually find my way out of it.

©2009 Gail M. Wagnild. All rights reserved. "The 14-item Resilience Scale" is an international trademark of Gail M. Wagnild.

Appendix G: Interview Questions

Self-Determination theory and motivation

When did you first decide to pursue graduate school, why?

What skills do you think are necessary to possess as a graduate student? Do you have these skills?

How connected do you feel with others in your program?

How does your area of study help you feel connected with other graduate students outside of your program?

Relationships and support

How do you develop and maintain healthy relationships inside your program of study?

How do you develop professional boundaries with mentors? With peers? With students?

How do you develop and maintain healthy relationships outside your program of study?

Final question

What else would you like to share about your graduate experience?

Appendix H: Coding Manual Provided to Research Assistants

Self-Determination Theory

Self-determination theory (SDT) examines motivation across different settings and factors that contribute to or hinder motivation (Ryan & Deci, 2000). SDT examines how psychological needs influence whether individuals experience desirable outcomes (task completion) or undesirable outcomes (task failure). Motivation compels individuals to engage in and complete tasks, but the underlying desire can be intrinsically or extrinsically based.

Intrinsic motivation occurs when an individual chooses to engage in a behavior for personal reasons (e.g., it makes them happy, they feel connected with others, they experience personal growth); intrinsic motivation is important for continued growth and social development.

Extrinsic motivation occurs when individuals engage in a particular task or behavior because there is external pressure to do so (e.g., the task is required by a job, the individual will be rewarded with money or recognition if task is completed).

Autonomous motivation occurs when the individual engages in a freely-chosen behavior.

However, extrinsic motivation can involve a certain level of autonomous motivation as well and outcomes vary based on how much autonomy is perceived.

- *Integrated regulation* is the most autonomous form of extrinsically based motivation; the individual reports that the outcomes are important, personally relevant, and have been integrated with the individual's personal values.

- *Regulation through identification* occurs when an individual reports that they value a certain rule or goal, and thus it has personal relevance, but has not yet been integrated into that person's set of values.

- *Introjected regulation of behavior* occurs when an individual conforms to the norms of the environment, but they do not personally endorse those values or norms.

- *Externally regulated behavior* is considered the least autonomous because behavior is only the result of external factors; the individual does not view the task or goal as personally relevant or important. When rationale for engaging in a task is provided, people may be more likely to complete tasks, even if the tasks are initially viewed as boring or unimportant (Jang, 2008).

Controlled motivation occurs when a person engages in the specified task because they feel obligated to do so, regardless of their desire to engage in the task (e.g. they are told what to do and how to accomplish the task). When individuals experience controlled motivation they are influenced by external factors, but the outcome tends to be negative. This occurs when individuals complete a task, but are not satisfied after doing so and they may feel depleted (emotionally, mentally, physically). Repeated experiences with controlled motivation may lead to *amotivation*, which is characterized by lack of both intention and general motivation.

Three basic psychological needs inherent to autonomous motivation: autonomy, competence, and relatedness.

Autonomy occurs when an individual is able to self-govern and make decisions on their own

Competence examines whether or not the individual feels like they possess the necessary skills to complete the task,

Relatedness investigates how the specific activity connects the individual with others (Connell & Wellborn, 1991).

*The questions related to maintaining and developing relationships should be taken into consideration for relatedness.

None:0- participant reports having **no** relationships/**no** feelings connectedness

Low:1 -participant reports having very little contact with peers (or people outside of GS).

Potential examples: only interacting with peers during class, actively avoiding or redirecting discussions about personal life, avoiding social events, not adding peers on social media (does not count if participant says they do NOT have social media accounts)

Medium:2 - participant reports enjoying workplace interactions (i.e. labs, classroom, office mates) with peers, they will engage in friendly conversation and sometimes discuss personal events and other topics outside of work, will attend social events hosted by the program, but still maintains some separation between work and personal life

High:3 - participant reports having at least one very close friend in the program and the participant reports feeling very connected. Examples: attending happy hour, parties, attending social events outside of departmental/program hosted events (monthly dinner as a group), travel with members of the group, spend time at each other's houses, live together, discuss personal/private matters outside of class time, rely on person for social or emotional support

INTERVIEW ID:

REMOVE ANY LEFTOVER IDENTIFIERS WITH XXX FROM ALL TRANSCRIPTS

Q1: When did you first decide to pursue graduate school, why? AUTONOMY

Type of Motivation	Yes	No	Unsure	Example (lines)
Intrinsic				
Extrinsic				
Autonomous				
Integrated Regulation				
Regulation through ID				
Introjected regulation of bx				
Externally regulated				
Controlled motivation				
Amotivation				

Q2 and Q3: What skills do you think are necessary to possess as a graduate student? Do you have these skills? COMPETENCE

Skills needed for success	Have skill	Don't have skill	Not confident in abilities/currently working on improving skill	Possessing skill not explicitly stated

Q4: How connected do you feel with others in your program? RELATEDNESS

How do you develop and maintain healthy relationships inside your program of study?

Level of connection	None 0	Low 1	Medium 2	High 3	Example (lines)
Lab					
Program					

Q5: How does your area of study help you feel connected with others outside of your program?
RELATEDNESS

How do you develop and maintain healthy relationships outside your program of study?

Level of connection	None 0	Low 1	Medium 2	High 3	Example (lines)

What else would you like us to know about your graduate experience at CSU?

Record if participant discloses any of the following during the interview:

Reported	Yes or No	Example (lines)
Happy with grad experience		
Concerned about someone else in the program		
Has felt depressed		
Has sought out mental health treatment		
Concerns about lack of diversity		
Would like additional resources		