GRADUATE STUDENTS' MENTAL HEALTH:

DEPARTMENTAL CONTEXTS AS A SOURCE OF DIFFERENTIAL RISK

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"Not all those who wander, are lost"

J.R.R. Tolkien

Dedicated to the memory of my father,

who always supported me, no matter which path I took.

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GRADUATE STUDENTS' MENTAL HEALTH:

DEPARTMENTAL CONTEXTS AS A SOURCE OF DIFFERENTIAL RISK

Research in higher education acknowledges academic performance, progress and general health as adversely impacted by mental health challenges. These challenges are consistent with numerous life changes that accompany the student experience, including changes related to work, finances, social interactions and living conditions. Current scholarship focuses on epidemiological descriptions of psychological disorder, academic outcomes as related to experiences of stress, and help-seeking behavior/service-utilization amongst student populations. This project contributes to the understudied area of graduate student mental health by highlighting the importance of students' *social locations*. Specifically, this project utilizes the stress process model to underscore how institutional contexts influence mental health outcomes and experiences, illuminating how structural, social and academic department cultures create differential risk for graduate students' mental health.

Using the stress process model and a mixed methods approach, I address the following questions:

- Does graduate students' psychological distress vary by division? If so, how much is explained by department characteristics (i.e. mentorship/advising, department climate and funding structure) and by stressors/resources (e.g. role overload, role conflict, isolation, funding uncertainty)?
- Does psychological distress vary by department characteristics? If so, is this relationship mediated by stressors/resources?
- Do department characteristics moderate the relationship between stressors/resources and mental health?

- Are there differences in the effects of department characteristics and stressors/resources on mental health, by gender and race/ethnicity?
- How and to what extent do graduate students understand their social and academic experiences as stressful, and related to features of their departments?

At a basic level, divisions (Natural & Mathematical Sciences vs. Social Sciences) and department characteristics (department climate and funding competition) differentiate students' psychological distress. However, department characteristics do not explain divisional differences; and students' psychological distress is largely explained by proximate stressors and resources. Very little socio-demographic variation is observed. Nevertheless, students' narratives highlight the importance of department characteristics to their stress experiences. Notably, students reflect on perceived inequalities in funding allocation, seeming lack of transparency in department decision-making, challenges defending academic identity, and the social consequences of each. These findings illuminate the importance of institutional contexts and advance current scholarship on education and psychological well-being.

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INTRODUCTION

Graduate students experience numerous life changes that put them at risk for physical and psychological distress (Goplerud 1980, Walfish 2001). These include, but are not limited to, changes related to work, finances, living conditions and social relationships. Although some of these changes characterize this stage of the life course, many are unique to graduate school, and are distinguishable from those that would otherwise be experienced by adults of this age (Blanco 2008, Walfish 2001).

The stress process model is valuable for contextualizing these life changes and highlighting the consequences they have for graduate student mental health because it links structural conditions to stress exposure, support resources and mental health outcomes. Moreover, this model establishes how systems of stratification, social contexts and relationships shape individuals' mental health experiences, including stress. With regard to graduate student mental health, both social location – i.e., the liminal position of graduate students as neither fully professionals nor novices – and the institutional context – i.e., the organization of resources and relationships into graduate departments, within academic fields – are meaningful for delineating exposure to stressors (i.e., the circumstances that give rise to stress), access to coping and support resources (i.e., utilized to change and/or manage stressors) and stress outcomes (Pearlin 1989, Thoits 1995).

Prior research documents pervasive exposure to stressors and access to some support resources amongst graduate student populations – including time constraints, role conflict, role overload, isolation, funding and mentorship/advising relationships (Goplerud 1980, Grady 2014, Walfish 2001). Each of these stressors/resources is related to graduate

students' social locations – i.e., their status in the liminal space between novice students and professionals – and contexts such that their experiences are both unique and distinguishable from those that would otherwise occur during this life stage (i.e., outside of the graduate school context). However, given the endemic stressors/resources to which students are exposed, the question remains: how and why do mental health outcomes differ amongst students *within* graduate school? I suggest that the answer lies in the characteristics of departments – most notably the funding structure, mentorship/advising and department climate. In brief, I argue that the characteristics of departments influence students' mental health outcomes by affecting their exposure and vulnerability to stressors, as well as shaping their access to support resources.

To explore whether the graduate student stress process varies by departments, and most notably, by department characteristics (i.e., mentorship, funding, department climate), I use a mixed methods approach. First, using a quantitative survey, I assess whether students' psychological distress outcomes vary by division. Then, I determine whether variation in psychological distress is mediated and/or moderated by department characteristics, stressors/resources and socio-demographic variation. In follow-up, I examine whether the effects of stressors/resources and department characteristics differ by students' socio-demographic background. And finally, by conducting in-depth interviews and focus groups, I obtain personal accounts from students about the social and academic climate of their respective departments, including relationships with faculty and colleagues. With these narratives, I examine how and to what extent students' experiences are understood and interpreted as stressful, and related to department characteristics. The explicit questions guiding this research are as follows:

i. Do students' psychological distress outcomes vary by division (i.e., across the Natural & Mathematical Sciences, Social Sciences, Arts & Humanities, and Professional Schools)?
    a. If so, is this relationship mediated by department characteristics (i.e., mentorship/advising, funding structure, and department climate)? By stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty, and mentorship/advising)?

ii. Does psychological distress vary by department characteristics (i.e., mentorship/advising, department climate, and funding structure)?
    a. If so, is this relationship mediated by stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty, and mentorship/advising)?

iii. Do department characteristics (i.e., mentorship/advising, funding structure, and department climate) moderate the effects of stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty, and mentorship/advising) on psychological distress?

iv. Are there differences in the effects of department characteristics (i.e., mentorship/advising, funding structure, and department climate) and stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty, and mentorship/advising) on psychological distress, by gender and race/ethnicity?

v. Finally, how and to what extent do graduate students understand their social and academic experiences as stressful, and related to features of their departments?

CONTRIBUTION

While numerous studies detail the causes and effects of mental health challenges in student populations, few studies specifically address graduate students. As a result, current literature inadequately captures the unique social location and context that distinguish graduate students' educational and mental health experiences from their undergraduate counterparts. Specifically, scholars fail to recognize that in positions that neither fully access the institutional power of professionals nor escape the responsibilities of student life, graduate students' stressors, support resources, roles and responsibilities are structured by the graduate institution itself. In short, there is little understanding of the ways in which graduate students' mental health outcomes are related to the institution of graduate school.

This project makes a substantive contribution to current scholarship on education and psychological well-being by 1) examining the understudied population of graduate students, 2) highlighting the importance of graduate students' *social locations* to their mental health outcomes, 3) emphasizing the importance of institutional contexts (i.e., divisions and departments) for graduate students' mental health outcomes, and more specifically 4) focusing on how the structural, social and academic climate of departments create differential risk for graduate students' psychological distress. In addition, this project makes a theoretical contribution to the stress process model by focusing on the importance of *institutional contexts* (as opposed to geographical contexts such as neighborhoods) to delineate individuals' mental health outcomes.

LITERATURE REVIEW

Most current studies on mental health needs at U.S. colleges and universities focus on undergraduate populations (Benton 2004). In the few empirical studies that examine

graduate student mental health, most focus exclusively on students in Professional Schools (e.g., Law and Medical School) or study small subsets of the graduate student population (Givens 2002, Nelson 2001, Toews 1997). To motivate this study, I draw from scholarship on college student mental health from a range of disciplinary fields falling within three broad substantive areas: 1) epidemiological descriptions of psychological disorder and distress; 2) academic and health consequences of mental illness; and 3) help-seeking behavior/service utilization (Byars 2005, Delamont 1999, Eisenberg 2007, Eisenberg 2013, Goplerud 1980, Grady 2014, Hodgson 1995, Hunt 2010, Hyun 2006, Mah 1989, Mallinckrodt 1992, Walfish 2001).

The first and second areas of scholarship are complementary – providing details of the prevalence of distress and disorder, and their consequences. Studies confirm high levels of mental health problems across college student populations (both undergraduate and graduate) with rates as high as 44.7% for graduate students experiencing a stress-related problem within the last year (Hunt 2010, Hyun 2006, Wyatt 2013). With respect to mental disorder, some research reveals that between 25-35% of graduate students experience diagnosable depression during their graduate career (using DSM-IV criteria)(Stecker 2004). In fact, the American College Health Association – National College Health Assessment (ACHA-NCHA) suggests the proportion of graduate and undergraduate students diagnosed with depression has been steadily rising since 2000, despite steady or at most moderate increases in the prevalence of mental disorder among adolescents and young adults in the general population (Hunt 2010). Although the factors at play are complex, current research allows for a basic understanding of the high prevalence of mental distress and disorder among college student populations.

Moving beyond prevalence, some scholars have turned their attention to better understanding the *consequences* of mental illness amongst student populations, which include self-harm and substance abuse, and academic consequences such as attrition, lengthy time-to-completion, and overall poor academic performance (Byars 2005, Wyatt 2013). In fact, it is relatively well documented that mental health challenges among student populations are linked to cigarette smoking, substance abuse, binge drinking, poor academic adjustment, less effective time management, falling behind on schoolwork, missing class, prematurely ending one's education, lower academic self-efficacy, and overall academic failure (Byars 2005, Walfish 2001, Wyatt 2013).

Finally, a third line of research attends to help-seeking behavior and mental health service utilization amongst student populations (Eisenberg 2007, Hyun 2006, Wyatt 2013). Closely in line with the general population, findings suggest that while the prevalence of mental health needs among graduate students is high, their help-seeking behavior and service utilization are relatively low (Eisenberg 2007, Hunt 2010, Hyun 2006). This underutilization of mental healthcare services amongst college students is most notably attributed to inadequate knowledge and access to high-quality services, misunderstanding of availability and applicability of services, insurance and/or financial barriers, stigma, lack of understanding and support from family and friends, racial/cultural norms, etc. (Eisenberg 2007, Grady 2014, Hunt 2010, Hyun 2006, Wyatt 2013).

Although scholarship has made significant strides within the three areas outlined above, some research has blurred the line regarding fundamental differences between undergraduate and graduate students. With many common stressors between them – including test anxiety, transitions to school, relationship issues and course overload – some researchers have tested the hypothesis that undergraduate and graduate students have similar

rates of mental health problems (Fisher 1994, Pfeiffer 2001, Wyatt 2013), and healthcare service utilization (Hunt 2010). However, their findings suggest that undergraduate and graduate student populations are differentiable, warranting independent exploration. For example, while some studies report poorer mental health for undergraduates (Wyatt 2013), others suggest poorer and more complex mental health challenges amongst graduate students (Pfeiffer 2001, Silverman 1997). Regarding healthcare utilization, research generally demonstrates that students at various levels of need underutilize services, whether undergraduate or graduate students (Hyun 2006, Wyatt 2013).

Failing to distinguish undergraduate and graduate students' experiences ignores the unique social location of graduate students and the relevance of department characteristics to their mental health outcomes. With few exceptions (Byars 2005, Grady 2014, Hyun 2006), research has given little attention to the structure and culture of educational institutions (i.e., context) as linked to the mental health outcomes of graduate students. In other words, research has been overwhelmingly concerned with describing *what* students' academic and mental health experiences are, rather than constructing an argument about *how* students' experiences are linked to institutions themselves. In the few studies that do examine how the context of graduate school and students' experiences within them influence psychological well-being, some are limited by small sample sizes (Goplerud 1980, Grady 2014, Mechanic 1978), while others have few department-level measures (Hodgson 1995, Wyatt 2013). Nevertheless, they coalesce by suggesting that the social position of graduate students within academic institutions gives rise to unique sources of stress. These may include intra-role strain within the academic role-set, inter-role conflict between academic and nonacademic responsibilities, troubled mentoring relationships, isolation and inadequate funding (Grady 2014, Hodgson 1995, Wyatt 2013). Further, they determine that student-

faculty relationships and financial strain may be especially central to the graduate school climate (Goplerud 1980, Mechanic 1978), impacting students' reports of stress, morale and psychological well-being (Goplerud 1980, Hodgson 1995, Mechanic 1978, Wyatt 2013). One exception to the small sample size and limited department-level measures of the research above is the work of Hyun et al. (2006), who conducted a large survey of 3,121 graduate students to determine how and under what circumstances students seek and utilize psychological services. They find that almost half (44.7%) of graduate respondents report having a stress-related problem in the last year, which significantly affected their emotional well-being and/or academic performance, while 30.9% of respondents report seeking care from a mental health service provider (Hyun 2006). Unfortunately, their study only acknowledges that graduate school is a departure from the formal structure of undergraduate studies (e.g., requiring greater self-direction), without explicitly measuring and hypothesizing how department characteristics may influence mental health service utilization. Therefore, when they find significant discrepancies between reported needs and service utilization, they fall short of explaining the structural implications of their study findings.

Privileging structure, context and social location, I will examine whether graduate students' mental health outcomes differ across divisions, and whether these differences are mediated by characteristics of departments themselves (i.e., mentorship/advising, funding, and department climate), and stressors/resources (i.e., role overload, isolation, funding uncertainty). Utilizing the stress process model as a framework, I examine this understudied population and explicate how divisional traditions (i.e., socialization practices within divisions) are related to the structure and culture of departments, which in turn, through stressors and support resources, shape the mental health outcomes of graduate students.

THE STRESS PROCESS MODEL

Over the past several decades, sociologists have utilized the stress process model to advance our understanding of the population distribution of mental health. This model attributes the origins of stress to macro, socio-structural factors that provide the social context within which stressors, coping resources and mental health outcomes arise (Pearlin 1989, Thoits 1995). Research supporting the link between macro-level factors and individuals' stress experiences points to the fact that stress exposure accounts for a substantial portion of the observed variation in psychological distress and depressive symptoms, across socio-demographic groups (Schwartz 2010, Turner 2003, Williams 1997). Further, the stress process model proposes that when faced with stressors, individuals may draw upon coping resources – namely, social support, self-esteem and mastery – to effectively moderate and/or mediate stress (Thoits 1995). However, given that coping resources arise from the social contexts within which individuals are immersed, they too are structured, and therefore vary by socio-demographic background and other structural factors (Krause 1989, Thoits 1995). Consequently, both mental health risk and coping resources are socially structured.

Applied to the research questions of this project, the stress process model illuminates how department contexts give rise to distinct mental health experiences across the graduate student population. Detailed in Figure 1 (below), five central components characterize this context and the relationships within – Department Context (A), Department Characteristics (B), Stressors/Resources (C), Social Background (D), and Mental Health (E). The department context (A) includes divisions/divisional traditions, which form the environment where graduate students' mental health experiences unfold. Department Characteristics (B) are the features that distinguish departments including mentoring/advising relationships, department climate and the graduate funding structure. Stressors/Resources (C), originating

from the departments, include time constraints, role overload, isolation, and funding uncertainty. Social background (D), characterizes the socio-demographic factors that influence students' exposure to stressors/resources and their mental health outcomes – namely race/ethnicity and gender; while the outcome assessed is mental health measured by psychological distress (E).

Variation in Mental Health by Division

Do students' mental health outcomes (E) vary by division?

This first research question examines causal link (a) – I will begin with what we know about departments and describe how they are related to divisions. Research suggests graduate students pursuing doctoral work are socialized to cultivate loyalty in accordance with their broad academic division – e.g., Social Sciences, Natural & Mathematical Sciences, and Arts & Humanities (Delamont 1999, Parry 1997). Much like Bourdieu (1988) describes in *Homo Academicus*, this involves the prolonged investment of students, faculty, and staff in developing academic identities that foster collective membership. Therefore, I conceptualize department contexts as related to *divisional traditions* – the socialization practices of novice learners, including the discovery of unwritten rules and norms of thought and behavior (Delamont 1999). The mechanisms by which the socialization and demarcation of divisions occurs are, in part symbolic (e.g., by virtue of the "clear" boundaries academics draw between divisions), however, they also reflect concrete principles regarding division of labor, "originality" of research, teaching beliefs and practices, creation of scientific and academic knowledge, etc. (Delamont 1999, Jones 2011). In other words, divisional traditions represent the cultivation of narrowly defined, ascribed social roles, which define how to be an academic within a particular division, and by extension – department (Delamont 1999).

In research on higher education, these divisional traditions are captured by classificatory schemes that, for example, make distinctions between the "hard" and "soft" sciences, to describe the culture, socialization practices, epistemology and methodology within divisions (Becher 1989, Biglan 1973, Kolb 1981). The most notable of these schemes are credited to Biglan (1973a) and Becher (1989) who largely agree that academic divisions can be characterized on the basis of three dimensions – hard/soft, pure/applied and life/nonlife sciences. In the first dimension, the hard sciences (such as Physics, Chemistry and Engineering) and soft sciences (such as Psychology, Sociology and Anthropology) are alike in their foundation of scientific discourse but vary on the basis of perceived methodological rigor, exactitude and objectivity. However, contrary to colloquial misconceptions, the hard/soft distinction is best understood as a spectrum rather than a binary; with the hard sciences and Arts & Humanities (such as History and English) clustered at either end, and the Social Sciences scattered between (for more on this, see Biglan 1973a). Regarding the pure/applied dimension, pure sciences (such as Mathematics, Political Science and Philosophy) are concerned with discovery, explanation, understanding and interpretation, while the applied sciences (such as Accounting, Finance and Engineering) are concerned with the practical application of their subject matter to products, techniques, protocols and procedures (Biglan 1973a). Lastly, the life/nonlife dimension distinguishes between organic objects of study (such as in Biology, Agriculture and Political Science) versus inorganic objects of study (such as in Languages, Computer Science and Astronomy).

Given contemporary shifts in research practice, many sciences once considered "pure", such as Sociology, have transitioned in favor of balancing both theoretical and applied practices. As such, the former broad distinction between the pure and applied sciences is now less useful in research application (Gardner 2009). In addition, some

empirical research suggests that the life/nonlife dimension has little bearing on the training of doctoral students, and their resultant success – such as rates of completion (Gardner 2009). In this manner, academic divisions are environments within which narrowly defined, social, academic and professional roles are cultivated (Delamont 1999, Gardner 2009). As a result, the training of doctoral students is also delineated along academic divisions – and by extension, departments – including, but not limited to, the communication of norms regarding the allocation of time to research, teaching and service and the supervision of research activities (Delamont 1997, Gardner 2009).

Empirical evidence suggests that these classification schemes summarize the everyday realities of faculty, staff and graduate students within departments of the same division, without implying complete homogeneity (Delamont 1999). For example, graduate students in the Natural & Mathematical Sciences as compared to their Social Science and Arts & Humanities counterparts report greater collaboration with colleagues and faculty (Delamont 1999). This is due to both the norms of research practice in the Natural & Mathematical Sciences, as well as the nature of the research conducted (Delamont 1999).

How though do these everyday realities translate into diverse mental health outcomes across students from different departments? Some empirical evidence suggests that students in the Social Sciences as compared to their Natural & Mathematical Science counterparts report greater stress during the writing stages of the graduate career (Delamont 1999). Others find that only students in the Arts & Humanities show significant differences from their counterparts, with regard to self-reports of stress-related events within the last year[1] (Hyun 2006). However, few other studies capture divisional differences in graduate students' stress experiences. Thus, based on the empirical evidence and differences in

[1] Despite this finding, Hyun et al.'s (2006) study design does not allow for further investigation of why graduate students in the Arts & Humanities report higher, recent stress-related events.

divisional traditions described above, I hypothesize that graduate students' mental health varies across divisions and departments, in the following manner:[2] I hypothesize that graduate students' in departments within the Arts & Humanities (e.g., English) and in the Social Sciences (e.g., Sociology) will have higher psychological distress than their counterparts in the Natural & Mathematical Sciences (e.g., Biology).

Variation in Students' Psychological Distress by Divisions, mediated by Department Characteristics

To begin, I examine the relationship (b) between department context (A) and department characteristics (B). Research suggests meaningful differences in students' accounts of mentorship/advising, department climate, and funding structure between the Natural & Mathematical and Social Sciences (Delamont 1999), although less attention has been paid to the Arts & Humanities. Beginning with mentorship/advising, the most important dimensions to note are whether and how relationships are initiated – i.e., absence vs. presence and student-initiated vs. assigned. By virtue of the "research team" model common in the Natural & Mathematical Sciences, mentorship/advising relationships typically take the form of official, assigned supervision by a faculty member and/or postdoctoral researcher (Delamont 1999, Golde 2005). In contrast, the more common "individualized" model in the Social Sciences dictates that graduate students largely bear the personal responsibility for their academic progress by initiating mentorship/advising relationships with faculty (Delamont 1999, Phillips 1979). Mentorship/advising in the Arts & Humanities follows a similar vein, in that it is routinely initiated by the student and considered a disciplinary norm for the success of graduate students engaged in doctoral work (Phillips 1979).

[2] For the purposes of this dissertation, the primary divisions of interest will be the Arts & Humanities, Natural & Mathematical Sciences and Social Sciences.

I hypothesize that department climate also varies by division. By department climate, I mean the department *ethos* – characterized by the nature of social and professional relationships between faculty and graduate students (i.e., the level of collegiality in a department). For example, the "research team" model in the Natural & Mathematical Sciences, which contributes to the group mentorship/advising style, has been described by students as contributing to a department context that is more cooperative than competitive, relative to the Social Sciences and Arts & Humanities (Delamont 1999). This is plausible since the process of selecting and securing a mentor/adviser in the Social Sciences and Arts & Humanities is typically initiated by the student, which may give rise to competition between graduate students, especially when the faculty to student ratio is skewed, or certain faculty members are in demand (Delamont 1999). In contrast, although some labs will be in greater demand than others, the "research team" model of the Natural & Mathematical Sciences, and the frequency with which lab rotations take place, may diminish tension between graduate students, and may even facilitate a network of student-faculty relationships.

The funding structure also varies across departments. By funding structure, I mean whether the department offers incoming students guaranteed financial assistance, the configuration of this assistance (i.e., in the form of an assistantship – research or teaching – fellowship or other scholarship), the number of years of assistance offered, and students' assessments of funding competition. For example, in the Natural & Mathematical Sciences, the "research team" model is directly linked to the acquisition and permanence of research funding for ongoing projects, which keeps research teams in business. Therefore, the "research team" model impacts the mentorship/advising, department climate, funding and direction of research simultaneously, which influences the pedagogic continuity of the

research team. In the Social Sciences, the "individualized" model may explain mentorship/advising patterns, department climate and the lesser continuity in funding for research projects, relative to students in the Natural & Mathematical Sciences (Delamont 1999). In addition to these differences in the funding structure, on average, students in the Natural & Mathematical Sciences are paid more than their Social Science counterparts. It is difficult to carry forward this comparison with regard to the Arts & Humanities because little research compares across these disciplinary fields.

Turning our attention to graduate students' mental health, I hypothesize that students in departments without a mentorship/advising program will experience greater psychological distress than their counterparts. That is, I expect students navigating graduate school without access to faculty support (by means of a formal mentorship/advising program) to experience greater distress than those who have access. In addition, because of differences in power and status between faculty and students, I expect students to experience greater psychological distress in departments where faculty mentors/advisers are not assigned – i.e., where mentorship/advising relationships are student-initiated. Specifically, I expect the power differential between faculty and students to make it difficult for students to approach potential mentors/advisers. In contrast, I expect students in departments with assigned supervision by a faculty member to experience less psychological distress than students in departments without assigned supervision.

With regard to department climate, I expect the disciplinary "models" discussed above to influence students' psychological distress. In departments that establish a collaborative climate (i.e., primarily in the Natural & Mathematical Sciences) students will feel more support and their psychological distress will be low. Meanwhile, in departments in

the Arts & Humanities and Social Sciences, which may exhibit more competitive/conflicted department climates, students will exhibit greater psychological distress.

Lastly, I anticipate that funding structure will influence students' psychological distress depending on the extent to which departments help them meet research, tuition and living expenses for the duration of their program (Golde 2005). In addition, I expect that students' psychological distress will be reduced when departments make a concerted effort to eliminate competition for funding between students (i.e., by providing guaranteed financial assistance to as many students as possible). As noted earlier, financial support may be tied to the "research team" or "individualized" models typical of the broad division; however, empirical evidence from a wide range of departments suggests that guaranteed funding, to a greater or lesser extent, is relatively common among doctoral students (Golde 2005). In addition, it is worth noting that external fellowships, engagement in extra-departmental part/full-time work and/or personal funds will impact the extent to which the department funding structure influences students' psychological well-being. For example, the availability of department funding will matter less for students with external fellowships than for students without other sources of financial support, and vice versa.

As has become evident, the departments to which students belong largely dictate the policies and practices that impact their daily lives, including their experiences with mentorship/advising, department climate and funding structure. Although these policies and practices are clearly shaped by divisional norms, the characteristics of departments (B) may mediate the relationship between department context (A) and psychological distress (E). This proposed relationship is represented as follows:

- Department Contexts (A) adhering to the "research team" model (e.g., those in the Natural & Mathematical Sciences) will be associated with lower levels of

psychological distress (E) amongst students. Students in department contexts (A) adhering to the "individualized" model (e.g., those in the Arts & Humanities and Social Sciences) will have higher levels of psychological distress (E) amongst students.

- Department characteristics (B) will, in part, explain how and why Department Contexts (A) have an impact on students' psychological distress outcomes (E). Namely, variations in mentorship/advising, department climate and funding structure will mediate the effect of department contexts (A) on psychological distress (E).

Variation in Students' Psychological Distress by Divisions, Mediated by Stressors/Resources

Independent of department characteristics (B), stressors/resources (C) may also mediate the relationship between department contexts (A) and psychological distress (E). In other words, it is reasonable to expect that some of the variation in students' psychological distress, caused by the department context, is a function of the stressors/resources that arise within departments – namely, time constraints, role overload, role conflict, isolation, funding uncertainty, and mentorship/advising quality.

Beyond the stressors characterizing early adulthood (e.g., the death of a loved one, having a health problem, etc.), graduate students endure additional stressors that stem from graduate school itself, and most notably from their immediate departments (Goplerud 1980, Grady 2014, Hyun 2006). These range from funding constraints, isolation, time constraints, role conflict (i.e., work/life balance), pressures related to research, teaching and publishing, difficulty with feedback regarding departmental standing, ambiguous expectations from

advisers, and finding employment (Delamont 1999, Goplerud 1980, Grady 2014, Hyun 2006, Kurtz-Costes 2006, Mallinckrodt 1992, Walfish 2001). However, comparing varied, graduate student populations (e.g., students in "hard" vs. "soft" sciences; MA vs. PhD students, etc.) and using diverse empirical approaches, a number of research studies describe the pervasiveness of time constraints, role overload, role conflict, isolation, funding uncertainty and mentorship/advising quality (Delamont 1999, Grady 2014, Hyun 2006, Mallinckrodt 1992, Nelson 2001, Walfish 2001). Ultimately, these stressors may impact psychological distress by creating barriers for students' access to and utilization of social support resources, and/or by directly threatening students' mental health.

Time constraints, role overload and role conflict are related to the responsibilities that students fulfill within graduate school, and especially to the demands of their academic positions. For example, graduate students may experience time constraints while pursuing research, teaching and service, alongside non-academic responsibilities (e.g., maintaining a home) (Grady 2014). This may be exacerbated by competing and/or conflicting demands between academic roles, and non-academic responsibilities (i.e., inter-role conflict) (Grady 2014). For example, graduate students may confront the simultaneous, conflicting demands to privilege research (from their advisers) and teaching (from their students), both of which are required to successfully fulfill the academic responsibilities of graduate training. Ultimately, these constraints and conflicts make it difficult for students to be successful in their academic and non-academic lives, if demands exceed their reserves of energy and stamina (i.e., role overload) (Pearlin 1989).

However, the extent to which students experience time constraints, role overload and role conflict will vary across divisions and departments. For example, in divisions that place great value on the publishing and presentation of scientific research, graduate students

may privilege academic work at the expense of work-life balance, contributing to the role overload/role conflict they experience. In fact, in the Natural & Mathematical Sciences, where the pressure to publish and present academic work coincides with especially long work weeks (it is not uncommon for students to spend 40+ hours per week in lab, while fulfilling other academic responsibilities), role overload and role conflict (with other obligations) may be quite common. In contrast, graduate students in the Social Sciences and Arts & Humanities, although subject to similar publication and presentation standards, may experience less role overload and role conflict as a result of, on average, longer degree time-to-completion (i.e., more time to complete degree requirements).

Much as time constraints and role overload/role conflict, isolation – social, physical and/or intellectual – are typical for doctoral students to experience at some point in their graduate careers (Delamont 1999, Mechanic 1978). More specifically, it is common for graduate students across divisions and departments to report having little time and energy to socialize outside of work and to report feeling isolated while working on research (Delamont 1999, Goplerud 1980, Grady 2014, Hyun 2006, Nelson 2001). Although all students are likely to experience some isolation because of work responsibilities, their experiences may vary due to department climate. For example, Delamont, Atkinson and Parry (1999) address the importance of colloquia/conferences for keeping students connected to their department and fellow colleagues. In their qualitative study, social scientists reported both social and intellectual isolation in the absence of these forums to keep them embedded within research communities (Delamont 1999). Similarly, students in the Arts & Humanities reported feeling isolated while conducting fieldwork and upon their return 'home', with pressure mounting to produce the thesis/dissertation and research publications (Delamont 1999). In contrast, students in the Natural & Mathematical Sciences reported less isolation as

their work was highly integrated with lab colleagues (Delamont 1999). Students in both the Social and Natural & Mathematical Sciences mentioned their respective regional and national organizations as a mechanism by which they connected to communities of scholars, which ameliorated their experiences of isolation (Delamont 1999). In part, this evidence suggests that the nature of the work conducted in broad divisions contributes to the isolation that students experience (e.g., while chemists may experience little isolation during lab work, anthropologists may feel a great deal during and post-fieldwork). However, this evidence also points to the fact that students experience various types of isolation at different times in their graduate career, depending on the climate and culture in their respective departments.

Empirical research on graduate student mental health demonstrates that financial problems are amongst the most frequently reported stressors related to psychological distress (Hodgson 1995, Hyun 2006, Pfeiffer 2001). It is typically described as a direct strain on students through the lengthy duration of their graduate career with limited financial resources, and/or by the financial insecurity students feel while finishing their graduate training (Grady 2014, Hyun 2006, Nelson 2001). Although financial constraints are commonplace for all graduate students, much like role overload/role conflict and isolation, variation across divisions and departments puts some students at disproportionate risk. For example, because many students prefer to undertake graduate study on a full-time basis, sufficient funds to cover the cost of living, academic and miscellaneous expenses over an extended period of time are of primary concern. Therefore, given the lengthy time-to-completion for doctoral degrees in the Social Sciences and Arts & Humanities, I expect funding uncertainty to contribute to the greater psychological distress of these students, relative to their counterparts. Although many students choose to support themselves through ancillary jobs or personal loans, if teaching assistantships and fellowships do not

cover basic living expenses, the income from these jobs is likely a temporary solution for their fiscal needs, meanwhile exhausting them physically and mentally (Pfeiffer 2001).

With regard to mentorship/advising quality, research in higher education suggests that student-faculty relationships may shape student protégés' experiences in two ways: influence and support. On the one hand, graduate advisers/mentors may model behavior that student protégés emulate (influence), and on the other, they may provide support in the form of "sponsorship, protection,[…], counseling, acceptance, confirmation, and/or coaching" (Phillips 2000, Rose 2005). Integrating the work of social psychologists, student-faculty advising/mentoring relationships may benefit students by means of social influence, informational, and emotional social support, each of which has been linked to psychological well-being (Thoits 2011). For example, by means of social influence/social comparison, graduate students may evaluate and mirror their own beliefs and practices based on those modeled by faculty advisers/mentors. Therefore, if faculty advisers/mentors model positive work habits that simultaneously reduce stress – e.g., shutting off email during designated, daily work periods – this may promote "good behavior" for students' academic productivity and psychological well-being. In addition, faculty may provide concrete informational support to the student such as advice, appraisal and interpretation, which may make progress through the graduate program more efficient or successful, bolstering the students' sense of mastery or control (Rose 2005, Thoits 2011). Lastly, graduate students may receive emotional support in the form of encouragement, sympathy and coping assistance, contributing to students' self-esteem and a heightened sense of personal control (Rose 2005, Thoits 2011). Therefore, students' psychological well-being may benefit from receiving some or all the modeling techniques, support strategies, and resources described above, from diverse networks of mentors/advisers. However, it is feasible that student-faculty

relationships may be detrimental to students when advisers/mentors model poor academic behavior, give poor advice, and provide unconstructive feedback to their students (Rook 1984). This may lead to dysfunctional advising/mentoring relationships, which in turn would have deleterious effects on students' psychological well-being. Therefore, I hypothesize that graduate students' psychological well-being will be linked to the content and quality of advising/mentoring relationships that arise within departments (Johnson 2002, Rook 1984, Thoits 2011).

Given the relationships described above, I propose to explicitly test the relationship (d) between Department Contexts (A) and Stressors/Resources (C), as well as the relationship (e) between Stressors/Resources (C) and students' psychological distress (E). Doing so will isolate whether stressors/resources mediate the relationship (a) between Department Contexts (A) and psychological distress (E). In addition, it will empirically substantiate the importance of institutionally-bound stressors/resources and provide a more complete picture of the high-risk context of graduate students' mental health.

Variation in Mental Health Outcomes by Department Characteristics, Mediated by Stressors/Resources

Do students' mental health outcomes (E) vary by department characteristics (B) (i.e., mentorship/advising, department climate, and funding structure)? If so, is this relationship mediated by stressors/resources (e.g., time constraints, role overload, role conflict)?

There are direct relationships (c) between department characteristics (B) and graduate students' mental health (E), but how might stressors/resources (C) mediate them? Beginning with mentorship/advising, both the structure (i.e., absence/presence, assigned/student-initiated) and quality (e.g., student-faculty "fit") of student-faculty

relationships will matter for students' experiences of psychological distress. For example, departments with an official mentorship/advising program will lend themselves to better faculty mentors/advisers (compared to departments that do not), because of the resources allotted to ensure the programs run effectively. In contrast, I expect the quality of mentorship/advising relationships to be poorer in departments where an official mentorship/advising program is absent, such that resources for faculty, including mentorship training, will be lacking or non-existent.

In a similar vein, a department without a formal mentorship/advising program may contribute to students feeling less connected to the division, department, and even the institution as a whole. This may cause students to experience greater psychological distress by means of isolation. All in all, I hypothesize that the quality of mentorship/advising relationships and isolation mediate the relationship between the structure of mentorship/advising and psychological distress.

Next, I make the argument that isolation and role overload mediate the relationship between department climate and psychological distress. For example, in cases where a department is unsupportive, individualistic, competitive and/or conflictive (features of department climate), students are likely to experience greater isolation and as a result, greater psychological distress. One would also expect the reverse to be true; that students in departments with collegial, supportive climates would experience less isolation and, consequently, less psychological distress. Therefore, I anticipate that isolation mediates the relationship between department climate and psychological distress. It is my expectation that role overload functions similarly to isolation in this regard. That is, in a department with a collegial, supportive environment, students will likely have access to the resources (via faculty and other students) they need to confront and address academic demands (e.g.,

research, teaching and service), leading to lower psychological distress. As with the previous argument, I also expect the reverse to be true; departments with competitive and/or conflictive climates will likely exacerbate students' experiences of role overload. Therefore, role overload may mediate the relationship between department climate and psychological distress.

Finally, regarding the relationship between funding structure and psychological distress, I anticipate that funding uncertainty will be a mediating factor. In departments that do not offer guaranteed funding in the form of fellowships and/or assistantships, students may experience greater funding uncertainty. Feeling tentative about their financial future will likely increase their psychological distress. In contrast, students in departments with guaranteed funding of some kind are less likely to experience funding uncertainty, and as a result will experience less psychological distress.

Department Characteristics Moderate the Effects of Stressors/Resources on Mental Health Outcomes

Although considerable variation will occur, and not all stressors/resources will necessarily come into play, the aforementioned hypotheses suggest that it is feasible for some stressors/resources to mediate the relationships between department characteristics and psychological distress. However, the question remains, do department characteristics (i.e., mentorship/advising, funding structure, and department climate) moderate the effects of stressors/resources (i.e., role overload/role conflict, isolation, funding uncertainty) on mental health outcomes? (See Figure 1.1; [g])

Mentorship/Advising

I hypothesize that the structure of mentorship/advising (i.e., the presence vs. absence, student-initiated vs. faculty-assigned) moderates the relationship between role overload and mentorship/advising quality with psychological distress. In this regard, the most important component of the mentorship/advising structure is whether student-faculty relationships are student-initiated or assigned (Cutrona 1990, Nurullah 2012, Rose 2005). If mentorship/advising relationships in a department are assigned, this may ameliorate the effects of role overload (i.e., energy and stamina demands) for students. In contrast, departments with student-initiated mentorship/advising relationships may exacerbate the effects of role overload for graduate students – i.e., as an additional responsibility above and beyond those inherent to the doctoral program, such as research, teaching and service obligations. As a result, the structure of mentorship/advising is hypothesized to moderate the effects of some stressors/resources on students' experiences of psychological distress.

Department Climate

In addition, I hypothesize that department climate may moderate relationships between some stressors/resources – namely role overload/role conflict, isolation, funding uncertainty and mentorship/advising quality – and psychological distress (See Figure 1.1; [g]). When department climate is collegial and cooperative, this may moderate the relationship between role overload/role conflict and psychological distress for graduate students. In other words, when faced with the taxing demands of simultaneous responsibilities (e.g., teaching, research, service, and non-academic responsibilities), a department that is collegial/cooperative may create the feeling that "we're all in this together", dampening the deleterious effects of role overload/role conflict for students.

In a similar vein, department climate may moderate the relationship between isolation and psychological distress. Although isolation in graduate school is a relatively common experience (due to the nature of doctoral work), I expect the effect of isolation to be tempered by the department climate to which students belong. For example, if a student belongs to a department that encourages collegiality, this may diminish the effect of isolation and reduce their experience of psychological distress. In contrast, a department characterized by conflict may exacerbate the effects of isolation that students experience, putting them at greater risk for psychological distress. Additionally, department climate may moderate the relationship between funding uncertainty and psychological distress. That is, when students are concerned about not having enough financial support to complete their graduate degrees, a collegial department climate may dampen the effects of financial insecurity by way of colleagues sharing submission calls for grants, fellowships and assistantships, as well as sharing resources for successful submissions, leading to lower student psychological distress.

Lastly, department climate may moderate the relationship between mentorship/advising quality and psychological distress. That is, department climate may provide the context within which students interpret their mentorship/advising relationships with faculty. For example, if a student in a collegial department has a poor relationship with his/her own faculty adviser/mentor, this may exacerbate their experience of psychological distress. Alternatively, a student may exhibit less psychological distress, relative to their counterparts, if they have a rewarding relationship with their faculty adviser/mentor in a department with a conflicted climate. All in all, the effect of mentorship/advising quality on psychological distress may be moderated by the climate of the department to which the student belongs.

Funding Structure

Funding structure (i.e., the offer and configuration of financial support and the competition for funding within a department) may moderate the relationship between time constraints, role overload, and funding uncertainty with psychological distress. In the absence of an offer of guaranteed, multi-year financial support, the effect of time constraints may be exacerbated as graduate students seek opportunities to maintain their financial security (e.g., a part time job) while maintaining ongoing responsibilities (such as research, teaching and service). Therefore, in cases where the funding structure does not provide multi-year financial support for graduate students to complete their degrees, the effect of time constraints on psychological distress will be especially pronounced.

The funding structure may also moderate the relationship between role overload and psychological distress. For example, the effect of role overload on psychological distress may be exacerbated for students without guaranteed funding and/or in departments with funding competition, because in addition to workload responsibilities, they are burdened by financial strain. On the other hand, the effect of role overload on graduate students' psychological distress may be diminished when department funding is guaranteed and/or when competition for funding is low.

Lastly, funding structure may moderate the relationship between funding uncertainty and psychological distress. Students likely experience some degree of funding uncertainty before beginning their doctoral programs, primarily because of the lengthy time-to-completion for many programs, and the uncertainty of the job market afterward. However, when the funding structure in a department is favorable to students, such that it provides multi-year financial support, the effect of this uncertainty on psychological distress may be

less. Therefore, I expect that when a department offers multi-year financial support of any kind, the effect of funding uncertainty on students' psychological distress will be diminished.

Socio-demographic Variation in the Effects of Department Characteristics on Mental Health

Are there differences in the effects of department characteristics (i.e., mentorship/advising, department climate and funding structure) on mental health outcomes, by gender and race/ethnicity?

This brings us to the question of whether the effects of department characteristics on psychological distress differ by students' social background (represented by arrow h). In other words, do the mentorship/advising, department climate and funding structure of departments have differential impact on psychological distress based on students' race/ethnicity and gender?[3] To begin, I expect that the structure of mentorship/advising will have a larger effect on the psychological distress of racial/ethnic minorities and women, compared to their White and male counterparts, respectively. This hypothesis is grounded in the argument that graduate students' stress experiences are delineated, at least in part, by structures of inequality (Thoits 1995). Therefore, because racial/ethnic minorities and women are more likely to face issues related to their marginalized statuses (e.g., via tokenism, microaggressions, symbolic racism and sexism), they are likely to see greater benefits from mentorship/advising programs, compared to their White and male counterparts. In other words, in departments where mentorship/advising exists, I expect the benefits for females and racial/ethnic minority students to be greater, since faculty support will be especially

[3] Although other socio-demographic factors may influence department characteristics and psychological distress (e.g., age, marital status, sexual orientation, etc.), literature from higher education is limited regarding their impact on students' academic and mental health experiences. Therefore, analysis for this project will be limited to race/ethnicity and gender.

integral to their navigation and success in academic spaces. In fact, drawing from research on work and employment, mentor relationships are especially crucial for women and racial/ethnic minorities to acquire concrete advice and guidance for career advancement, especially as they face many obstacles to advancement that their counterparts do not (Dedrick 2002, Tharenou 2005, Walfish 2001).

Similarly, the funding structure of a department will have a larger effect on psychological distress for female and racial/ethnic minority students. On the one hand, since students of racial/ethnic minority backgrounds report stronger familial obligations and are more likely than their counterparts (i.e., Whites) to shoulder the burden of caregiving responsibilities, an offer of guaranteed funding from their department is likely to facilitate meeting these obligations, and therefore have a larger positive effect on their psychological distress (Corona-Ordonez 2013, Pinquart 2005). Similarly, for female graduate students, a department offer of guaranteed funding may help with fulfilling caregiving obligations, which are often the primary responsibility of women. Overall, relative to men, I suggest that women will experience a greater beneficial effect on their psychological distress from an offer of guaranteed funding versus their male counterparts (Maher 2004).

Lastly, department climate may have a larger impact on psychological distress for racial/ethnic minorities and women. For example, a supportive, flexible department climate may help both female and racial/ethnic minority students balance their academic and familial obligations (e.g., by offering temporary leave), benefitting their psychological distress, relative to their counterparts. In contrast, a department with an unsupportive, inflexible climate may exacerbate the psychological distress for female and racial/ethnic minority students.

Socio-demographic Variation in the Effects of Stressors/Resources on Mental Health

Are there differences in the effects of stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty) on mental health outcomes, by gender and race/ethnicity?

A final question that requires consideration is whether the effects of stressors/resources on psychological distress (indicated by arrow e) differ by students' social backgrounds (indicated by arrow j). For example, the effect of mentorship/advising quality on psychological distress may be greater for female graduate students than their male counterparts because the mentorship needs for women in male-dominated spaces (which characterize many graduate departments) are greater (Rose 2005, Walfish 2001). That is, although faculty mentors are poised to provide mentoring support to all students, female graduate students may have greater needs by virtue of the institutional barriers they face that their male counterparts do not (School 2013, Walfish 2001). As a result, the effect of poor mentorship/advising quality may be especially deleterious for female graduate students who need faculty support for both work responsibilities and to navigate gender role conflict and sexism, should it arise, during their personal and professional development (Walfish 2001). Similarly, women, who have disadvantageous social positions (along most dimensions) relative to their male counterparts, may experience greater effects from isolation in graduate school. In short, by virtue of female students' greater need for faculty support and overall inclusion in academic circles, the effects of mentorship/advising quality and isolation are likely greater. Lastly, because female graduate students depend more on financial support from personal savings and from family for their degree completion (Maher 2004), the effect

of funding uncertainty on their psychological distress may also be greater than it is for their male counterparts.

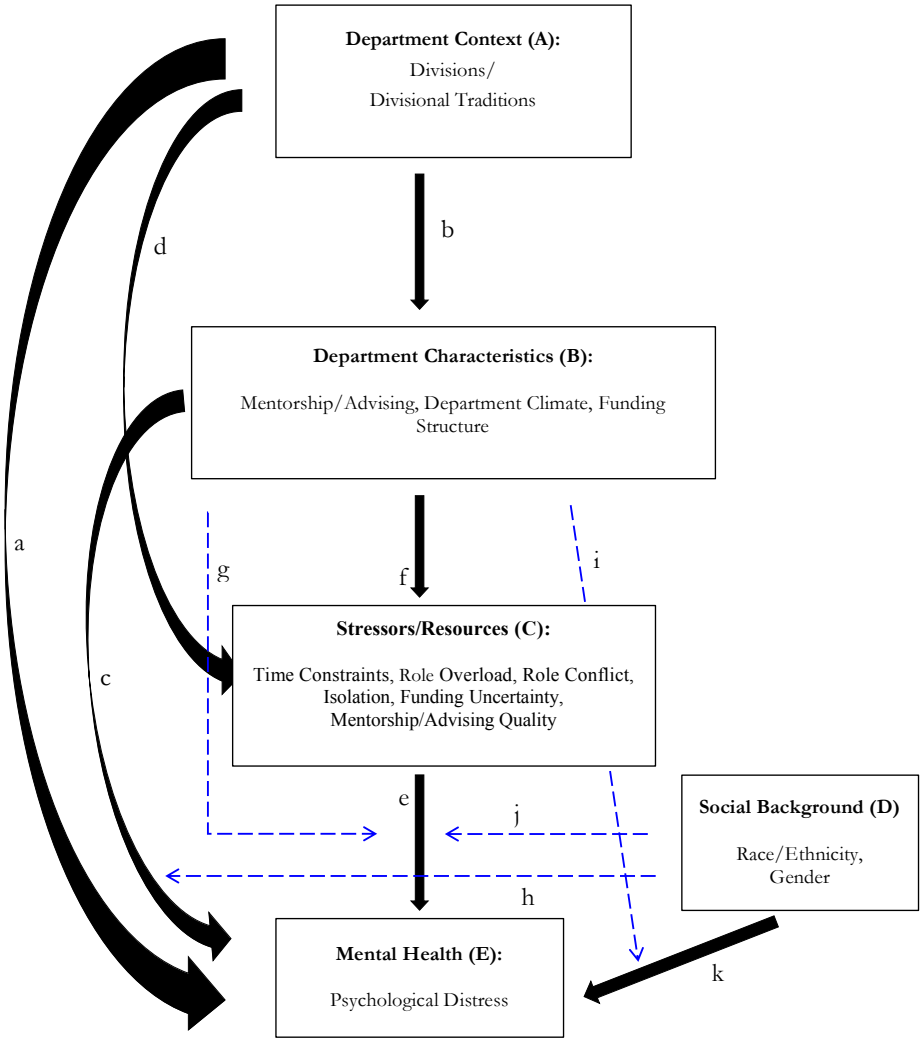
A similar argument can be detailed for understanding the effects of stressors/resources for racial/ethnic minorities as compared to majority students. For example, I anticipate that racial/ethnic minority students will experience greater effects from isolation and poor mentorship/advising quality, compared to their White counterparts, because the threats of tokenism and symbolic racism in academic environments are especially high. That is, because academia mirrors patterns of exclusion in society as a whole, historically excluding racial/ethnic minorities, the effects of isolation and poor mentorship/advising quality for these groups will be greater than their White counterparts. With regard to finances, research from graduate education suggests that racial/ethnic minorities are more likely to depend on personal financial resources (vs. institutional aid) than their White counterparts for their degree completion (Millett 1995). Therefore, one can expect that the effect of financial uncertainty for racial/ethnic minorities will be larger than for their White counterparts. In fact, as racial/ethnic minorities are also more likely to come from low-socio economic backgrounds versus their White counterparts, it is likely that the effect of funding uncertainty on their psychological distress will be greater.

SUMMARY

The purpose of this current project is to explore whether and to what extent the structure of graduate departments influences students' mental health outcomes. I consider the environment of graduate departments especially important for understanding students' mental health experiences because they form unique contexts within which students are socialized into professionals. As such, the characteristics of unique departments (e.g.,

structure of mentorship/advising, department climate and funding structure) require close consideration to determine how they shape stressors, support resources and mental health outcomes of graduate students. Current scholarship in higher education and social psychology has neglected to fully grasp the significance of institutional domains and as such, research on graduate students' mental health lacks information about how students' social locations interact with department contexts, to structure their psychological distress outcomes. This project proposes to address this gap in the literature and empirically examine how graduate students, a relatively homogenous group, come to exhibit differentiable psychological distress outcomes, as a result of structural, social and academic differences between departments. As research on graduate student mental health is relatively limited, I seek to advance both education and mental health scholarship by providing explanatory insight regarding these diverse mental health experiences.

Figure 1.1: Determinants of Graduate Student Mental Health (The Stress Process Model)



CHAPTER TWO:

DATA AND METHODS

In this project, I use a mixed methods approach, combining survey and in-depth interview data to answer my research questions. Quantitative data from the Graduate Student Stress and Coping Survey (GSSC) – described below – are used to test differences in graduate students' psychological distress across divisions (i.e., Arts & Humanities, Social Sciences, Natural & Mathematical Sciences and the Professional Schools), by department characteristics (i.e., mentorship/advising, department climate and funding structure), and stressors/resources (e.g., time constraints, role overload, mentorship/advising, etc.), taking into account students' socio-demographic backgrounds (i.e., race/ethnicity and gender). To acquire department-level data not currently available in the GSSC – namely questions about mentorship/advising and funding structure – I ask graduate department supervisors (via email) and consult department handbooks and websites. For the qualitative component, I conduct in-depth interviews with current graduate students to better understand how and in what ways they contextualize their stress experiences in graduate departments. I devote special attention to the way students perceive their department climate as related to stress, including their social and professional relationships with faculty, colleagues, and those outside academia.

QUANTITATIVE DATA

Quantitative data for this project come from the Graduate Student Stress and Coping Survey (GSSC), which was created and launched by the Mental Health Working Group (MHWG)[4] in Fall 2013.[5] The 60-item survey was created following a thorough review of graduate student mental health literature and pilot focus group interviews during Spring 2012.[6] Identifying the most common themes from the focus group study, the GSSC was created and administered to IUB's graduate student population as a comprehensive mental health survey. For context, IUB can be described as a predominantly white, large, publicly-funded university in the Midwestern United States.[7] The survey was fielded to 9,551 degree-seeking graduate students[8] enrolled at IUB during that semester. More specifically, the target population included any graduate and professional students with an IU email address, enrolled in any degree program at full or part-time status. With assistance from the University Graduate School, the survey was electronically fielded via a series of recruitment emails from early to mid-November 2013. Prospective respondents receiving the recruitment email were invited to participate in a 15-minute survey, which included a chance to win 1 of 3 $50 Visa Gift Cards. The survey was divided into modules including questions on mental health, healthcare utilization (both on- and off-campus), academic background, and social experiences at IUB.

[4] The Mental Health Working Group (MHWG) is a graduate student organization, composed of volunteers from IU Bloomington's Sociology Department. I was co-founder of the organization (created in Spring 2011), and worked alongside colleagues committed to increasing awareness and support for graduate student mental health at Indiana University – Bloomington. We established an environment of mutual support and advocacy at IUB by evaluating mental health needs, facilitating outreach and proposing graduate focused policy reforms.
[5] The IRB Study Number for this project is 1310437752; approved 10/31/2013.
[6] The pilot focus groups included interviews with 17 master's and doctoral students representing various departments at IUB. The interviews examined issues related to graduate student mental health including levels of stress, mental health service awareness and utilization, and coping strategies.
[7] Indiana University Enrollment First Semester 2013-14. (2013, September 6). Retrieved September 9, 2014, from https://www.iu.edu/~uirr/reports/standard/enrollment/.
[8] Although the initial survey sample includes non-degree seeking students, this group is disregarded as it makes up less than 1% of the overall sample and unnecessarily complicates the weighted sampling strategy.

In total, 1,822 graduate students completed the survey: nearly 20% of the degree seeking, graduate student population at IUB. While not atypical in social science research, the relatively low response rate of this survey raises some concern regarding the generalizability of the data. As a result, post-stratification survey weights are applied so that estimates from the data may more accurately reflect the IUB graduate student population. Students who are underrepresented in the data are given greater weight in the statistical analysis to more accurately reflect their true proportion in the graduate student population. Similarly, students overrepresented in the data are given lesser weight in statistical analysis. The specific population dimensions used to construct these weights are graduate student gender, race, and degree type, obtained from IUB's University Institutional Research and Reporting (UIRR) webpage and IUB's online Enrollment Summary Tool.[9] Weighting is conducted along the dimensions of gender, race and degree type, simultaneously, rather than iteratively.[10] That is, cell counts are derived for all unique combinations of students observed in the categories of gender (men and women), race (white, person of color, and international) and degree type (master's and doctoral student), and compared to the population.[11] The average strata size is 130 students; although some combinations yield significantly lower cell counts (e.g., male-person of color-master's student with n=24). Observations in the weighted sample are calculated based on strata membership. Therefore,

[9] Indiana University Enrollment First Semester 2013-14. (2013, September 6). Retrieved September 9, 2014, from https://www.iu.edu/~uirr/reports/standard/enrollment/

[10] It is important to note that while these weights attempt to correct for selection bias, they cannot account for potential discrepancies in enrollment status resulting from differences in the way the enrollment management office and graduate departments characterize and count their students. In particular, some departments admit only to the PhD but require that students earn their MA in the process of degree completion. Those students would likely consider themselves PhD students but would be counted as MA students by enrollment management.

[11] With regard to weighting the sample data, categories adopted for this project reflect official IU reports including the classification of international students as a racial group. Degree type, which is originally divided into three categories (master's, doctoral-research and doctoral-practice), is collapsed into two categories (master's and doctoral) for greater ease.

regarding the parameters of gender, race and degree type, this project is generalizable to the IUB graduate student population.

To examine the research questions outlined at the beginning of this chapter, analyses are restricted to domestic, doctoral students only. The choice to remove international students from the graduate sample was motivated by the unique features that differentiate them from domestic students – including English-language proficiency, socio-economic background, travel and work limitations (in accordance with Visa regulations), etc. As these factors are not captured by the GSSC, their association with students' psychological distress cannot be accounted for. In addition, I focused on the experiences of doctoral students because those in terminal master's programs have a much shorter term (usually 1-2 years) in which to form a professional identity, develop student-faculty relationships, and become acclimated to the department culture. Combining master's and doctoral students would erroneously suggest that their stress exposure (e.g., to financial strain) and training (e.g., in professional socialization) were alike. As data from the GSSC are not longitudinal, studying doctoral students is better suited to understanding the stressors, relationships, resources and stress outcomes that arise within graduate departments. From the original sample of 1,822 students, 616 were domestic, doctoral students. Of these, 51 students were dropped from the analysis because they had missing values on the *k6*, and 25 additional students were dropped because they had one or more missing values on an independent variable of interest. Descriptive statistics for the gender, race and degree type for the unweighted and weighted samples are presented in the Appendix A: Table A2.1.

KEY CONCEPTS

Consistent with the stress process model, I measure graduate student stressors/resources, psychological distress and students' socio-demographic backgrounds. In addition, to capture the institutional context of graduate school, I measure students' enrollment in divisions and capture the respective characteristics of their home department. Eighteen items are utilized from the 60-item GSSC survey to capture these elements – including 1 department context measure, 5 department characteristics, 9 stressors/resources, 3 social background measures and 1 psychological distress outcome. Some key concepts of interest cannot be addressed using the GSSC survey in which case qualitative data are utilized. Key variables from the GSSC are detailed below with descriptive statistics available in Table 2.1.

INDEPENDENT VARIABLES

Department Context:

The GSSC includes measures that capture student enrollment, including open-ended responses to the question "From what IU department(s) will you receive your degree(s)?" which form the *department* variable. For consistency and accuracy, students' responses are collapsed where appropriate (e.g., some respondents entered department names with different spellings and were recoded for consistency throughout; other respondents listed specific programs within larger departments and were recoded to the umbrella department name). 51 departments are categorized in total.[12]

From the *department* variable, responses are recoded according to broad academic divisions, forming the *division* variable (e.g., if a student responded that they were receiving their degree from the Biology department, they were recoded in the *division* variable as belonging to the Natural & Mathematical Sciences). The *division* variable is comprised of 4

[12] While the term "departments" will be used throughout, departments within the Professional Schools are routinely referred to as "Schools" and/or "Programs"

categories (see Table 2.1: Descriptive Statistics): Arts & Humanities (24.6%), Social Sciences (21.1%), Natural & Mathematical Sciences (22.2%), and Professional Schools (32.1%). These designations are consistent with the way Indiana University differentiates students in the graduate school on the Bloomington campus.[13] Table 2.2 shows how departments are collapsed into their respective divisions.

Department Characteristics:

The following GSSC variables are utilized to capture the structure of students' departments regarding mentorship/advising, department climate and funding structure. Some of the department characteristics are coded at the department level (i.e., they have the same value for all students in the department); others are coded at the individual-level based on student perceptions – each are delineated clearly below.

Mentorship/Advising

None of the variables in the GSSC truly captures the structure of mentorship/advising as a department-level characteristic. Therefore, I collected supplementary data on two dimensions of mentorship/advising, to add to the GSSC. The first – *existing program* – captures the presence/absence of a formal mentorship/advising program. A formal program is one in which faculty are paired or matched with incoming doctoral students, often but not necessarily on the basis of communicated substantive interest. To determine whether departments had formal mentoring/advising programs, I first reviewed department websites for information about the doctoral program – most departments had a main webpage with a tab designating the features of its graduate program. When information could not be

[13] For further details, see the UIRR Indiana University Enrollment First Semester 2013-14. (2013, September 6). Retrieved September 9, 2014, from https://www.iu.edu/~uirr/reports/standard/enrollment/

ascertained from department websites, a request for information was sent to a department supervisor, via email. In these instances, I first contacted the Director of Graduate Studies (DGS), and if no response was received within one week, contacted the graduate secretary/coordinator. I asked "Does your department/program offer a formal mentorship/advising program for incoming doctoral students?" From the responses, I created a binary measure (yes vs. no).[14]

The second dimension of mentorship/advising – *student-initiated* – captures the means by which faculty-student mentorship/advising relationships initiate (i.e., assigned or student-initiated). Also a binary measure, responses are coded from the follow-up question, "If yes, is this mentorship/advising program student-initiated (doctoral students are responsible for choosing a mentor/adviser), faculty assigned (faculty members are assigned to incoming students), or other (please explain)? Both are added to the quantitative data as department-level variables. In total, approximately 88% of students come from a department with a formal mentorship/advising program. All students in departments without a formal mentorship/advising program are in the Arts & Humanities.

Department Climate

The GSSC has two variables ascertained directly from students via the survey that help capture the dynamics of department climate, *interaction between faculty and graduate students* and *interaction among graduate students*. Although these do not represent all dimensions of collegiality, they approximate social interaction amongst graduate students and faculty in a given department. *Interaction between faculty and graduate students* asks whether a students' graduate program sponsors events that allow for informal conversation and interaction

[14] Details from the *Department Supervisor Information Request Form* can be found in Appendix B.

between faculty and graduate students, with the possible responses yes (1) or no (0). Similarly, *interaction among graduate students* asks whether a students' graduate program sponsors events that allow for informal conversation and interaction among students, with the possible responses yes (1) or no (0). Although both variables are helpful to assess the extent to which departments value and prioritize interaction between faculty and students, they cannot adequately capture other aspects of department climate – for example, the extent to which the department fosters a social and intellectual community between faculty and students. These remaining aspects, including reciprocal relationships between students and faculty, are addressed by questions in the interviews.

Funding Structure

One variable, ascertained directly from students in the survey, captures funding structure at the department level. *Funding competition* assesses how much (none, a little, some, or a great deal; 0 through 3) competition there is for funding and/or assistantships among students in a department. In addition, two dimensions of funding structure are assessed from department websites, student handbooks and/or via email from department supervisors,[15] to supplement funding competition – *funding package* and *stipend value*. *Funding package*, a binary measure, captures whether a department offers doctoral students a minimum number of years guaranteed funding. However, all departments reported offering their incoming students financial support, of some kind, upon admission. With no variation in *funding package*, the variable was dropped from the dataset and future analysis. *Stipend value* is the 10-month graduate stipend, in thousands of dollars, that students received upon admission to

[15] For details, see *Department Supervisor Information Request Form* (see Appendix B).

the doctoral program.[16] Stipend values were recorded from responses to the question: "What was the average SAA stipend for incoming doctoral students in 2012-2013? (If you do not have figures from 2012-2013, please report the average stipend from the next closest academic year)." The mean stipend value for doctoral students in the survey is 16.0 with a range of 7.63 to 29.0.

Stressors/Resources:

To measure variation in stress exposure across graduate students, nine variables are categorized into six broad stressors/resources: time constraints (1), role overload (1), role conflict (1), isolation (1), funding uncertainty (2), and mentorship/advising (3).

Time Constraints

As the literature suggests, graduate students routinely report experiencing strain as a result of limited time to fulfill responsibilities in academic (e.g., research and teaching) and non-academic life (e.g., maintaining a home) (Grady 2014, Mallinckrodt 1992, Nelson 2001). From the GSSC survey module on students' experiences of burnout and imposter syndrome, time constraints are captured by the question "During the past 30 days, how often have you felt that you do not have enough time to do a good job on work tasks?" Valid responses include "never", "rarely", "sometimes", "often", or "very often"; ranked 0 through 4, with a mean of 2.71.

Role Overload

[16] While stipends are adjusted over time for cost-of-living and inflation, values reported here pertain to the average stipend for each department, given to the incoming doctoral students in Fall 2013.

From the same survey module on burnout and imposter syndrome, students' experiences of overload are captured by the question "During the past 30 days, how often have you felt burned out from graduate school work?" Valid responses are "never", "rarely", "sometimes", "often", or "very often"; ranked 0 through 4, with a mean of 2.46.

Role Conflict

In addition, role conflict, from the same survey module, is captured by the question "During the past 30 days, how often have you felt that your work life and personal life conflict?" Valid responses are "never", "rarely", "sometimes", "often", or "very often"; ranked 0 through 4, with a mean of 2.37.

Isolation

Isolation captures the deleterious effects of seclusion that students may experience while working on independent research. It encompasses the broader experience of remoteness characterizing the nature of doctoral academic work. A 6-item, scaled index (from the GSSC survey) captures this concept by measuring how often (never, rarely, sometimes, often, very often) students feel isolated from family members, friends in graduate school, friends not in graduate school, graduate students in other departments, program faculty or staff, and/or graduate students in their own departments. Responses are aggregated and averaged across the six items to create a composite *isolation* score that ranges from 0 and 4, with a mean of 2.19 and Cronbach's alpha ≈ .92. Since no additional questions in the GSSC tackle the distinction between social, physical and intellectual isolation amongst graduate students (highlighted as an important feature in current literature), the interviews address this in greater depth.

Funding Uncertainty

Two variables, ascertained directly from students on the GSSC, capture students' assessments of financial security throughout their graduate career. First, I capture the financial support students report being offered in their graduate program with the variable *funding guarantee*. *Funding guarantee* asks students whether their offer of admission includes guaranteed multi-year financial support (e.g., grants, scholarships, or stipends), with the possible responses yes (1) or no (0). An additional variable captures students' assessment of their financial support: *funding confidence*. *Funding confidence* asks, "How confident are you that you will have sufficient funds to complete your graduate training?" Response categories include "not at all confident", "not so confident", "confident' and "very confident"; ranked 0 through 3, with a mean of 2.07.

Mentorship/Advising

To ascertain whether doctoral students have a mentor/adviser, students on the survey are asked: "Do you have access to someone in your program that you consider a mentor (e.g., someone who advised you about academic and professional matters beyond your immediate research project(s)?" yes (1) or no (0). If yes, students are prompted to further evaluate the relationship. For students who responded that they had no mentor, they were directed to answer the question "Do you have an academic adviser in your program?" yes (1) or no (0). If yes, they were directed to assess the quality of their advising relationship. Students were filtered into one of three groups regarding *mentorship/advising*: students with a mentor,

students with an adviser, and students with no mentor and no adviser.[17] I dichotomized the mentorship/advising variable into *faculty support* (from an adviser or mentor; 93.5% of students) and *no faculty support* (indicating a student with neither an adviser nor a mentor; 6.5% of students).

Three additional questions assess the quality and content of the relationships between students and faculty. The first two questions ask "Are you satisfied with the quality of the relationship between you and your mentor(s)?", with the valid responses yes (1) or no (0) for those who responded that they have a mentor; and "Are you satisfied with the quality of the relationship between you and your adviser?", with the valid responses yes (1) or no (0) for those who responded that they have an adviser. Consistent with the faculty support measure described above, the responses to satisfaction with mentor/adviser relationships were collapsed into a single dichotomous variable, labeled *satisfied with mentor/adviser*. Valid responses were yes (1) or no (0). Coding a response as yes meant a student was satisfied with either their mentor or adviser, whereas coding a response as no meant a student was dissatisfied with either their mentor or their adviser. One additional 8-item, scaled question addressed the content of advising/mentoring relationships by asking "How much do you agree or disagree with the following?", (0=doesn't apply to my program, 1=strongly disagree, 2= disagree, 3=agree, and 4=strongly agree): My mentor/My adviser: "discusses my questions or concerns", "is someone I could talk to if I were stressed, anxious, overwhelmed, or depressed", "offers support regardless of my career choices", "would go out of his/her way to promote my interests", "gives me clear, unambiguous feedback",

[17] A flaw in the survey design regarding mentorship/advising is that students who had both an adviser and a mentor (or multiple mentors and a primary adviser) could not be distinguished from others. If a student responded affirmatively to the first question (about a faculty mentor), the skip pattern filtered them to evaluate that relationship, but did not circle back to determine whether they also had an adviser. In other words, students could have *either* a mentor or an adviser, or neither. The implications of this oversight are discussed in the limitations section at the bottom of this chapter.

"helps me to plan and complete program requirements and career steps", "helps me to network with others in my field", and "provides direct training or instruction for me". Responses are aggregated and averaged across the eight items to create an index *mentor/adviser content* score, ranging from 0 to 4; with a mean of 2.87 and Cronbach's alpha ≈ .94. Respondents without a mentor/adviser were coded as 0 ="doesn't apply to my program".

Social Background:

Numerous factors characterize students' socio-demographic backgrounds and may influence their respective psychological distress experiences, including race/ethnicity, gender, age, sexual orientation, marital status, household composition, first generation student status, and prior graduate student experience. For the purposes of this project, I am primarily interested in how race/ethnicity and gender influence the effects of department characteristics and/or stressors/resources on students' psychological distress outcomes. Variables I use to capture these elements of social background are *sex* and *race*. In the GSSC, *sex* asks respondents if they identify as male (34%), female (66%) or other (0%), while *race* asks students "How do you usually describe yourself? (please mark all that apply)" and provides seven items from which to choose: "White or Caucasian", "Black or African American", "Hispanic or Latino/a", "Asian or Asian American", "American Indian or Alaskan Native", "Native Hawaiian or Pacific Islander" and "Other (please specify)". Since racial/ethnic minorities represent a small proportion of the total, eligible student population (~10% combined), race is recoded as a dichotomous variable (White and Racial/Ethnic Minority).[18]

[18] For reference, Whites = 90.2%, Blacks or African Americans = 4.2%, Hispanics or Latino/a = 2.3%, Asian or Asian American = 3.8%, American Indian or Alaskan Native = 1.3%, Native Hawaiian or Pacific Islander =

DEPENDENT VARIABLE

Mental Health (E):

Psychological Distress

To assess psychological distress among the graduate population at IU, I employ a screening scale of serious mental illness widely used in needs assessment and health tracking surveys (Kessler 2010). The *k6 scale* is composed of 6 items and was developed by the National Center for Health Statistics to screen for mental illness in the general population. The *k6 scale* has been validated as a measure of the state of mental health in the general population (Kessler 2003). The six survey questions that make up the scale assess how often (0=none, 1=a little, 2=some, 3=most, or 4=all of the time) students have felt nervous, hopeless, restless, depressed, worthless, and that everything was an effort in the last 30 days. Responses are aggregated and averaged across the six items, creating a composite measure *psychological distress*, ranging from 0 to 4; with a mean of 1.36 and Cronbach's alpha ≈ .92.

QUANTITATIVE METHODOLOGICAL APPROACH

This project acknowledges the importance of students' experiences as nested in meaningful clusters within graduate school. In this case, students' academic and mental health experiences are structured by the departments and divisions to which they belong. However, the data were not collected using a cluster sampling technique; therefore, I use an OLS regression modeling approach with the GSSC cross-sectional data. All analyses were conducted in STATA v.14. Listed below is a summary of hypotheses as they pertain to the research questions in this project.

.2%, Other = 2.7%. Proportions add up to more than 100% because graduate students could choose multiple categories.

Models and Hypotheses

Do students' psychological distress outcomes vary by division (i.e., across the Natural & Mathematical Sciences, Social Sciences, Arts & Humanities, and Professional Schools)? If so, is this relationship mediated by department characteristics (i.e., mentorship/advising, funding structure, and department climate)? And by stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty, and mentorship/advising)? To answer this question, I first regress psychological distress on divisions (i.e., Arts & Humanities, Natural & Mathematical Sciences, and Professional Schools) to determine whether there are statistically significant differences in students' mental health. With Natural & Mathematical Sciences as the reference category (largest division in the sample), the coefficients for the Social Sciences and Arts & Humanities are expected to be positive – that is, students in these divisions will have higher psychological distress than those in the Natural & Mathematical Sciences. In addition, I expect the coefficient for the Arts & Humanities to be larger than the coefficient for the Social Sciences – i.e., students in the Arts & Humanities will have the highest psychological distress relative to those in the Social Sciences and Natural & Mathematical Sciences, respectively. I perform post-hoc comparisons to check for other divisional differences.

To determine whether differences across divisions are mediated by department characteristics (i.e., mentorship/advising structure, department climate and funding structure), I use a nested modeling approach to isolate direct and mediated effects. I first regress department characteristics on divisions to look for statistically significant differences in department characteristics by division. I then regress psychological distress on divisions and department characteristics in the same model. Evidence of mediation exists if the

coefficients for divisions become smaller and/or non-significant, relative to the base model. In general, I expect departments in the "hard sciences" – i.e., within the Natural & Mathematical Sciences – to demonstrate more favorable mentorship/advising structures, department climate, and funding structure by virtue of the academic and social norms advanced by "team-based" doctoral training. Differentiated from the "individualized" model, typical of the "soft sciences" – namely the Social Sciences and Arts & Humanities – I expect department characteristics to mediate the relationship between divisions and students' psychological distress. In other words, I expect that unique features in students' home departments are the mechanisms by which divisional differences in distress come about. Therefore, I expect department characteristics to "explain away" variation in psychological distress by divisions.

I estimate comparable models to determine whether stressors/resources mediate variation in students' mental health outcomes, by division. In this project, stressors are the social and academic catalysts for students' experiences of psychological distress – encompassing pressures related to research, teaching, work-life balance, funding, and relationships with colleagues and faculty. Resources are the tools students utilize that may counteract the deleterious effects of stressors. I expect stressors/resources to differentiate models of academic training between the Natural & Mathematical Sciences, writ large, and the Social Sciences and Arts & Humanities, such that differences in exposure to stressors and access to resources, falling along divisional lines, should "explain away" variation in psychological distress by divisions.

To follow, I ask: Does psychological distress vary by department characteristics (i.e., mentorship/advising, department climate, and funding structure)? If so, is this relationship mediated by stressors/resources (i.e., time constraints, role overload/role conflict, isolation,

funding uncertainty, and mentorship/advising)? To determine whether stressors/resources mediate the relationship between psychological distress and department characteristics (i.e., mentorship/advising structure, department climate and funding structure), I use a nested modeling approach to isolate direct and mediated effects. I first regress psychological distress on department characteristics. To follow, I regress stressors/resources on department characteristics. Finally, I regress psychological distress on department characteristics and stressors/resources in the same model. Evidence of mediation exists if the coefficients for department characteristics become smaller and/or non-significant, relative to the base model. Like the hypotheses outlined above, it is possible that stressors/resources "explain away" the relationship between department characteristics and psychological distress. For example, while funding structure (i.e., salary students receive and the extent of competition for funding in a department) is likely an explanatory factor for students' psychological distress, it is possible that stressors/resources explain this distress over and above department characteristics.

In the first moderation model, I ask: Do department characteristics (i.e., mentorship/advising, funding structure, and department climate) moderate the effects of stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty, and mentorship/advising) on psychological distress? To test this relationship, I regress psychological distress on stressors/resources (main effect), including the department characteristics (controls), and include interaction terms for department characteristics with stressors/resources (moderator effects). Stressors/resources are added with their respective moderators (multiplicative terms) in each model. Evidence of moderation exists if multiplicative terms (i.e., interaction effects) are statistically significant. If evidence supports that department characteristics moderate the effects of stressors/resources on psychological

distress, I can conclude that while stressors/resources have direct linear effects on psychological distress, these effects vary at different levels of department characteristics. For example, I expect department climate to moderate the effects of isolation on psychological distress. Specifically, I expect a collegial and interactive department to reduce the impact of isolation, which most doctoral students experience in their graduate careers, on psychological distress. In all, the moderation models here determine whether stressors/resources are influential on psychological distress as department characteristics vary.

Additionally, I ask: Are there differences in the effects of department characteristics (i.e., mentorship/advising, funding structure, and department climate) and stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty, and mentorship/advising) on psychological distress, by gender and race/ethnicity? I regress psychological distress on department characteristics (main effect), include socio-demographic characteristics (i.e., race and gender, as controls), and include interaction terms for department characteristics with socio-demographic characteristics (moderator effects). Independent models are run for each department characteristic, with socio-demographic characteristics added, alongside their respective moderators (multiplicative terms). Evidence of moderation exists if multiplicative terms (i.e., interaction effects) are statistically significant. Consistent with literature on structural inequality and the stress process model, outlined in Chapter 1, I expect the socio-demographic backgrounds of racial/ethnic minorities and women to shape their stress experiences. Due to these marginalized statuses, I expect racial/ethnic minorities and women to benefit more than their counterparts from supportive mentorship/advising relationships, department climate and favorable funding. These models will allow me to determine whether department

characteristics influence psychological distress to varying degrees based on students' socio-demographic background.

I estimate comparable models to determine whether the effect of stressors/resources on mental health outcomes are moderated by gender and race/ethnicity. Evidence of moderation exists if multiplicative terms (i.e., interaction effects) are statistically significant. Similar to the hypotheses outlined above, I expect the impact of stressors/resources to vary by students' socio-demographic backgrounds. For example, given empirical evidence demonstrating the greater burden carried by women to perform caregiving and household duties, relative to men, I expect the impact of role conflict on students' psychological distress to be greater for women than men – particularly if female graduate students struggle to access support resources, because of their marginalized status. In all, these models will allow me to determine whether stressors/resources influence psychological distress differently across students' socio-demographic backgrounds.

Table 2.3 presents the correlation matrix for all variables in the moderation and mediation models, organized by department characteristics, stressors/resources, and the outcome variable (psychological distress). Of the six department characteristics measured in the GSSC – mentorship/advising programs, student-initiated mentorship/advising, interaction with students, interaction with faculty, funding competition, and stipend – all but one have associations with psychological distress in the predicted direction. However, each of these associations is quite weak (between 0 and ±0.3). Mentorship/advising programs ($r = -0.03$), interaction with students ($r = -0.08$), interaction with faculty ($r = -0.09$), and stipend ($r=-0.03$) each have weak, negative associations with psychological distress. In other words, when these department characteristics are present (e.g., mentorship/advising programs) or increase (e.g., interaction with students, interaction with faculty and stipends), psychological

distress decreases, as expected. Student-initiated mentorship/advising, on the other hand, is associated with increased psychological distress (r = 0.03). While this correlation is weak (i.e., close to zero), it is positive, in contrast to my expectations. Amongst the department characteristics, interaction with students and interaction with faculty (both measures of department climate) are positively correlated (r = 0.41). As such, an increase in interaction between students is associated with a moderate increase in interaction between students and faculty. With these measures centering on department-sponsored events, which may provide opportunities for interaction amongst all department members (i.e., faculty, students and staff), it is understandable that these are positively correlated.

As expected, the relationship between each stressor – time constraints, role overload, role conflict, and isolation – and psychological distress, is positive. This indicates that greater exposure to stressors is associated with higher psychological distress. By conventional standards, each of these correlations are moderately strong, ranging from the weakest (role conflict; r = 0.36) to the strongest (role overload; r = 0.56). Additionally, the correlations between stressors are quite strong – primarily between time constraints and role overload (r = 0.45), time constraints and role conflict (r = 0.43), and role overload and role conflict (r = 0.49). While I do not combine them into an index, these variables satisfy the benchmark for a role strain construct.

The four resources measured in the GSSC – funding confidence (r = -0.25), faculty support (r = -0.14), mentorship/advising satisfaction (r = -0.11), and mentorship/advising relationships (r = -0.20) – each have weak correlations with psychological distress, but in the predicted direction. As such, an increase in these resources is associated with a decrease in psychological distress, although far less pronounced than the relationship between stressors and psychological distress (discussed above). Amongst these resources, there is a strong

positive relationship between mentorship/advising satisfaction and mentorship/advising relationships (r = 0.62). This is unsurprising as one would expect higher assessments of the quality of student-faculty relationships to be associated with greater mentorship/advising satisfaction. Additional resource pairings demonstrate weak associations.

QUALITATIVE METHODOLOGICAL APPROACH

Sampling Strategy and Sample Size

While the quantitative data allows me to determine whether institutional dynamics (i.e., academic divisions, department characteristics, etc.) differentiate graduate students' psychological distress, qualitative data complement the analyses by detailing whether, how and to what extent students describe their stress experiences as related to department contexts.

To satisfy the qualitative component of this project, I conducted interviews and one focus group with current graduate students. Interviews are especially well suited for this research study because I seek detail and nuance about students' attitudes (e.g., toward their department) and experiences (e.g., of stress) in graduate school. Interviews illuminate how graduate students feel about the quality and experience of their graduate career. Interviews also allow students to reflect critically on their own department, including the extent to which their department influences their stress experiences, without the pressure of social desirability from other colleagues.

I recruited currently enrolled doctoral students for the interviews and focus group, using a standard recruitment email and attached study information sheet. The recruitment text, which outlined the study parameters and eligibility criteria, is available in Appendix B: Interview Recruitment Text/Focus Group Recruitment Text. In total, two rounds of emails

were sent for the interviews, and recruitment was limited to students in the Social Sciences, Arts & Humanities and Natural & Mathematical Sciences, to better speak to main differences in psychological distress that came out of the quantitative data. The first, to graduate department secretaries, was an invitation to forward the recruitment text and study information sheet to enrolled doctoral students. In this round, emails were sent between Friday April 15th and Friday May 6th, 2016, to 15 departments.[19] In the second round, between Monday May 9th – Monday May 30th, 2016, I contacted organizations directly connected to graduate students – namely, the Graduate and Professional Students' Organization (GPSO), the graduate listserv of Writing Tutorial Services, and the University Emissaries for Graduate Student Diversity, for additional participants. In addition, three study participants offered to send recruitment emails, on my behalf, to their colleagues. In general, interviews were scheduled on a first-come, first-served basis, taking into account an effort to complete a relatively equal number of interviews in each of the broad divisions of interest (i.e., Social Sciences, Natural & Mathematical Sciences and Arts & Humanities). I chose to target graduate organizations in the second round of recruitment, rather than follow-up with specific departments, because the Spring semester had come a close, making it challenging to recruit doctoral students on the whole. Relying on graduate department administrative staff and graduate organizations to help with recruitment allowed me to reach participants in a timely and efficient manner, rather than sending an open call to registered graduate students across the university.

[19] Five departments were chosen at random from an original list of 30 departments in each of the Social Sciences, Arts & Humanities and Natural & Mathematical Sciences, from the GSSC survey sample. Departments contacted via email for the interviews included: From Social Sciences (Linguistics, Anthropology, Criminal Justice, Gender, Economics) from Natural & Mathematical Sciences (Chemistry, Psychological & Brain Sciences, Physics, Statistics, and Biology), and from Arts & Humanities (English, History, Spanish & Portuguese, Religious Studies and Philosophy).

In total, 47 doctoral students contacted me with interest in participating in the research. Of those who expressed interest, three were ineligible, and six contacted me after my interview period had already closed. 38 interviews were scheduled and 32 were conducted.[20] Students were represented well across divisions – 11 students from the Natural & Mathematical Sciences, 8 from the Arts & Humanities, and 12 from the Social Sciences. Table B2.1 and B2.2 summarize the qualitative sample (interview and focus group) in Appendix B. Interview sessions were between 60-90 minutes and scheduled at dates and times amenable to the participants' schedule. With the exception of one interview (conducted at the respondent's home) all interviews were conducted on campus in a private room. All students who scheduled and completed an interview were given a $10 Target Gift Card for their participation.

For the focus group sessions, I intended to conduct two groups with male and female doctoral students who identified as Black/African American, to ensure the experiences of students of color were adequately represented. In this pursuit, I recruited exclusively from the Black Graduate Student Association and through peer networks. Despite my best efforts, only two Black/African American male, doctoral students expressed interest in participating (not enough for a focus group). As a result, I interviewed those participants one-on-one (they are included in the 32 interviews, described above). Six Black/African American female doctoral students expressed interest in participating and were eligible for the study, but only four were able to participate in the focus group, in-person (two from the Social Sciences and two from the Arts & Humanities). Therefore, I scheduled a focus group session with the four women, on campus, at a date and time that worked for our combined schedules. The focus group session was video and audio recorded,

[20] Of the 38 interviews originally scheduled, 6 participants either did not show up for their scheduled interview (and were unable to be reached upon further follow-up) or cancelled their interview and did not reschedule.

and lasted 2 hours and 12 minutes. Each focus group participant was given a $10 Target Gift Card for her time. Unfortunately, with too few focus group participants to explore and compare issues of race/ethnicity in doctoral students' stress experiences, I do not report on these data in this dissertation.

Interviews

At the beginning of each interview, participants completed a student background form with questions about their socio-demographic background and academic standing. (See Student Background Form in Appendix B.) Each form corresponded with a single interview and ensured that participants' information was accurate.[21] Once the form was completed, the interview session began. I used a semi-structured interviewing strategy, with open-ended questions and probes to assess participants' experiences with key research themes, including mentorship/advising, department climate, and isolation. In the interest of parsimony, these themes were captured in the 14 questions below. (See Appendix B: Interview Guide.) I began by asking broad questions about the respondent's division and group/social experiences within their home department (e.g., department climate). Once rapport was established, I asked questions about more personal experiences (e.g., relationships with faculty). In doing so, students first made connections with me on the basis of shared experiences in graduate school, and then answered questions about their individual experiences. All interviews were audio recorded (except for the focus group which was audio and video recorded with the participants' consent), transcribed and coded for key themes.

Key Themes

[21] While interviews were audio recorded, this form ensured that background characteristics not revealed during the interview were available when analysis was conducted.

Three key themes were built into the design of the interviews – mentorship/advising, department climate and isolation. These themes were of primary interest because they, in part, were the weakest areas of the GSSC survey, and because they addressed central foci in my research questions.

Mentorship/Advising

My interest in mentorship/advising was at both the department-level and individual level. At the department-level, I was interested in how mentorship/advising relationships are organized and initiated. At the individual-level, I was interested in the content and quality of these relationships. The GSSC does not adequately capture the "content" of mentorship/advising relationships because it does not assess "fit" between students and faculty, which are of noted importance in higher education literature. With the interview data, I asked students about nuanced and interpretive aspects of their relationships with faculty – for example, whether their faculty mentors/advisers fulfilled the needs/expectations they had of them. By asking these questions, I hoped to learn about the quality of students' experiences with their mentors, including what dimensions of "fit" mattered for them, and what criteria students used to evaluate their satisfaction with faculty mentors/advisers.

Department Climate

With regards to department climate, the GSSC could not help me identify what aspects of "community" (intellectual and social) students experience in their departments. This is fundamental to understanding how department climate functions. Since climate involves much more than mere interaction (the variable available in the GSSC), the interviews

allowed me to make sense of how department climate (a department-level variable) is related to students' experiences. I sought first-hand accounts from students about how their departments created stress and/or provided support for them. Since I conceptualize department-level variables as creating differentiation in students' experiences of stressors/resources, I gained insight about whether students themselves make connections in this manner.

Isolation

Lastly, with regard to isolation – the pitfall of the GSSC is that it doesn't capture nuanced differentiations in the experience of isolation. In fact, it is unclear from the survey how students interpret the term isolation. Because higher education literature places great emphasis on differentiating social, physical and intellectual isolation, these dimensions are captured using the interview data. What I hoped to gain by asking these questions was some sense of whether this distinction is merely "academic" or whether they map on to the way students interpret their own experiences.

Coding Interview Data

During and immediately following each interview, I took note of memorable themes and ideas to begin a list of preliminary codes. These codes began with areas of department climate that the GSSC could not adequately capture but quickly grew to incorporate a range of ideas. Once each interview was conducted and audio recorded, I typed these ideas in an ongoing list. At the end of the data collection period, I procured an external service to transcribe the interviews, checking them for accuracy and making corrections where necessary. I sorted the transcripts by division, and loaded them into Nvivo – a qualitative

software program – to begin coding the themes on my initial list and write brief initial memos (Emerson 1995). I later used emergent coding to review the transcripts and identify recurring ideas. In addition, I used *focused* coding to collapse initial ideas into broader categories and make better sense of emerging themes (Charmaz 2002). When appropriate, I revisited the interview transcripts for more in-depth coding and to identify subcodes (Emerson 1995). A coding legend summarizing the initial and emergent themes in the interviews is included in Appendix B: Table B2.3.

LIMITATIONS

Despite the various strengths of this project, there are two major limitations that require due consideration – sampling/recruitment and measures. First, while invitations for survey participation were sent to all full-time, registered graduate students at IUB (in Fall 2013), there is the potential for selection bias from those who chose to respond. While the quantitative data for the GSSC is weighted by race/ethnicity, gender and degree-type, the sample of students who volunteered to participate may have substantially different stress experiences than those who did not, evidenced by their willingness to participate in a mental health survey. There is no way to account for this selection bias, if it occurred. In addition, analyses from these data are limited in their ability to speak to the experiences of graduate students outside IUB – which is a large, publicly-funded, predominantly white, state school. As such, analysis from this project should be interpreted in its unique context. For example, if this study were conducted with students at a private institution, I would expect financial strain to be less common (and arguably less stressful when it did occur), since students who attend private institutions are more likely to be from privileged socio-economic backgrounds. In this manner, I would expect students at a private or Ivy-league institution to

be better equipped for the financial burdens of doctoral study/research. If this study were conducted in a more diverse geographic locale (e.g., in a major metropolitan city), or an historically black college or university (HBCU), I would expect relationships with faculty (as a resource) to be less consequential for the stress experiences of racial/ethnic minority students. That is, by operating in an academic context which does not magnify their marginalized status, I anticipate that students from racial/ethnic backgrounds would require less support from faculty to move successfully through the program (and experience less stress doing so). More broadly, I would expect students from marginalized backgrounds to experience fewer micro-aggressions and tokenism in their departments, which would manifest in a more welcoming and collegial department climate. Given the importance of department stressors and resources to this research, the stress experiences of students in this study should be understood in their institutional context. For example, the choice to attend IUB for doctoral study may represent a necessity/preference for affordable education, a preference for low-cost living or proximity to family/friends, or other context-specific motivators. As I cannot account for these factors, results do not speak to the varied experiences of students pursuing their doctoral work in different institutional contexts and in substantially differentiable communities.

While I did organize and direct data collection for the GSSC, these data were not collected for the express purpose of this project. As such, two shortcomings prevent the data from being used in an HLM framework, to account for greater similarities within groups (i.e., within departments and divisions) than between groups. First, these data were not collected using cluster sampling with random selection, which is advantageous in HLM to treat each division as a strata, with departments and students as representative cases of the divisions. Secondly, conventional practice suggests these data have too few cases at level-2

(departments) and level-3 (divisions) to be appropriate for HLM (Gelman 2006, Snijders 2005). In best-case scenario, HLM would have allowed me to acquire a higher sample size within the divisions of interest (Natural & Mathematical Sciences, Social Sciences and Arts & Humanities), and remove those in the Professional Schools, since they do not readily adhere to the "hard" vs. "soft" science distinctions. As an alternative to HLM, OLS with robust standard errors was another possibility. Much-like HLM, however, scholars suggest that this approach is best suited to data with large clusters and random sampling within clusters, for which the GSSC data do not qualify (Cameron 2015). Nevertheless, the GSSC represents a comprehensive dataset with modules covering the academic, social and health experiences of a sizeable graduate student population, in a large public university. In this manner, it is a suitable representation of the doctoral student experience. Related to these sampling limitations, the final sample size for analyses in Chapters 3 and 4 are substantially smaller than the original sample, because select students were dropped from the dataset – e.g., terminal master's students, international students, students with missing values on the *k6,* etc. As a result, the original 1,822 students who participated in the survey were reduced to 540, resulting in low statistical power. Additionally, while not an explicit limitation of the analyses presented in Chapters 3 and 4, Table 2.3: Correlations between Variables from Mediation and Moderation Models, demonstrates that the correlations between time constraints, role overload and role conflict could sufficiently warrant a *role strain* construct, which is consistent with the approach of some stress process scholarship and would ease the interpretation of results.

For the qualitative data, while the sampling strategy I used was effective for reaching a target number of interviews, recruitment timing (at the end of Spring semester, in the 2015-2016 academic year) and graduate population dynamics as a whole (IUB being a

predominantly white institution) presented challenges for enrolling racial/ethnic minority students. Most notably, the second focus group I had planned for Black/African American men, was abandoned when I could not acquire enough participants. In addition, it is noteworthy that of the participants who volunteered for the interviews/focus group, very few were late career graduate students.[22] As such, it is important to be cautious of the academic and social experiences that characterize early and mid-career doctoral students (such as transitions into and out of coursework), which are notably different from those of late-career students (such as the job market).

Second, regarding measures, while I attempted to correct and/or amend the crude and incomplete measures of mentorship/advising and funding structure (at the department level), in the GSSC, it is not entirely clear whether the data I collected are valid. By this, I advise caution regarding their assessment because it is unknown how my questions about mentorship/advising programs (as asked to department administrators) were interpreted. My concern primarily stems from the overwhelming number of departments who report having a formal mentorship/advising program (88%), and the 12% of those that do not (all of which are in the Arts & Humanities). Such polarized numbers should be met with due skepticism. Similarly, the measure for funding structure (*funding package* – department level), which was dropped from analysis had no variation whatsoever. That is, all departments reported offering their students a funding package of some kind, upon admission.

Despite these limitations, this project has a number of methodological advantages, including the mixed methods approach with which the research questions outlined earlier are tackled. The quantitative and qualitative data utilized for this project allow for a comprehensive and in-depth look at the social, academic and mental health experiences of

[22] The average time-to-degree completion for a doctoral program is 6.9 years (College Median TTD, 2010-2015). Late-career graduate students (year 4, onward) represent 16% of the total qualitative sample.

an important and understudied population. In addition, the scope of these data and mixed methods approach lend themselves to filling a substantial gap in the research literature regarding how institutional contexts and students' social locations within them, combine to form unique mental health experiences.

Table 2.1: Descriptive Statistics

	% or Mean	SD	Min	Max
Divisions				
Arts & Humanities	24.6%	-	0	1
Professional Schools	32.1%	-	0	1
Natural & Mathematical Sciences	22.2%	-	0	1
Social Sciences	21.1%	-	0	1
Department Characteristics				
Mentorship/Advising Structure				
Mentorship/Advising Program	87.96%	-	0	1
Mentorship/Advising Program Organization				
Student-initiated	33%	-	0	1
Faculty-assigned	67%	-	0	1
Department Climate				
Interaction between students	0.80	0.40	0	1
Interaction with faculty	0.73	0.45	0	1
Funding Structure				
Funding Competition	1.62	1.07	0	3
None	18.46%	-	0	1
A little	27.78%	-	0	1
Some	27.06%	-	0	1
A great deal	26.70%	-	0	1
Stipend (in thousands)	16.01	3.00	7.63	29.0
Stressors/Resources				
Time Constraints	2.71	1.12	0	4
Never	2.43%	-	0	1
Rarely	13.74%	-	0	1
Sometimes	25.39%	-	0	1
Often	27.48%	-	0	1
Very Often	30.96%	-	0	1
Role Overload	2.46	1.21	0	4
Never	5.57%	-	0	1
Rarely	17.22%	-	0	1
Sometimes	29.39%	-	0	1
Often	21.22%	-	0	1

Very Often	26.61%	-	0	1
Role Conflict	2.37	1.26	0	4
Never	8.17%	-	0	1
Rarely	18.09%	-	0	1
Sometimes	27.65%	-	0	1
Often	21.04%	-	0	1
Very Often	25.04%	-	0	1
Isolation	2.19	0.82	0	4
Funding Guarantee	77.04%	0.42	0	1
Funding Uncertainty/Confidence	2.07	0.91	0	3
Not at all confident	7.66%	-	0	1
Not so confident	15.33%	-	0	1
Confident	39.57%	-	0	1
Very confident	37.43%	-	0	1
Mentorship/Advising Quality				
Faculty Support (Mentor/Adviser)	93.5%	-	0	1
No Faculty Support	6.5%	-	0	1
Satisfied with Mentor/Adviser	68.0%	0.47	0	1
Mentor/Adviser Score	2.87	0.58	1	4
Socio-Demographic Variables				
Race/Ethnicity (%)				
White/Caucasian	90.37%	-	0	1
Racial/Ethnic Minority	9.63%	-	0	1
Sex (%)				
Female	66.06%	-	0	1
Male	33.94%	-	0	1
Age	29.67	6.45	22	65
Outcome Variable				
Psychological Distress	1.36	0.82	0	4
N	540			

Table 2.2: Departments Collapsed into Divisions

Arts & Humanities	**Social Science**	**Natural & Mathematical Sciences**	**Professional Schools**
Philosophy	Sociology	Biology	Music
American Studies	Economics	Chemistry	Musicology
English	Political Science	Psychological and Brain Sciences	Music Theory
History	Geography	Physics	Music Education
Folklore and Ethnomusicology	Criminal Justice	Geological Sciences	Optometry
Communication and Culture	Gender Studies	Math	Kinesiology
History of Art	Anthropology	Molecular and Cellular Biochemistry	Education
Central Eurasian Studies	Linguistics		Curriculum and Instruction
Religious Studies	Second Language Studies		Educational Leadership and Policy Studies
Theatre, Drama and Contemporary Dance	Telecommunications		Literacy, Culture and Language Education
Near Eastern Languages and Cultures			Instructional Systems Technology
French and Italian			Counseling Education and Psychology
Spanish and Portuguese			Public Health
			Applied Health Science
			Epidemiology and Biostatistics
			Informatics
			Information and Library Science
			Business
			Journalism
			Recreation, Park, and Tourism Studies
			Computer Science

Table 2.3: Correlations between Variables from Mediation and Moderation Models

Independent Variables	*Men/Adv Program*	*Student-initiated Men/Adv*	*Interaction with students*	*Interaction with faculty*	*Funding Competition*	*Stipend*	*Time Constraints*	*Role Overload*	*Role Conflict*	*Isolation*	*Funding Confidence*	*Faculty Support*	*Men/Adv Satisfaction*	*Men/Adv Relationship*	*Psychological Distress (k6)*
Department Characteristics															
Mentorship/Advising Program	1.0	*	-0.06	0.003	0.01	0.11	-0.08	0.01	-0.08	-0.02	0.08	0.19	-0.01	-0.02	-0.02
Student-initiated Mentorship/Advising	*	1.0	-0.06	-0.07	0.02	0.21	-0.04	-0.01	-0.04	0.001	-0.01	-0.03	0.10	0.04	0.03
Interaction with students	-0.06	-0.06	1.0	0.41	0.001	0.05	-0.09	-0.06	-0.09	-0.20	0.20	0.08	0.05	0.13	-0.08
Interaction with faculty	0.003	-0.07	0.41	1.0	0.01	-0.01	-0.04	-0.07	-0.09	-0.16	0.11	0.14	0.10	0.16	-0.09
Funding Competition	0.01	0.02	0.001	0.01	1.0	-0.07	-0.22	0.15	0.08	0.18	-0.27	0.06	-0.09	-0.10	0.14
Stipend (in thousands)	0.11	0.21	0.05	-0.01	-0.07	1.0	-0.10	-0.04	-0.08	-0.08	0.24	0.06	0.06	-0.03	-0.03
Stressors															
Time Constraints	-0.08	-0.04	-0.09	-0.04	-0.22	-0.10	1.0	0.45	0.43	0.29	-0.22	-0.10	-0.14	-0.13	0.42
Role Overload	0.01	-0.01	-0.06	-0.07	0.15	-0.04	0.45	1.0	0.49	0.32	-0.22	-0.03	-0.11	-0.17	0.52
Role Conflict	-0.08	-0.04	-0.09	-0.09	0.08	-0.08	0.43	0.49	1.0	0.30	-0.17	-0.01	-0.15	-0.16	0.36
Isolation	-0.02	0.001	-0.20	-0.16	0.18	-0.08	0.29	0.32	0.30	1.0	-0.26	-0.10	-0.28	-0.28	0.43
Funding Confidence	0.08	-0.01	0.20	0.11	-0.27	0.24	-0.22	-0.22	-0.17	-0.26	1.0	0.02	0.13	0.14	-0.25
Faculty Support	0.19	-0.03	0.08	0.14	0.06	0.06	-0.10	-0.03	-0.01	-0.10	0.02	1.0	*	*	-0.14
Mentor/Adviser Satisfaction	-0.01	0.10	0.05	0.10	-0.09	0.06	-0.14	-0.11	-0.15	-0.28	0.13	*	1.0	0.62	-0.11
Mentor/Adviser Relationship	-0.02	0.04	0.13	0.16	-0.10	-0.03	0.13	-0.17	-0.16	-0.28	0.14	*	0.62	1.0	-0.20
Outcome Variable															
Psychological Distress (k6)	-0.03	0.03	-0.08	-0.09	0.14	-0.03	0.42	0.52	0.36	0.43	-0.25	-0.14	-0.11	-0.20	1.0
N	540														

* No correlation available

CHAPTER THREE:

DESCRIBING AND EXPLAINING DIFFERENCES IN DISTRESS BY DIVISION

INTRODUCTION

In this chapter, I ask four questions: (1) Do students' mental health outcomes vary by division (i.e., across the Natural & Mathematical Sciences, Social Sciences, and Arts & Humanities)? (2) To what extent are these differences mediated by department characteristics (i.e., by mentorship/advising, department climate, and funding structure) and by stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty, and mentorship/advising quality)? (3) Does psychological distress vary by department characteristics (i.e., mentorship/advising, department climate, and funding structure)? And (4) To what extent are these differences mediated by stressors/resources (i.e., time constraints, role overload/role conflict, isolation, funding uncertainty, and mentorship/advising quality)? My hypotheses about the psychological distress outcomes of graduate students are motivated by literature in higher education regarding divisional differences in doctoral training – including differences in scientific rigor, research standards, professional norms and the like. I expect differences in students' psychological distress to be linked to the "research-team" and "individualized" models of doctoral training, consistent with "hard" and "soft" science distinctions. However, empirical studies emphasize the importance and variability of department features, such as student-faculty relationships, department climate and funding, which may also influence students' psychological distress experiences, above and beyond division membership. Lastly, the stress process model, emphasizing sources of stress and the utility of assets, highlight the circumstances and

resources that shape students' psychological distress outcomes, beyond division membership. These relationships are outlined and examined below, with analyses in the section that follows.

HYPOTHESES

I hypothesize that psychological distress will vary across divisions due to key differences in department/program organization. Namely, I hypothesize that students' psychological distress will differ by the "research-team" and "individualized" models of doctoral training that occur within the Natural & Mathematical Sciences as compared to the Social Sciences and Arts & Humanities. Specifically, because the "research-team" model facilitates training, mentorship/advising and funding, I hypothesize that graduate students in the Natural & Mathematical Sciences, as compared to the Social Sciences, Arts & Humanities and Professional Schools, will experience less distress. In contrast, students in the Social Sciences and the Arts & Humanities will experience greater psychological distress consistent with the "individualized" training model utilized in those divisions.

The question follows whether the relationship between divisions and students' psychological distress is mediated by department characteristics – namely, mentorship/advising, department climate, and funding structure. Regarding mentorship/advising, scholars suggests that because of the "research-team" model, it is not uncommon for doctoral students in STEM fields (i.e., the Natural & Mathematical Sciences) to be paired with an adviser/mentor before starting their program and/or immediately after, based on substantive/project interests. In contrast, in the "individualized" model, more common in the Social Sciences, graduate students largely bear the personal responsibility for initiating mentorship/advising relationships (Delamont 1999, Phillips 1979).

Mentorship/advising in the Arts & Humanities follows an "individualized" model as well, in that it is routinely initiated by the student and considered a disciplinary norm for the success of graduate students engaged in doctoral work (Phillips 1979).

Due to differences in power and status between faculty and students, I expect these distinct means of initiating mentorship/advising relationships to influence graduate students' mental health outcomes. In fact, independent of differences by division, relationships with faculty are challenging to navigate for graduate students, and therefore impact students' psychological distress outcomes. As graduate students are new members of academic and professional communities, doctoral training is much-like an apprenticeship under the guidance of faculty (Delamont 1999, Rose 2005). In this manner, initiating and navigating relationships with mentors/advisers may be challenging for students because the professional norms, personalities and mentorship/advising styles of faculty are not typically known at the outset. Further, graduate students routinely feel insecure in their academic identities as a result of their social locations – neither fully professionals, nor novices – making it difficult to navigate the power and status differential between themselves and faculty (Grady 2014, Rose 2005). Therefore, I hypothesize that doctoral students will experience higher psychological distress in departments where mentorship/advising relationships are student-initiated – compared to departments with assigned supervision. That is, I expect students who "brave" the distance between themselves and faculty to experience greater psychological distress in establishing mentorship/advising relationships, than their counterparts. However, the existence of mentorship/advising programs, writ large, can be a tremendous resource for helping students meet their social and academic needs. As such, I expect students in departments without a mentorship/advising program, albeit rare, to experience the highest psychological distress relative to all other students.

Overall, given divisional differences in student-faculty relationships, and the relationship between mentorship/advising and psychological distress, mentorship/advising is a plausible mediator for the association between divisions and psychological distress.

I hypothesize that department climate, characterized by the nature of social and professional relationships between faculty and graduate students (i.e., the level of collegiality in a department), will mediate the relationship between divisions and doctoral students' psychological distress. Higher education literature describes the "research-team" model, typical in the Natural & Mathematical Sciences, as contributing to a department context that is more cooperative than competitive, relative to the Social Sciences and Arts & Humanities (Delamont 1999). In part, competition in the "individualized" model may be related to the process of selecting and securing a mentor/adviser, as discussed above. Competition may be especially pronounced when the faculty to student ratio is skewed, or faculty members are in demand (Delamont 1999). In contrast, although some labs will be in greater demand than others in the Natural & Mathematical Sciences, the "research-team" model, and the frequency with which lab rotations take place, may diminish tension between graduate students, and may even facilitate a network of student-faculty relationships. Independent of divisional differences, however, department climate will be linked to students' psychological distress. As a resource, a supportive department climate provides students with positive relationships with colleagues and faculty, which they can draw upon to overcome academic and social challenges. In this manner, a collegial and supportive department climate should lower students' psychological distress, and vice versa. Therefore, I expect departments that employ the "research-team" model (i.e., primarily in the Natural & Mathematical Sciences) to establish a collaborative climate where students feel more support than their Social Science and Arts & Humanities counterparts, reducing psychological distress. Meanwhile, in

departments within the Social Sciences and Arts & Humanities, which may exhibit more competitive/conflicted department climates (i.e., under the "individualized" model), students will exhibit higher psychological distress.

The structure of department funding may also mediate the relationship between divisions and psychological distress. By funding structure, I mean (1) whether there is a department offer of financial support for incoming students, (2) students' 10-month stipend values and (3) students' assessments of funding competition. For example, in the Natural & Mathematical Sciences, the "research-team" model is directly linked to the acquisition and permanence of research funding for ongoing projects, which keeps research teams in business. In the Social Sciences, the "individualistic" model explains the lesser continuity in funding for research projects, relative to students in the Natural & Mathematical Sciences (Delamont 1999). In addition to these differences, on average, students in the Natural & Mathematical Sciences are paid more than their Social Science counterparts, both in graduate school and in later academic careers. While little comparative research includes the structure of funding in the Arts & Humanities, it is noteworthy that these graduate students, on average, earn less than their Social Science and Natural & Mathematical Science counterparts (Becher 1989). I anticipate that funding structure – i.e., whether guaranteed financial support accompanies an admissions offer, the monetary value of that financial support, and the level of funding competition in a department – will influence students' psychological distress (Golde 2005). Specifically, I expect that students' psychological distress will be lower when departments make a concerted effort to provide a living wage (i.e., a minimum income necessary for students to meet their basic needs), and eliminate competition for funding between students (e.g., by providing guaranteed financial assistance to as many students as possible). As noted earlier, financial support may be tied to the "team-based" or

"individualistic" models typical of the broad division; however, empirical evidence from a wide range of departments suggests that guaranteed funding, to a greater or lesser extent, is relatively common among doctoral students (Golde 2005). In this manner, I expect funding to mediate the relationship between divisions and psychological distress.

Similar to the hypotheses outlined above, I also propose that stressors and resources may mediate the relationship between divisions and students' psychological distress – specifically, time constraints, role overload, role conflict, isolation, funding uncertainty and mentorship/advising quality. It is well documented in the literature that graduate students experience pronounced stress regarding time management and the fulfillment of academic responsibilities. These experiences are best captured by the notion of *time constraints* – i.e., the extent to which students do not have enough time to fulfill various academic and non-academic responsibilities. Understandably, when responsibilities central to the academic success of doctoral students outweigh available resources of time, students will become distressed. In divisions such as the Natural & Mathematical Sciences, where the pressure to publish and present academic work coincides with especially long work weeks (it is not uncommon for students to spend 40+ hours per week in lab), graduate students may experience significant time constraints. However, graduate students in the Social Sciences and Arts & Humanities, subject to similar publication and presentation standards, may experience greater time constraints from the accompanied demands of teaching. While teaching is an option for students in the Natural & Mathematical Sciences, it is instrumental and expected of doctoral students in the Social Sciences and Arts & Humanities, in preparation for later academic careers. In addition, it is often the primary source of funding for students in the Social Sciences and Arts & Humanities to cover living expenses, as grant and scholarship funding is less common than for their counterparts. Combined with the

lower pay for students in the Social Sciences and Arts & Humanities, I expect time constraints to mediate the relationship between divisions and students' psychological distress.

Role overload and role conflict are closely related – like time constraints incurred throughout degree completion, graduate students may find themselves overwhelmed with academic tasks and privilege them at the expense of work-life balance. Further, the balance between a rigorous academic schedule and numerous non-academic responsibilities may be exacerbated by competing and/or conflicting demands, such as the pressure to privilege research (from advisers) and teaching (from students), both of which are required to successfully fulfill the responsibilities of an academic. As the "soft sciences" are structured in a manner that links students' funding to teaching obligations and assistantships, much more so than in the "hard sciences", I hypothesize that students in the Social Sciences and Arts & Humanities will experience greater role overload and role conflict than their Natural & Mathematical Science counterparts.

I expect that isolation will be less common in the Natural & Mathematical Sciences than in the Social Sciences, since social support is built-in to the "research-team" framework. With differences in isolation directly related to the structure of doctoral study in the "hard" and "soft" sciences, I expect that isolation, as a stressor, will mediate the relationship between divisions and psychological distress.

My hypothesis regarding funding, as a resource, is that due to substantial differences in pay and future job prospects, students in the "hard" sciences, such as those in the Natural & Mathematical Sciences, will feel less stressed about having enough financial support to cover living expenses and complete their degree, than students in the "soft" sciences (such as those in the Social Sciences and Arts & Humanities). As a result, I expect that differences in

psychological distress across divisions may be explained by differences in funding confidence.

Lastly, I hypothesize that mentorship/advising (as a resource) mediates the relationship between divisions and psychological distress, because the quality and content of student-faculty relationships will fall in line with the training models implemented in doctoral departments. For example, in divisions that utilize the "research-team" model, doctoral students will be more likely to have faculty mentors and advisers, and benefit from the social support of these relationships. In other words, because early student-faculty relationships are characteristic of departments that utilize the "research-team" model, this will translate into students' greater likelihood of having relationships with faculty and their favorable assessments of faculty relationships, relative to students in departments using the "individualized" model. As such, I expect mentorship/advising to mediate the relationship between divisions and psychological distress, as it will explain the lower distress scores of students in the Natural & Mathematical Sciences versus their Social Science counterparts.

As hypotheses for the association between department characteristics and psychological distress are outlined above, I test whether these relationships are mediated by stressors and resources. I suggest that students' proximate sources of stress may override the influence of department characteristics on mental health outcomes. For example, student-initiated mentorship/advising relationships are expected to be associated with higher students' psychological distress. It is possible, however, that faculty support, satisfaction with one's mentor/adviser, and the quality and content of relationships with faculty, explain the influence of the mentorship/advising program as a whole – i.e., the means by which student-faculty relationships originate – on students' psychological distress. Whereas department climate, time constraints, role overload and isolation may mediate the relationship between a

supportive and collegial environment and students' psychological distress. To illustrate, consider if students' research takes them away from the social and intellectual community of their departments – such as in the process of data collection, or in the period immediately following coursework completion. This isolation may mediate the relationship between an overall supportive and collegial department climate and students' psychological distress. With funding structure, larger stipends and less funding competition are expected to be associated with lower students' psychological distress. However, these may be mediated by experiences of role overload, role conflict, isolation, and faculty support. For instance, the psychological distress students experience from feeling overwhelmed by teaching, research and service obligations, which vary considerably over the graduate career, may outweigh their struggle to meet financial needs on a graduate stipend. In fact, the variability of coinciding program and daily life demands may, in general, outweigh the stress students experience from fixed, though arguably insufficient, funding. As such, it is possible that stressors/resources, and those outlined above specifically, mediate the relationship between funding structure and psychological distress.

In all, I expect that immediate sources of stress may mediate the influence of department characteristics on students' psychological distress. The measures capturing these relationships are outlined in the section that follows.

METHODS

The following variables capture the divisions, department characteristics, stressors and resources, and psychological distress measures used in the mediation models (for further details on measures, see Chapter 2: Data and Methods). The variable *divisions* categorizes 55 academic departments into four broad distinctions: Natural & Mathematical Sciences, Social

Sciences, Arts & Humanities, and the Professional Schools (to see the proportion of students in each division, see Chapter 2, Table 2.1).

Department characteristics are captured in three meaningful areas: mentorship/advising, department climate and funding structure. Two binary variables capture mentorship/advising relationships at the department level; *existing program* which measures the presence and/or absence of a formal mentorship/advising program in a doctoral department, and *student-initiated program* which measures the means by which faculty-student mentorship/advising relationships originate. Department climate is captured with two additional, binary (yes/no) variables; *interaction with faculty* measures whether the academic department sponsors events that allow for informal conversation and interaction between faculty and graduate students; and *interaction with students* measures whether the academic department sponsors events that allow for information, conversation and interaction among students. For funding structure, two variables are captured at the departmental level;[23] *funding competition* is a scaled measure assessing how much competition for funding/assistantships there is among students in a doctoral program (from 0=none to 3 = a great deal), and *stipend,* is a ratio-level variable capturing the dollar value of students' annual, doctoral funding.

Seven additional variables capture the stressors that fall into six broad categories: role overload, role conflict, isolation, funding uncertainty, and mentorship/advising quality. *Time constraints, role overload, role conflict and isolation,* are measured on the same scale (ranging from 0= never to 4= very often), indicating how often students have experienced each stressor in the past 30 days. Two variables measure funding uncertainty as a stressor; the first, a binary variable *funding guarantee*, asks students whether their offer of admission into a doctoral

[23] As a reminder, funding structure was originally three variables, but *funding package* was removed as there was not enough variation across students and divisions to isolate meaningful results.

program included guaranteed, multi-year financial support. The second, *funding confidence*, is a four-point scale asking students how confident they feel that their funding will be sufficient to complete graduate training (responses range from 0=not at all confident to 3=very confident).

Three additional variables capture mentorship/advising quality as a resource. The first, *faculty support,* is a binary measure distinguishing students who report having an adviser or mentor, from those who do not. As a complement, the binary measure *mentor/adviser satisfaction* captures the extent to which students reflect favorably on the quality of their relationship with a mentor or adviser. Finally, *mentor/adviser relationship* measures the content of student-faculty relationships by assessing how much students agree or disagree with a series of statements about faculty support (responses range from 1=strongly disagree to 4=strong agree).[24] The outcome measure for all mediation models, unless otherwise specified, is psychological distress, captured by the *k6*, a screening scale of mental illness validated as a measure of mental health in the general population (Kessler 2003).

RESULTS

Differences in Psychological Distress Across Divisions

I test for base differences in psychological distress by division using OLS regression. As a reminder, the students in this sample are full-time, domestic (i.e., US citizens), doctoral students in the Arts & Humanities, Natural & Mathematical Sciences, Professional Schools, and Social Sciences. Higher scores on the *k6* – psychological distress scale – indicate greater distress (i.e., poorer mental health), while lower scores indicate less distress (i.e., better mental health) (Kessler 2003). As evidenced by Table 3.1 (in the base model with controls),

[24] Students who indicated that this question did not apply to their program were assigned a score of 0.

while students in the Social Sciences are more distressed than their Natural & Mathematical Science counterparts ($\beta=0.21$, $p<0.05$), as predicted, there are no statistically significant differences between the psychological distress of students in the Arts & Humanities and the Professional Schools, compared to those in the Natural & Mathematical Sciences. There are also no significant differences in distress across the other divisions.[25] In addition, consistent with scholarship in the epidemiological literature, females have higher distress than their male counterparts ($\beta=0.17$, $p<0.05$). In contrast, whites have lower distress than their racial/ethnic minority counterparts (marginally; ($\beta=-0.20$, $p<0.10$).

Explaining Differences in Distress by Division

To evaluate mediation, I first regress the mediator on divisions, with controls to determine whether the mediators vary by division. Second, I regress psychological distress on divisions and the mediator, with controls. In this last step, I compare coefficients and p-values to the base model, seeking confirmation that any original relationship between divisions and psychological distress approaches and/or becomes non-significant with the addition of the mediator.

Department Characteristics as Mediators

In the analyses that follow, I present a table for divisional differences in psychological distress (Table 3.1), tables for divisional differences in department characteristics (Table 3.2) and stressors/resources (Table 3.4), followed by tables for divisional differences in psychological distress with department mediators (Table 3.3) and stressor/resource mediators (Table 3.5). Results are discussed one mediator at a time.

[25] Divisional differences in distress were verified using post-hoc comparisons.

Mentorship/Advising

While I expected mentoring/advising to vary by "hard' and "soft" science distinctions, approximately 88% of all doctoral students reported having a formal mentorship/advising program in their department. Further, the 12% of students (n=65) who reported not having a mentorship/advising program were all in the Arts & Humanities. Because the mentorship/advising program variable is collinear with divisions, I cannot evaluate its role as a mediator of distress differences by division.[26]

In Table 3.2, I evaluate divisional differences in the second mentorship/advising variable, *student-initiated,* which addresses how mentorship/advising relationships arise (i.e., student initiated vs. faculty assigned). In Table 3.2, there are divisional differences in the extent to which students report initiating relationships with faculty, but those differences are not consistent with my hypotheses. Whereas I believed student-initiated mentorship/advising relationships would be more common in the "soft" sciences, according to Model 1, students in the Natural & Mathematical Sciences are more likely than those in other divisions to initiate relationships with faculty. With coefficients represented as odds ratios, students in the Arts & Humanities have approximately 65% lower odds than their Natural & Mathematical Science counterparts of initiating mentorship/advising relationships with faculty (OR=0.35, $p<0.001$). Similarly, students in the Social Sciences (OR=0.16, $p<0.001$) and Professional Schools (OR=0.37, $p<0.000$) have 84% and 63% lower odds of

[26] In this model, divisions were being dropped by STATA because of (multi)collinearity.

student-initiated mentorship/advising relationships than those in the Natural & Mathematical Sciences, respectively.[27]

As a reminder, I hypothesized that students responsible for initiating mentorship/advising relationships with faculty would experience greater psychological distress. In Table 3.3, I evaluate whether *student-initiated mentorship/advising* mediates the relationship between divisions and psychological distress. The base model presents the association of divisions with distress net of sex, age, and race. Model 1 adds student-initiated mentorship/advising to the base model. The coefficient for social sciences does not become smaller with the introduction of student-initiated mentorship/advising (β=0.24, $p<0.05$). In fact, the coefficient becomes slightly larger. This indicates that, if anything, advising suppresses rather than mediates divisional differences in distress. In sum, mentorship/advising relationships, both their presence and the conditions under which they arise, do not mediate the relationship between divisions and students' psychological distress.

Department Climate

In Tables 3.2 – 3.3, I test the hypothesis that department climate mediates the relationship between divisions and psychological distress. First, Table 3.2 demonstrates that compared to the Natural & Mathematical Sciences, students in the Professional Schools are less likely to have department sponsored events allowing interaction between graduate students (OR=0.45, $p<0.01$); while students in the Arts & Humanities and Social Sciences show no discernable differences from their Natural & Mathematical Sciences counterparts. It is worthwhile to note that while Biglan (1973), did not develop particular hypotheses about

[27] In addition, students in the Social Sciences have 54% lower odd of student-initiated mentorship/advising relationships compared to those in the Arts & Humanities, and 67% lower odds of student-initiated mentorship/advising relationships compared to those in the Professional Schools.

students in the Professional Schools, he did suggest that social connectedness was especially important to the hard sciences by virtue of team-based lab settings. As such, I expected a statistically significant difference in *interaction with graduate students* between the Natural & Mathematical Sciences and the Social Sciences, which there is not (OR=1.02, p=0.95).

Since *interaction with graduate students* is not a significant predictor of divisional differences between students in the Natural & Mathematical Sciences and their Social Science counterparts, it is unsurprising that it does not mediate the relationship between divisions and psychological distress (Table 3.3, Model 2). In fact, while being in a department/program that supports interaction between graduate students marginally reduces students' psychological distress (β=-0.17, p=0.07), it does not explain differences in distress between students from the Natural & Mathematical Sciences and their Social Science counterparts. Specifically, the divisional difference in psychological distress between students in the Natural & Mathematical Sciences and their Social Science counterparts does not change – i.e., it remains significant (Model 1, β=0.22, p<0.05). Overall, *interaction with graduate students* is a predictor of psychological distress such that greater interaction with peers as a result of department-sponsored events is associated with lower distress for doctoral students. In addition, there are some meaningful differences in *interaction with graduate students* across divisions (namely between students in the Natural & Mathematical Sciences and the Professional Schools), however; this interaction does not explain differences in students' psychological distress across divisions.

Regarding the second measure of department climate – *interaction with faculty* – the story is quite similar. I test the hypothesis that departments hosting events allowing for informal conversation and interaction between faculty and graduate students mediates the relationship between academic divisions and students' psychological distress. However,

unlike *interaction with graduate students,* there are no significant differences between divisions regarding *interaction with faculty* (Table 3.2, Model 3). In other words, there are no meaningful differences in the way departments/programs across divisions sponsor events that allow for students to interact with faculty. Therefore, while Table 3.3, Model 3 shows evidence of a marginally significant association between *interaction with faculty* and psychological distress (β=-0.14, p=0.07), interaction with faculty is not a mediator of the relationship between divisions and psychological distress. That is, while interaction with faculty may reduce students' psychological distress, departments across divisions sponsor events of this kind to a relatively similar extent, and the lower psychological distress scores of students in the Natural & Mathematical Sciences versus the Social Sciences, cannot be explained by it (β=0.21, p<0.05). Next, I outline hypotheses for the mechanisms by which the structure of department funding may mediate the relationship between divisions and students' psychological distress.

Funding Structure

As Table 3.2, Model 4 demonstrates, there are meaningful differences across divisions in students' stipends, as expected. Specifically, students in the Social Sciences (β=-4.67, p<0.001), Professional Schools (β=-2.53, p<0.001), and Arts & Humanities (β=-3.20, p<0.001) earn less than their Natural & Mathematical Science counterparts. Nevertheless, stipend values are not a significant predictor of psychological distress for doctoral students (β=-0.01, p=0.41)[28] when controlling for sex, age and race. As such, Table 3.3, Model 4 confirms that stipend values do not mediate the relationship between divisions and psychological distress.

[28] This analysis is not shown.

I follow this analysis by detailing mediation models for the second indicator of funding structure – *funding competition. Funding competition* captures how much (none, a little, some or a great deal) competition for funding and/or assistantships students perceive in their department/program. Table 3.2, Model 5 demonstrates that students in the Professional Schools report greater funding competition than their Natural & Mathematical Science counterparts (β=0.33, $p<0.01$). However, no other paired differences by division in funding competition yield significant relationships. This includes no evidence of divisional differences in funding competition between students in the Social Sciences and their Natural & Mathematical Science counterparts, as expected. While Table 3.3, Model 5 provides evidence that greater funding competition is associated with greater psychological distress (β=0.10, $p<0.01$), there is no evidence of mediation in the relationship between divisions and psychological distress, from funding competition – i.e., base divisional differences in distress are unchanged (β=0.21, $p<0.05$).

Individual Level Stressors and Resources as Mediators

Much like the hypotheses outlined above, I also argue that stressors and resources may mediate the relationship between divisions and students' psychological distress – specifically, time constraints, role overload, role conflict, isolation, funding uncertainty and mentorship/advising quality.

Time Constraints

Table 3.4, Model 1 suggests that there is differentiation in the time constraints that students in the Arts & Humanities (β=0.29, $p<0.05$) and Social Sciences (β=0.26, $p<0.10$) experience, relative to the Natural & Mathematical Sciences. Specifically, students in the "soft sciences"

report greater time constraints than their Natural & Mathematical Science counterparts, although the coefficient for the Social Sciences is marginally significant.

As Table 3.5, Model 1 demonstrates, *time constraints* are deleterious to students' psychological distress ($\beta=0.30$, $p<0.001$), which indicates that greater time constraints are positively associated with the psychological distress of doctoral students. Consistent with my previously outlined hypothesis, time constraints do mediate the relationship between divisions and psychological distress (Table 3.5, Model 1). Specifically, when time constraints are added to the base model with controls, the difference in psychological distress between students in the Natural & Mathematical Sciences and the Social Sciences, disappears ($\beta=0.14$, $p=0.14$), demonstrating full mediation. This suggests that the difference in psychological distress between students in these two divisions is explained by differences in time constraints. All in all, time constraints do mediate the relationship between divisions and psychological distress.

Role Overload/Role Conflict

In Table 3.4, Model 2, we see that there are substantial differences in the experience of role overload between students in the Social Sciences and their Natural & Mathematical Science counterparts ($\beta=0.37$, $p<0.05$). Specifically, students in the Social Sciences are more likely to experience role overload than those in the Natural and Mathematical Sciences. No other divisional comparisons yield statistically significant differences. Therefore, evidence suggests that greater overload in the "soft sciences" is driven by the Social Sciences, since no meaningful differences between students in the Arts & Humanities and Natural & Mathematical Sciences are found. Additionally, students in the Professional Schools experience marginally greater role overload than their Natural & Mathematical Science

counterparts (β=0.29, p<0.10). In Table 3.4, Model 3 there are similar results regarding role conflict. Students in the Social Sciences and Professional Schools experience more work-life conflict than students in the Natural & Mathematical Sciences (β=0.37, p<0.05; β=0.35, p<0.05). In addition, students in the Arts & Humanities experience marginally greater role conflict than students in the Natural & Mathematical Sciences (β=0.30, p<0.10).

In testing for mediation, Table 3.5, Models 2 and 3 demonstrate that role overload (β=0.34, p<0.001) and role conflict (β=0.22, p<0.001) are both significant predictors of psychological distress, controlling for sex, age and race. While the former has a larger effect, both role overload and role conflict have positive associations with psychological distress, confirming that greater presence of these stressors is related to poorer mental health. The question then becomes, do these stressors, much like time constraints, mediate the relationship between divisions and psychological distress. Table 3.5, Model 2 demonstrates that role overload is a mediator for the relationship between divisions and psychological distress, with the coefficient for role overload statistically significant by conventional standards (β=0.34, p<0.001), and the relationship between students in the Natural & Mathematical Sciences and their Social Science counterparts reduced to non-significance (β=0.10, p=0.60). Interpreting the influence of role conflict on the relationship between divisions and psychological distress is virtually the same (Table 3.5, Model 3). While higher role conflict has a deleterious effect on students' mental health (β=0.22, p<0.001), the relationship between divisions and psychological distress is non-significant (β=0.14, p=0.33). Combined, these models provide evidence that role overload and role conflict are both mediators of the relationship between divisions and psychological distress.

As a whole, evidence points to the fact that students in the "soft sciences" experience greater role overload and conflict than their "hard science" doctoral peers, driven primarily by students in the Social Sciences.

Isolation

Model 1 in Tables 3.4 and 3.5 test the hypothesis that isolation mediates the relationship between divisions and psychological distress. In other words, it tackles the question: Is the lower psychological distress for students in the Natural & Mathematical Sciences, versus their Social Science counterparts, explained by differences in isolation? Evidence demonstrates that isolation is a significant positive predictor of psychological distress, when controlling for age, sex and race. In Table 3.4, Model 4, there is a marginally significant difference in isolation between students in the Natural & Mathematical Sciences and the Social Sciences. Specifically, students in the Social Sciences are more isolated than their Natural & Mathematical Science counterparts (β=-0.19, p=0.07), consistent with my hypothesis.

In the full mediation model (Table 3.5, Model 4), greater isolation leads to greater psychological distress (β=0.44, p<0.001). In fact, evidence demonstrates that isolation mediates the relationship between divisions and psychological distress, when controlling for sex, age and race – base divisional differences in psychological distress are non-significant (β=0.11, p=0.24). That is, isolation explains the relationship between divisions and psychological distress.

Funding Uncertainty

With coefficients presented in odds ratios, students in the Social Sciences (OR=0.32, p<0.01), and the Professional Schools (OR=0.18, p<0.001) report lower odds of guaranteed funding compared to those in the Natural & Mathematical Sciences. Meanwhile, students in the Arts & Humanities (OR=0.61, p=0.24) show no statistically significant difference in the odds of guaranteed funding, relative to those in the Natural & Mathematical Sciences. In general, these findings are consistent with the notion that students in the "hard" sciences are better off financially than those in the "soft" sciences. However, I did not expect students in the Arts & Humanities to have indiscernible differences in guaranteed funding, compared to those in the Natural & Mathematical Sciences.

However, *funding guarantee* is not a significant predictor of psychological distress, when controlling for sex, age and race (β=-0.04, p=0.62).[29] As a result, Model 5 in Table 3.5 demonstrates guaranteed funding does not mediate the relationship between divisions and psychological distress. That is, while the coefficient for *funding guarantee* is not significant, the association remains between divisions and psychological distress – i.e., the difference between students in the Natural & Mathematical Sciences and their Social Science counterparts – remains significant (β=0.21, p<0.05).

Analyzing differences in funding confidence across divisions (Table 3.4, Model 6), students in all divisions meaningfully vary regarding their confidence in departmental funding support, compared to those in the Natural & Mathematical Sciences. Most notable to the differences in psychological distress across divisions (Table 3.1), students in the Social Sciences are less confident about their finances than those in the Natural & Mathematical Sciences (β=-0.40, p<0.001). However, it is also noteworthy that students in the Arts & Humanities (β=-0.33, p<0.01) and the Professional Schools (β=-0.42, p<0.001) also report

[29] This analysis is not shown.

feeling less confident about their finances, compared to students in the Natural & Mathematical Sciences.

In contrast to guaranteed funding, *funding confidence* is a significant predictor of psychological distress (Table 3.5, Model 6). More specifically, the less certain students are in their ability to complete graduate training with the funding they've received, the more distressed they are, when controlling for sex, age and race (β=-0.21, $p<0.001$). *Funding confidence* explains away the association between divisions and psychological distress, reducing base divisional differences in distress to non-signficance (β=0.13, $p=0.21$). In other words, *funding confidence* mediates the relationship between divisions and psychological distress, explaining distress differences between students in the Natural & Mathematical Sciences and their Social Science counterparts.

Mentorship/Advising Quality

The relationship between the quality of mentorship/advising and psychological distress is captured in Tables 3.4-3.5. Specifically, there are three indicators that capture the resources of faculty-student mentoring/advising relationships – *faculty support, mentor/adviser satisfaction,* and *mentorship/advising relationship*. Tables 3.4-3.5 all paint a similar picture regarding the relationship between mentorship/advising (as a resource) and psychological distress. First, Table 3.4, with coefficients represented as odds ratios, demonstrates that students in the Social Sciences (OR=0.22, $p<0.05$) and the Arts & Humanities (OR=0.22, $p<0.05$) have lower odds of reporting faculty support relative to their Natural & Mathematical Science counterparts. Meanwhile, there are no statistically significant differences in the odds of faculty support between students in the Professional Schools and the Natural &

Mathematical Sciences. Therefore, the "research-team" vs. "individualized" training distinction holds regarding differences in faculty support across divisions.

In Table 3.5, Model 7 students with faculty support (by means of a mentor and/or adviser) are less likely to experience psychological distress (β=-0.45, $p<0.001$), while controlling for sex, age and race. Further, faculty support partially mediates the relationship between divisions and psychological distress such that the existence of mentorship/advising relationships marginally explains the lower distress for students in the Natural & Mathematical Sciences, relative to those in the Social Sciences. Evidence of mediation is observed because the coefficient for the Social Sciences (β=0.18, $p<0.10$ – Model 7, Table 3.5), becomes smaller and marginally significant, relative to the base model, while faculty support remains a significant independent predictor of psychological distress (β=-0.45, $p<0.001$).

Unlike *faculty support*, differences in *mentor/adviser satisfaction* across divisions are driven entirely by students in the Social Sciences and their Natural & Mathematical Science counterparts (see Table 3.4, Model 8). In other words, students in the Social Sciences have reportedly lower odds of being satisfied than their Natural & Mathematical Science counterparts with their relationships with faculty (OR=0.53, $p<0.05$). No other relationships between divisions regarding *mentor/adviser satisfaction* are statistically significant.

Much-like faculty support, *mentor/adviser satisfaction* mediates the relationship between divisions and psychological distress (Table 3.5, Model 8). First, there is evidence of a negative relationship between mentorship/advising satisfaction and psychological distress, such that as students' satisfaction with their mentors/advisers goes up, their own psychological distress goes down (β=-0.16, $p<0.05$). It follows, that mentor/adviser satisfaction mediates the relationship between divisions and psychological distress, for which

there is evidence in Table 3.5, Model 8. While mentor/adviser satisfaction is still a statistically significant predictor of psychological distress (β=-0.16, $p<0.05$), the relationship between divisions and psychological distress is now non-significant (β=0.17, $p= 0.11$) relative to the base model. This suggests, consistent with my hypothesis, that satisfaction with one's mentorship/advising relationships explains the lower psychological distress of students in the Natural & Mathematical Sciences versus their Social Science counterparts.

Lastly, I examine the association between the content of mentorship/advising relationships and psychological distress. Unlike the previous two indicators, there is no statistically significant difference across divisions in the content of mentorship/advising relationships (Table 3.4, Model 9). That is, while there may be substantive differences in the experience of students who rank high vs. low on the mentorship/advising relationship scale; these do not create meaningfully different experiences across divisions for doctoral students.

I expected more positive assessments of student-faculty relationships to translate into lower psychological distress scores for doctoral students, and Table 3.5, Model 9 suggests this to be the case. As students' assessments of their relationships with mentors/advisers become more favorable (go up), their psychological distress goes down (β=-0.27, $p<0.001$). However, Table 3.5, Model 9 also demonstrates that *mentorship/advising relationships* do not mediate the relationship between divisions and psychological distress. That is, while relationships with mentors/advisers remain a significant predictor of psychological distress (β=-0.27, $p<0.001$), they do not reduce differences in psychological distress between students in the Natural & Mathematical Sciences and their Social Science counterparts to zero or non-significance (β=0.25, $p<0.05$). Therefore, the content of

mentorship/advising relationships do not explain the lower distress scores of students in the Natural & Mathematical Sciences versus students in the Social Sciences.[30]

Differences in Psychological Distress by Department Characteristics

In the analyses that follow, Table 3.6 provides OLS regression coefficients for the relationship between department characteristics and psychological distress, with controls. Each table that follows (Table 3.7-3.11) represents a single relationship between a department characteristic and psychological distress, with stressors/resources as mediators (Models 1-9). Evidence of mediation occurs if coefficients from the baseline models in Table 3.6 are reduced to zero or non-significance in the corresponding mediation models (Tables 3.7-3.11). Analyses are organized by department characteristics – i.e., with each section representing the relationship between a department characteristic and psychological distress. All significant mediators of the relationship between a department characteristic and psychological distress will be addressed within the section.

Explaining Differences in Distress by Department Characteristics

Table 3.6 provides OLS regression coefficients for the relationship between department characteristics and psychological distress. Department climate is a marginally significant predictor of psychological distress (Models 2 and 3), such that greater interaction with students (β=-0.16, $p<0.10$) and greater interaction with faculty (β=-0.14, $p<0.10$), is

[30] For reference, supplementary OLS regression models were run within each division, to isolate any departments driving base differences in psychological distress between students in the Natural & Mathematical Sciences and Social Sciences (Tables A3.1, A3.2, and A3.3 in Appendix A). Table A3.1 demonstrates that students in the Department of Gender Studies (β=0.67, $p<0.05$), Geography (β=0.93, $p<0.05$), Anthropology (β=0.38, $p<0.05$), and Second Language Studies (β=0.87, $p<0.10$), each in the Social Sciences, have higher psychological distress scores than their Natural & Mathematical student counterparts. In this regard, base divisional differences in psychological distress must be interpreted carefully as differences in these departments may drive them. However, it is worthwhile to note that all departments in the Social Sciences have positive coefficients, indicating their greater overall distress relative to students in the Natural & Mathematical Sciences.

positively associated with students' experiences of psychological distress, when controlling for sex, age and race. In addition, funding competition is a statistically significant predictor of students' psychological distress (Model 5). Specifically, funding competition (β=0.10, $p<0.01$) is associated with greater experiences of psychological distress, when controlling for sex, age and race. In this manner, both department climate and funding structure provide evidence to support my hypotheses regarding the relationship between department characteristics and students' psychological distress. However, the structure of mentorship/advising programs (i.e., the manner in which student-faculty relationships are initiated) and department stipend are not significant predictors of students' psychological distress. Specifically, in Table 3.6, Models 1 and 4, the coefficients for student-initiated mentorship/advising (β=0.04, p=0.66) and stipend (β=-0.01, p= 0.41) are non-significant, meaning they do not predict students' psychological distress outcomes. Given this, I describe the mediation results for the relationships between interaction with students, interaction with faculty and funding competition with psychological distress.

Stressors/Resources as Mediators

Interaction with Students

The base models in Tables 3.8 and 3.9 represent the relationship between department climate and students' psychological distress. *Interaction with students* (Table 3.8, Base Model) is a marginally significant predictor of students' psychological distress, when controlling for sex, age and race (β= -0.16, $p<0.10$). In this manner, department-sponsored events allowing for interaction between graduate students, are associated with lower psychological distress. Meanwhile, stressors, such as time constraints (Model 1, β=0.30, $p<0.001$), role overload (Model 2, β=0.34, $p<0.001$), role conflict (Model 3, β=0.22, $p<0.001$), and isolation (Model

4, β=0.44, p<0.001), all mediate the relationship between *interaction with stude*nts and psychological distress. Mediation is observed in Models 1 through 4, as the coefficients for *interaction with students* becomes non-significant, relative to the base model. This means that the beneficial effect of interaction with students on psychological distress is explained by lower time constraints, lower role overload, lower role conflict and lower isolation.

In contrast, resources, such as funding confidence (Model 6, β= -0.21, p<0.001), faculty support (Model 7, β= -0.45, p<0.001), mentor/adviser satisfaction (Model 8, β= -0.17, p<0.05) and mentor/adviser relationships (Model 9, β= -0.26, p<0.001), reduce students' experiences of psychological distress, when controlling for sex, age and race. Mediation is observed in Models 6 through 9 as the coefficients for *interaction with students* is non-significant, and the resource predictors are negative and statistically significant. As predicted, these resources reduce the psychological distress that students experience, above and beyond the benefits of department climate. In other words, the relationship between interaction with students and psychological distress is also mediated by funding and faculty resources.

Interaction with Faculty

Table 3.9, highlighting the second department climate measure, paints a similar picture – the base model demonstrates that interaction with faculty is associated with lower psychological distress (β=-0.14, p<0.10), controlling for sex, age and race. This means that department-sponsored events, aimed at mingling students and faculty, are beneficial to students' mental health outcomes; or that students with better mental health appreciate interaction with faculty. Like above, stressors – time constraints, role overload, role conflict and isolation – mediate this relationship. In Models 1 through 4 (Table 3.9), coefficients for interaction with faculty are non-significant, as a result of the presence of stressors – time constraints (Model

1, β=-0.12, p=0.11), role overload (Model 2, β=-0.08, p=0.23), role conflict (Model 3, β=-0.09, p=0.25), and isolation (Model 4, β=-0.02, p=0.23) – providing evidence of full mediation. In other words, department climate as measured by interaction between students and faculty is associated with lower psychological distress, through lower stressors.

Table 3.9, Models 6 through 9 demonstrate that resources – funding confidence, faculty support, mentor/adviser satisfaction and mentor/adviser relationships – also mediate the relationship between interaction with faculty and psychological distress. Each resource has a statistically significant, negative coefficient, demonstrating that they are associated with lower psychological distress – funding confidence (Model 6, β=-0.21, p<0.001), faculty support (Model 7, β=-0.44, p<0.001), mentor/adviser satisfaction (Model 8, β=-0.17, p<0.05), and mentor/adviser relationship (Model 9, β=-0.26, p<0.001). Further, the presence of each of these stressors has reduced the coefficient for interaction with faculty to non-significant, compared to the base model – Model 6 (β=-0.10, p=0.21), Model 7 (β=-0.11, p=0.18), Model 8 (β=-0.13, p=0.12), and Model 9 (β=-0.08, p= 0.36). Therefore, the relationship between department climate, measured by interaction between students and faculty, and students' psychological distress, is also mediated by funding and faculty resources. Model 5 – funding guarantee – does not mediate the relationship between either measure of department climate and students' psychological distress.

Funding Competition

Lastly, Table 3.11, Base Model demonstrates the relationship between funding competition and students' psychological distress. Evidence suggests that funding competition (β=0.10, p<0.01) is associated with higher psychological distress, controlling for sex, age and race. This is consistent with my expectations and supports findings in the research literature

regarding the importance of funding to students' doctoral careers. However, mediation of this relationship by stressors and resources point to some important findings. In Model 2 (Table 3.11), role overload – a stressor – demonstrates partial mediation of the relationship between funding competition and psychological distress. In particular, the coefficient for funding competition is now marginally significant and smaller, compared to the base model (β=0.05, $p<0.10$). As such, role overload – a feeling that one's responsibilities exceed one's capacities – partially mediates the relationship between funding competition and psychological distress.

In Model 4, *isolation* fully mediates the relationship between funding competition and psychological distress. Specifically, while isolation itself is detrimental to students' psychological distress (β=0.43, $p<0.001$), as expected, this explains away the relationship between funding competition and psychological distress. In other words, feeling social and academic distance from peers explains students' psychological distress above and beyond funding competition.[31]

Lastly, Model 6 – funding confidence – highlights a resource that partially mediates the relationship between funding competition and psychological distress. Here, there is evidence that funding confidence is not only associated with lower psychological distress (β=-0.20, $p<0.001$), it reduces the coefficient for funding competition to non-significance (β=0.06, $p=0.06$). Although low funding confidence may be the mechanism through which funding competition influences psychological distress, another possibility is that the detrimental impact of funding competition on students' psychological distress is explained away, in part, by funding confidence. Put another way, when students are confident in their

[31] I return to this idea in the qualitative analysis of Chapter 5.

ability to fulfill their financial needs over the course of the doctoral program, the effect of funding competition on psychological distress goes away, unsurprisingly.

The remaining stressors – time constraints (Model 1) and role conflict (Model 3) – and resources – funding guarantee (Model 5), faculty support (Model 7), mentor/adviser satisfaction (Model 8) and mentor/adviser relationship (Model 9) – do not mediate the relationship between funding competition and students' psychological distress.

Overall, while relationships between department climate and students' psychological distress are mediated by stressors and resources, these results should be interpreted with caution, because base model coefficients are marginally significant. However, the detrimental impact of funding competition on students' psychological distress, is mediated in part by role overload (a stressor) and funding confidence (a resource), and in full, by experiences of isolation.

DISCUSSION

Consistent with my hypotheses about broad disciplinary differences in the "hard" and "soft" sciences, evidence presented here demonstrates that students in the Social Sciences are more likely to experience psychological distress than those in the Natural & Mathematical Sciences. However, these differences are largely driven by stressors and resources, which mediate the relationship between divisions and psychological distress – namely time constraints, role overload, role conflict, isolation, funding confidence, faculty support (partial mediation) and mentor/adviser satisfaction. On the other hand, department characteristics – mentorship/advising structure, department climate, and funding structure – do not mediate the relationship between divisions and psychological distress, contrary to expectation.

The implications of these findings should be examined closely – not only do department characteristics not mediate the relationship between divisions and psychological distress, the only department characteristics that predict psychological distress outcomes are department climate (marginal significance for *interaction with students* and *interaction with faculty*) and funding competition. In the case of department climate, a marginally significant predictor, the difficulty may be specification. As noted in Chapter 2, the two indicators of department climate are rather crude approximations of department collegiality and support. It is possible that a better specified or multidimensional scale would better capture department climate, and provide evidence stronger evidence to support my hypotheses. However, it is noteworthy that the mediation models for department climate (Tables 3.8 and 3.9), demonstrate mediation from stressors and resources in the predicted direction. As such, evidence points to the fact that students' proximate stress experiences, with social and academic responsibilities and relationships, may dominate their daily lives, and have a greater impact on experiences of distress than department climate.

While itself a statistically significant predictor of psychological distress, funding competition does not mediate the relationship between divisions and psychological distress. In this regard, it appears other features (such as stressors/resources) explain the relationship between divisions and psychological distress. However, the importance of funding competition for understanding students' psychological distress outcomes, as described in the mediation models of Table 3.11, should not be underestimated.

In the case of mentorship/advising and funding, while student-initiated relationships and stipend values differentiate students across divisions, they are not linked to students' stress experiences. Therefore, student-faculty relationships and funding may be paramount to social and academic experiences in graduate school, as research suggests, but insignificant

regarding psychological consequences. Another possibility is that mentorship/advising relationships and funding, as measured here, do not capture the important dimensions of graduate departments that may be influential to students' psychological distress outcomes. For example, since 10-month funding packages are common amongst graduate students across divisions, it is possible that the propensity for departments to offer summer funding, is a better predictor of students' psychological distress, and would therefore mediate the relationship between divisions and psychological distress. However, it is certainly possible that my hypotheses were incorrect from the outset. Further discussion of these findings and their implication for future work are discussed in Chapter 6.

Table 3.1 OLS Regression of Psychological Distress on Divisions

	Base Model	*Base Model w/ Controls*
Variables		
Divisions		
Arts & Humanities	0.13	0.13
	(0.10)	(0.10)
Social Sciences	0.23*	0.21*
	(0.10)	(0.10)
Professional Schools	0.12	0.13
	(0.10)	(0.10)
Controls		
Sex (Female=1)		0.17*
		(0.07)
Age		-0.01
		(0.01)
Race (White=1)		-0.20+
		(0.12)
N		540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.2 Regression of Department Characteristics on Divisions

	Model 1 Student-Initiated Mentorship/Advising Program	*Model 2 Interaction with students*	*Model 3 Interaction with Faculty*	*Model 4 Stipend*	*Model 5 Funding Competition*
Variables					
Divisions					
Arts & Humanities	0.35***	1.27	1.33	-3.90***	0.13
	(0.11)	(0.45)	(0.39)	(0.29)	(0.13)
Social Sciences	0.16***	1.02	0.96	-4.67***	0.08
	(0.05)	(0.36)	(0.28)	(0.30)	(0.14)
Professional Schools	0.37***	0.45**	1.08	-2.53***	0.33**
	(0.10)	(0.14)	(0.31)	(0.35)	(0.13)
Controls					
Sex (Female=1)	0.76	0.83	0.76	-0.27	0.23*
	(0.17)	(0.20)	(0.16)	(0.22)	(0.10)
Age	0.97	1.01	0.99	-0.06**	0.03***
	(0.02)	(0.02)	(0.02)	(0.19)	(0.01)
Race (White=1)	1.50	2.00*	1.31	0.87*	-0.12
	(0.56)	(0.06)	(0.42)	(0.36)	(0.15)
N	540	540	540	540	540

Note: Coefficients for Models 1, 2, and 3 are from logistic regressions and represented as odds ratios
Coefficients for Models 4 and 5 are from OLS regressions
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.3: OLS Regression of Psychological Distress on Divisions with Department Characteristics as Mediators

	Base Model	*Model 1 Student-Initiated Mentorship/Advising Program*	*Model 2 Interaction with students*	*Model 3 Interaction with Faculty*	*Model 4 Stipend*	*Model 5 Funding Competition*
Variables						
Divisions						
Arts & Humanities	0.13	0.17	0.14	0.14	0.15	0.13
	(0.10)	(0.12)	(0.10)	(0.10)	(0.10)	(0.10)
Social Sciences	0.21*	0.24*	0.22*	0.21*	0.25+	0.21*
	(0.10)	(0.11)	(0.10)	(0.10)	(0.13)	(0.10)
Professional Schools	0.13	0.11	0.10	0.13	0.20	0.09
	(0.10)	(0.10)	(0.10)	(0.10)	(0.13)	(0.10)
Mediator						
		0.09	-0.17+	-0.14+	0.07	0.10**
		(0.09)	(0.09)	(0.08)	(0.02)	(0.03)
Controls						
Sex (Female=1)	0.17*	0.15+	0.17*	0.16*	0.19*	0.14*
	(0.07)	(0.08)	(0.07)	(0.07)	(0.08)	(0.06)
Age	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Race (White=1)	-0.20+	-0.18	-0.17	-0.19	-0.20	-0.19
	(0.12)	(0.12)	(0.12)	(0.12)	(0.13)	(0.12)
N	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.4 Regression of Stressors/Resources on Divisions

	Model 1 *Time Constraints*	**Model 2** *Role Overload*	**Model 3** *Role Conflict*	**Model 4** *Isolation*	**Model 5** *Funding Guarantee*	**Model 6** *Funding Confidence*	**Model 7** *Faculty Support*	**Model 8** *Mentor/Adviser Satisfaction*	**Model 9** *Mentor/Adviser Relationship*
Variables									
Divisions									
Arts & Humanities	0.29*	0.17	0.30+	0.12	0.61	-0.33**	0.22*	0.66	-0.02
	(0.14)	(0.15)	(0.16)	(0.10)	(0.26)	(0.13)	(0.15)	(0.20)	(0.08)
Social Sciences	0.26+	0.37*	0.37*	0.19+	0.32**	-0.40**	0.22*	0.53*	0.03
	(0.15)	(0.15)	(0.16)	(0.11)	(0.13)	(0.12)	(0.15)	(0.16)	(0.08)
Professional Schools	0.17	0.29+	0.35*	0.13	0.18***	-0.42***	0.60	0.76	0.04
	(0.14)	(0.15)	(0.16)	(0.10)	(0.07)	(0.11)	(0.43)	(0.23)	(0.08)
Controls									
Sex (Female=1)	0.19+	0.26*	0.22+	0.08	0.76	-0.14+	1.77	0.73	-0.01
	(0.10)	(0.11)	(0.11)	(0.07)	(0.18)	(0.08)	(0.62)	(0.16)	(0.06)
Age	0.004	-0.01	0.003	0.02**	0.93***	-0.01*	0.99	0.97*	-0.002
	(0.008)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.03)	(0.02)	(0.005)
Race (White=1)	-0.02	-0.27	0.21	-0.03	1.27	0.18	1.55	0.79	0.05
	(0.16)	(0.17)	(0.18)	(0.12)	(0.44)	(0.13)	(0.80)	(0.27)	(0.10)
N	540	540	540	540	540	540	540	540	540

Note: Coefficients for Models 5, 7, and 8 are from logistic regressions and represented as odds ratios
Coefficients for Models 1, 2, 3, 4, 6 and 9 are from OLS regressions
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.5: OLS Regression of Psychological Distress on Divisions with Stressors/Resources as Mediators

	Base Model	**Model 1** *Time Constraints*	**Model 2** *Role Overload*	**Model 3** *Role Conflict*	**Model 4** *Isolation*	**Model 5** *Funding Guarantee*	**Model 6** *Funding Confidence*	**Model 7** *Faculty Support*	**Model 8** *Mentor/Adviser Satisfaction*	**Model 9** *Mentor/Adviser Relationship*
Variables										
Divisions										
Arts & Humanities	0.13	0.05	0.08	0.07	0.07	0.13	0.06	0.10	0.10	0.14
	(0.10)	(0.09)	(0.09)	(0.10)	(0.09)	(0.10)	(0.10)	(0.10)	(0.10)	(0.11)
Social Sciences	0.21*	0.14	0.10	0.14	0.11	0.21*	0.13	0.18+	0.17	0.25*
	(0.10)	(0.10)	(0.09)	(0.10)	(0.10)	(0.11)	(0.10)	(0.10)	(0.11)	(0.11)
Professional Schools	0.13	0.07	0.03	0.05	0.05	0.12	0.04	0.12	0.11	0.13
	(0.10)	(0.09)	(0.09)	(0.10)	(0.09)	(0.11)	(0.10)	(0.10)	(0.10)	(0.11)
Mediator										
		0.30***	0.34***	0.22***	0.44***	-0.03	-0.21***	-0.45***	-0.16*	-0.27***
		(0.03)	(0.03)	(0.03)	(0.04)	(0.09)	(0.04)	(0.14)	(0.08)	(0.06)
Controls										
Sex (Female=1)	0.17*	0.11	0.08	0.12+	0.14*	0.17*	0.14*	0.19**	0.15*	0.15+
	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)
Age	-0.01	-0.01+	-0.01	-0.01	-0.02**	-0.01	-0.01+	-0.01	-0.01+	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Race (White=1)	-0.20+	-0.19+	-0.10	-0.24*	-0.18+	-0.19	-0.16	-0.18	-0.20+	-0.08
	(0.12)	(0.11)	(0.10)	(0.11)	(0.11)	(0.12)	(0.11)	(0.12)	(0.12)	(0.13)
N	540	540	540	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.6: OLS Regression of Psychological Distress on Department Characteristics

	Model 1 *Student-Initiated Mentorship/Advising Program*	**Model 2** *Interaction with students*	**Model 3** *Interaction with Faculty*	**Model 4** *Stipend*	**Model 5** *Funding Competition*
Variables					
Department Characteristics					
	0.04	-0.16+	-0.14+	-0.01	0.10**
	(0.08)	(0.09)	(0.08)	(0.01)	(0.03)
Controls					
Sex (Female=1)	0.15+	0.17*	0.17*	0.18*	0.14*
	(0.08)	(0.07)	(0.07)	(0.08)	(0.07)
Age	-0.01	-0.01	-0.01	-0.004	-0.01+
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Race (White=1)	-0.19	-0.19	-0.20+	-0.21	-0.20+
	(0.12)	(0.12)	(0.12)	(0.13)	(0.12)
N	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.7: OLS Regression of Psychological Distress on Student-Initiated Mentorship/Advising Program with Stressors/Resources as Mediators

	Base Model	**Model 1** *Time Constraints*	**Model 2** *Role Overload*	**Model 3** *Role Conflict*	**Model 4** *Isolation*	**Model 5** *Funding Guarantee*	**Model 6** *Funding Confidence*	**Model 7** *Faculty Support*	**Model 8** *Mentor/Adviser Satisfaction*	**Model 9** *Mentor/Adviser Relationship*
Variables										
Department Characteristic										
Student-Initiated Mentorship/Advising Program	0.04 (0.08)	0.06 (0.07)	0.03 (0.07)	0.07 (0.08)	0.02 (0.07)	0.04 (0.08)	0.02 (0.08)	0.03 (0.08)	0.04 (0.08)	0.01 (0.09)
Mediator		0.31*** (0.03)	0.35*** (0.03)	0.24*** (0.03)	0.44*** (0.04)	-0.01 (0.09)	-0.22*** (0.04)	-0.42** (0.17)	-0.19* (0.08)	-0.24*** (0.07)
Controls										
Sex (Female=1)	0.15+ (0.08)	0.06+ (0.07)	0.03 (0.07)	0.09 (0.07)	0.10 (0.07)	0.15+ (0.08)	0.12 (0.08)	0.17* (0.08)	0.14+ (0.08)	0.16+ (0.09)
Age	-0.01 (0.01)	-0.01+ (0.01)	-0.004 (0.01)	-0.01 (0.01)	-0.01** (0.01)	-0.01 (0.01)	-0.01* (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Race (White=1)	-0.19 (0.12)	-0.15 (0.11)	-0.08 (0.11)	0.21+ (0.11)	-0.17 (0.11)	-0.19 (0.12)	-0.12 (0.12)	-0.17 (0.12)	-0.19 (0.13)	-0.06 (0.14)
N	540	540	540	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.8: OLS Regression of Psychological Distress on Interaction with Students with Stressors/Resources as Mediators

	Base Model	**Model 1** *Time Constraints*	**Model 2** *Role Overload*	**Model 3** *Role Conflict*	**Model 4** *Isolation*	**Model 5** *Funding Guarantee*	**Model 6** *Funding Confidence*	**Model 7** *Faculty Support*	**Model 8** *Mentor/Adviser Satisfaction*	**Model 9** *Mentor/Adviser Relationship*
Variables										
Department Characteristic										
Interaction with Students	-0.16+	-0.08	-0.10	-0.10	0.02	-0.16+	-0.07	-0.14	0.14	-0.09
	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)
Mediator		0.30***	0.34***	0.22***	0.44***	-0.04	-0.21***	-0.45***	-0.17*	-0.26***
		(0.03)	(0.03)	(0.03)	(0.04)	(0.09)	(0.04)	(0.14)	(0.08)	(0.06)
Controls										
Sex (Female=1)	0.17*	0.10	0.08	0.11	0.14*	0.17*	0.14+	0.18**	0.15+	0.15+
	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)
Age	-0.01	-0.01+	-0.005	-0.01+	-0.01**	-0.01	-0.01*	-0.01	-0.01+	-0.01
	(0.01)	(0.004)	(0.004)	(0.01)	(0.004)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Race (White=1)	-0.19	-0.19+	-0.09	-0.23*	-0.19+	-0.18	-0.15	-0.18	-0.19	-0.09
	(0.12)	(0.11)	(0.10)	(0.11)	(0.11)	(0.12)	(0.11)	(0.12)	(0.12)	(0.13)
N	540	540	540	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.9: OLS Regression of Psychological Distress on Interaction with Faculty with Stressors/Resources as Mediators

	Base Model	**Model 1** *Time Constraints*	**Model 2** *Role Overload*	**Model 3** *Role Conflict*	**Model 4** *Isolation*	**Model 5** *Funding Guarantee*	**Model 6** *Funding Confidence*	**Model 7** *Faculty Support*	**Model 8** *Mentor/Adviser Satisfaction*	**Model 9** *Mentor/Adviser Relationship*
Variables										
Department Characteristic										
Interaction with Faculty	-0.14+	-0.12	-0.08	-0.09	-0.02	-0.15+	-0.10	-0.11	-0.13	-0.08
	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)
Mediator		0.30***	0.34***	0.22***	0.44***	-0.05	-0.21***	-0.44***	-0.17*	-0.26***
		(0.03)	(0.03)	(0.03)	(0.04)	(0.09)	(0.04)	(0.14)	(0.08)	(0.06)
Controls										
Sex (Female=1)	0.17*	0.10	0.08	0.11	0.14*	0.16*	0.13+	0.18**	0.14+	0.15+
	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)
Age	-0.01	-0.01+	-0.01	-0.01+	-0.01**	-0.01	-0.01*	-0.01	-0.01+	-0.01
	(0.01)	(0.004)	(0.004)	(0.01)	(0.004)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Race (White=1)	-0.20+	-0.19+	-0.10	-0.24*	-0.19+	-0.20+	-0.16	-0.19	-0.21+	-0.10
	(0.12)	(0.11)	(0.10)	(0.11)	(0.11)	(0.12)	(0.11)	(0.12)	(0.12)	(0.13)
N	540	540	540	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.10: OLS Regression of Psychological Distress on Stipend with Stressors/Resources as Mediators

	Base Model	**Model 1** *Time Constraints*	**Model 2** *Role Overload*	**Model 3** *Role Conflict*	**Model 4** *Isolation*	**Model 5** *Funding Guarantee*	**Model 6** *Funding Confidence*	**Model 7** *Faculty Support*	**Model 8** *Mentor/Adviser Satisfaction*	**Model 9** *Mentor/Adviser Relationship*
Variables										
Department Characteristic										
Stipend	-0.01	0.001	-0.003	-0.001+	-0.004	0.003	-0.10	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.08)	(0.01)	(0.01)	(0.01)
Mediator		0.32***	0.35***	0.24***	0.42***	-0.26***	-0.21***	-0.40**	-0.15+	-0.22**
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.15)	(0.09)	(0.07)
Controls										
Sex (Female=1)	0.18*	0.12+	0.07	0.13+	0.14+	0.16*	0.13+	0.20**	0.17*	0.17+
	(0.08)	(0.07)	(0.07)	(0.08)	(0.07)	(0.08)	(0.07)	(0.08)	(0.08)	(0.09)
Age	-0.004	-0.01	-0.004	-0.01	-0.02**	-0.01	-0.01*	-0.04	-0.01	0.0004
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Race (White=1)	-0.21	-0.20+	-0.10	-0.22+	-0.24*	-0.15	-0.16	-0.19	-0.22+	-0.10
	(0.13)	(0.12)	(0.11)	(0.12)	(0.12)	(0.12)	(0.11)	(0.13)	(0.14)	(0.14)
N	540	540	540	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3.11: OLS Regression of Psychological Distress on Funding Competition with Stressors/Resources as Mediators

	Base Model	**Model 1** *Time Constraints*	**Model 2** *Role Overload*	**Model 3** *Role Conflict*	**Model 4** *Isolation*	**Model 5** *Funding Guarantee*	**Model 6** *Funding Confidence*	**Model 7** *Faculty Support*	**Model 8** *Mentor/Adviser Satisfaction*	**Model 9** *Mentor/Adviser Relationship*
Variables										
Department Characteristic										
Funding Competition	0.10**	0.07*	0.05+	0.09**	0.05	0.11***	0.06+	0.11***	0.11***	0.09**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Mediator		0.30***	0.34***	0.22***	0.43***	0.06	-0.20***	-0.46***	-0.16*	-0.25***
		(0.03)	(0.03)	(0.03)	(0.04)	(0.09)	(0.04)	(0.14)	(0.08)	(0.06)
Controls										
Sex (Female=1)	0.14*	0.08	0.07	0.09	0.13+	0.14*	0.12+	0.16*	0.13+	0.14+
	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)
Age	-0.01+	-0.01**	-0.01+	-0.01*	-0.02***	-0.01+	-0.01**	-0.01*	-0.01*	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Race (White=1)	-0.20+	-0.20+	-0.10	-0.24*	-0.19+	-0.20+	-0.16	-0.18	-0.20	-0.09
	(0.12)	(0.11)	(0.10)	(0.11)	(0.10)	(0.12)	(0.11)	(0.12)	(0.12)	(0.13)
N	540	540	540	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

CHAPTER FOUR:
MODERATORS OF PSYCHOLOGICAL DISTRESS

INTRODUCTION

In this Chapter, I present findings from moderation models that address two central research questions: First, do department characteristics (i.e., mentorship/advising, funding structure, and department climate) moderate the effects of stressors/resources (i.e., role overload, isolation, funding uncertainty) on mental health outcomes? Second, are there differences in the effects of department characteristics (i.e., mentorship/advising, funding structure, and department climate) and stressors/resources (i.e., time constraints, role overload, isolation, funding uncertainty) on psychological distress by gender and race/ethnicity? The hypotheses and results in this chapter will be organized in three subsections – 1) Department characteristics as moderators of the relationship between stressors/resources and psychological distress; 2) Gender and race/ethnicity as moderators of the relationship between department characteristics and psychological distress, and; 3) Gender and race/ethnicity as moderators of the relationship between stressors/resources and psychological distress.

HYPOTHESES

Department Characteristics as Moderators

As prior literature dictates, graduate students endure pervasive exposure to stressors (i.e., the circumstance that gives rise to stress) as a result of their liminal position in graduate school (neither fully professionals nor scholastic novices) and the strenuous academic undertaking of doctoral work (Goplerud 1980, Grady 2014, Walfish 2001). In addition, students may rely on support resources to counteract these deleterious effects (discussed below). In accordance with the stress process model, exposure to stressors – in this case, time constraints, role conflict, role overload, and isolation –

should have a deleterious effect on psychological distress; whereas resources – funding and mentorship/advising relationships – should have a beneficial impact on students' psychological distress (Pearlin 1989, Thoits 1995). However, the magnitude of this effect may depend on the conditions of department characteristics (i.e., mentorship/advising, department climate, and funding structure). Therefore, I hypothesize that while stressors increase students' psychological distress, this relationship may be moderated by department characteristics (i.e., mentorship/advising, department climate, funding structure).

Because graduate students experience pronounced stress regarding time management and the fulfillment of academic responsibilities, I expect greater time constraints to lead to poorer mental health outcomes for graduate students. Role overload, which is the difficulty students' experience fulfilling academic and non-academic responsibilities within the limitations of their energy and stamina, is also likely to increase the stress that graduate students' experience (Pearlin 1989). In this manner, I expect greater role overload to lead to poorer mental health outcomes for graduate students. Similarly, role conflict, which refers to the simultaneous but incompatible demands associated with graduate students' roles (which may be academic and/or non-academic), is predicted to increase graduate students' psychological distress (Grady 2014). Lastly, isolation – a social, physical and/or intellectual distance from others – is estimated to be harmful to students' psychological distress (Delamont 1999). These stressors are predicted to have a "positive" relationship with psychological distress – that is, as the stressors increase, psychological distress also increases.

The remaining five resources – guaranteed funding, funding confidence, faculty support, mentor/adviser satisfaction and mentor/adviser relationships – are expected to reduce students' psychological distress. Regarding guaranteed funding and funding confidence, students are expected to experience less psychological distress when secure in their ability to finance doctoral studies

(either through a guaranteed incoming offer of department financial support or through external support). Similarly, students are expected to benefit from relationships with faculty, in the form of faculty support, and satisfying/meaningful relationships with mentors/advisers. These latter resources, overall, are predicted to have a "negative" relationship with psychological distress – that is, as the resources increase, psychological distress decreases. For example, a sociable and supportive department climate – as indicated by greater interaction between faculty and graduate students – is expected to moderate the relationship between isolation and psychological distress. Specifically, I expect the isolation graduate students experience to be less strongly associated with mental health in a supportive department climate. In this case, as the moderator (interaction between faculty and graduate students) increases, the relationship between isolation and psychological distress should decrease. In contrast, I expect the effect of faculty support on psychological distress to be augmented by a sociable and supportive climate. That is, I expect the benefit students' experience from faculty support to be heightened, relative to their counterparts, in departments that are also supportive.

Gender and Race/Ethnicity as Moderators

The second relationship of note is between department characteristics and psychological distress, moderated by gender and race/ethnicity. That is, I suggest that the effects of department characteristics (i.e., the mentorship/advising program, department climate and funding structure) on students' psychological distress are moderated by their socio-demographic backgrounds.

It is possible, however, that socio-demographic factors moderate the relationship between department characteristics and psychological distress, outlined above. For example, I expect the structure of mentorship/advising – specifically the extent to which mentorship/advising relationships are student initiated – to have a larger effect on the psychological distress of racial/ethnic minorities and women, compared to their White and male counterparts, respectively.

This hypothesis is grounded in the argument that graduate students' stress experiences are delineated, at least in part, by structures of inequality (Thoits 1995). Because they are more likely to experience distress from marginalized backgrounds (e.g., via microagressions, tokenism, sexism and the like), when formal mentorship/advising programs exist, women and racial/ethnic minorities are likely to benefit from access to faculty support (Dedrick 2002, Tharenou 2005, Walfish 2001). In this manner, their socio-demographic backgrounds may moderate the relationship between mentorship/advising structure and psychological distress.

Regarding department climate, I expect the effect of a sociable and supportive environment on psychological distress to be especially pronounced for female and racial/ethnic minority students, as they are more likely than their counterparts to experience marginalization. While this will vary considerably by program and division, evidence suggests that academia largely mirrors patterns of exclusion in society as a whole, with an historic legacy of excluding racial/ethnic minorities (Golde 2005). A supportive department climate, as measured by concerted efforts by the department to integrate faculty and students, should have greater benefits for female graduate students and racial/ethnic minorities.

Lastly, the structure of department funding is expected to have a larger impact on the psychological distress of female and racial/ethnic minority students, as these groups are more likely to incur financial burdens throughout their doctoral career. As delineated in the literature, students from racial/ethnic minority backgrounds are more likely to report dependence on personal financial resources for their graduate education, and to incur familial obligations relative to their White counterparts (Corona-Ordonez 2013, Millett 1995, Pinquart 2005). In a similar vein, I expect that caregiving responsibilities are unduly burdensome to female graduate students as caregiving responsibilities, overall, are typically responsibility of women. As a result, both guaranteed funding

and the absence of funding competition are expected to have an especially advantageous effect on the psychological distress of female and racial/ethnic minority graduate students (Maher 2004).

Third, I suggest that the relationship between stressors/resources and psychological distress may be moderated by socio-demographic characteristics. As the basic relationships have already been outlined, I will detail how and why I expect socio-demographic characteristics to moderate the relationship between graduate stressors/resources and psychological distress (for a detailed literature on differences in racial/ethnic and gender differences in exposure and vulnerability to stressful events, see Brown (2013)). This model considers the hypothesis that the effects of /resources on psychological distress may differ for students from various socio-demographic backgrounds. For example, female graduate students may have greater needs by virtue of the institutional barriers they face relative to their male counterparts (School 2013, Walfish 2001). As such, the effect of mentorship/advising quality on psychological distress, may be greater for women in response to their greater mentorship needs (Rose 2005, Walfish 2001). A similar argument can be detailed for understanding the effects of /resources for racial/ethnic minorities versus their counterparts. For example, I anticipate that racial/ethnic minority students will experience greater effects from isolation and poor mentorship/advising quality, compared to their White counterparts, because of threats of tokenism and symbolic racism in academic environments. In all, I expect the effects of time constraints, role overload, role conflict and isolation on psychological distress to be pronounced (i.e., worse) for students from marginalized socio-demographic backgrounds (i.e., women and racial/ethnic minorities). Meanwhile, I propose that the benefits of guaranteed funding, funding confidence, faculty support, mentor/adviser satisfaction and relationship quality on psychological distress, should be large (i.e., better) for students from marginalized socio-demographic backgrounds (i.e., women and racial/ethnic minorities).

METHODS

This section briefly details the department characteristics, /resources, socio-demographic factors and psychological distress measures used in the moderation models (for further details on measures, see Chapter 2: Data and Methods). Department characteristics capture three areas: mentorship/advising, department climate and funding structure. Two binary variables capture mentorship/advising relationships at the department level; *existing program* which measures the presence and/or absence of a formal mentorship/advising program in a doctoral department, and *student-initiated program* which measures how faculty-student mentorship/advising relationships come about. Department climate is captured with two additional, binary (yes/no) variables; *interaction with faculty* which measures whether academic departments sponsor events that allow for informal conversation and interaction between faculty and graduate students; and *interaction with students* which measures whether the academic department sponsors events that allow for information conversation and interaction among students. For funding structure, two variables are captured at the departmental level;[32] *funding competition* – a scaled measure assessing how much competition for funding/assistantships there is among students in a doctoral program (from 0=none to 3 = a great deal), and *stipend* – a ratio-level variable capturing the dollar value of students' annual funding.

Nine additional variables capture and resources that fall into six broad categories: time constraints, role overload, role conflict, isolation, funding, and mentorship/advising. As a reminder, stressors summarize variation in stress exposure, as perceived by doctoral students themselves. *Time constraints, role overload, role conflict and isolation,* are measured on the same scale (ranging from 0= never to 4= very often), indicating how often students have experienced each stressor in the past 30 days. Five additional variables capture resources – two quantify funding support and three measure mentorship/advising. The first, a binary variable, is *funding guarantee*, asking students whether their

[32] As a reminder, funding structure was originally three variables, but *guaranteed funding* was removed as there was not enough variation across students and divisions to isolate meaningful results.

offer of admission into a doctoral program included guaranteed, multi-year financial support. The second, *funding confidence*, is a four-point scale asking students how confident they feel that their funding will be sufficient to complete graduate training (responses range from 0=not at all confident to 3=very confident). The variables measuring mentorship/advising quality begin with *faculty support,* a binary measure distinguishing students who report having an adviser or mentor, from those who do not. As a complement, the binary measure *mentor/adviser satisfaction* captures the extent to which students reflect favorably on the quality of their relationship with a mentor or adviser. Finally, *mentor/adviser relationship* measures the content of student-faculty relationships by assessing how much students agree or disagree with a series of statements about faculty support (responses range from 1=strongly disagree to 4=strong agree).[33] The outcome measure for all moderation models, unless otherwise specified, is psychological distress, captured by the *k6*, a screening scale of mental illness validated as a measure of mental health in the general population (Kessler 2003).

Below I summarize main findings from the moderation analyses.

RESULTS

In this section, I first turn my attention to the effects of stressors/resources on psychological distress, and the extent to which these are moderated by department characteristics – namely, the presence and structure of mentorship/advising programs, department climate (i.e., interaction between students and interaction between students and faculty), and graduate student funding (i.e., stipends and funding competition). In other words, I test whether the effect of stressors/resources on students' psychological distress varies at different levels of department characteristics. I begin by highlighting the main effect of each stressor on psychological distress, identified in the *Base Model* in

[33] Students who indicated that this question did not apply to their program were assigned a score of 0.

Tables 4.1-4.9. Then, I add each department characteristic, respectively, in Models 1-6, as an independent and multiplicative term, with controls. Therefore, each column represents a single moderation model, and each table represents a group of moderation models for a single relationship (stressor → psychological distress). Overall, there are almost no significant interactions (moderators) across the models. As such, analysis of the results will remain brief and attention will be centered on the few significant interactions, which themselves should be interpreted with caution as they could be significant by chance.

Department Characteristics as Moderators of the Relationship between Stressors/Resources and Psychological Distress

Time Constraints

In the *Base Model* of Table 4.1 it is evident that time constraints are a statistically significant predictor of students' psychological distress ($\beta=0.30$, $p<0.001$), indicating that students' struggles to fulfill work and personal obligations with limited time, is associated with higher psychological distress, controlling for sex, age and race. However, does the effect of time constraints on psychological distress vary at different levels of department characteristics? While Table 4.1 highlights six department characteristics, only student-initiated mentorship/advising programs show some evidence of moderation for the relationship between time constraints and psychological distress, which is only marginal. Specifically, in Model 2, the interaction term for student-initiated mentorship/advising programs and time constraints, ($\beta=0.11$, $p<0.10$), indicates that the effect of time constraints on psychological distress is exacerbated when students are in programs that require them to initiate mentorship/advising relationships. In other words, relative to students in programs with faculty-initiated mentorship/advising, students in programs with student-initiated

mentorship/advising will be more strongly affected by time constraints.[34] As a result, there are meaningful differences in the way time constraints manifest themselves in programs with student-initiated mentorship/advising. Aside from Model 2, no other department characteristic moderates the relationship between time constraints and psychological distress (Table 4.1).

Role Overload

Table 4.2 presents OLS coefficients for moderation models of the relationship between role overload and psychological distress. The direct effect of role overload on psychological distress is predictably deleterious (β=0.34, $p<0.001$, see Base Model), demonstrating that the greater students' responsibilities exceed their capacities, the more psychological distress they experience. However, there is no evidence that a single department characteristic moderates the relationship between role overload and psychological distress. While I expected department climate to have a notable impact on students' ability to navigate the strain of doctoral work, evidence does not support this notion. In Models 3 and 4, I test the hypotheses that department climate may moderate the effect of role overload on psychological distress. In other words, I assess whether interaction between students (Model 3) and interaction with faculty (Model 4) influence the effect of role overload on students' psychological distress. In Model 3, there is no evidence of a statistically significant interaction term (β=0.09, $p=0.14$) suggesting that interaction between students does not meaningfully impact the effect of role overload on psychological distress. In other words, the effect of role overload on psychological distress does not vary by levels of student interaction. Similarly, in Model 4, there is no significant interaction term (β=0.08, $p=0.19$), which suggests that the effect of role overload on psychological distress does not vary by interaction between students and faculty. Of the four

[34] Despite this finding, results should be interpreted with caution as they are significant at the p=0.10 level, which is a low benchmark given the sample size.

remaining department characteristics categorized in Table 4.2, there are no significant moderators of the relationship between role overload and psychological distress.

Role Conflict

Table 4.3 highlights coefficients for the moderation models of the relationship between role conflict and psychological distress. In Model 2, there is evidence that student-initiated mentorship/advising programs moderate the effect of role conflict on psychological distress. The interaction term (β=-0.11, $p<0.10$), suggests that while role conflict has a deleterious effect on psychological distress, as one would expect, being in a program where students initiate their own mentor/advising relationships, reduces this effect – i.e., because the interaction term (β=-0.11) is negative. This is in direct contrast to my expectations. Otherwise, in Table 4.3, no other department characteristic is a statistically significant moderator for the relationship between role conflict and psychological distress.

Isolation

Table 4.4 presents OLS regression coefficients for moderation models of the relationship between isolation and psychological distress. While the base model demonstrates isolation is a significant predictor of psychological distress, none of the department characteristics assessed are significant moderators of this relationship.

Funding Guarantee

Table 4.5 presents OLS regression coefficients for moderation models of the relationship between guaranteed funding and psychological distress. As the base model demonstrates, guaranteed funding

is not a significant predictor of psychological distress, and additionally, none of the department characteristics assessed are significant moderators of this relationship.

Funding Confidence

Table 4.6 highlights findings from OLS regression, moderation models for the relationship between funding confidence and psychological distress. As a reminder, funding confidence is a measure of students' confidence in their financial position to complete graduate study. The measure is coded such that greater confidence should be associated with lower psychological distress, which the base model confirms. However, none of the department characteristics assessed are significant moderators of this relationship.

Faculty Support

Table 4.7 presents OLS regression coefficients for the moderation models of the relationship between faculty support and psychological distress. The base model demonstrates that faculty support is a statistically significant predictor of psychological distress such that greater faculty support (by means of mentors/advisers) is associated with lower students' psychological distress. Nevertheless, none of the department characteristics assessed are significant moderators of this relationship, which means that the beneficial effect of faculty support on psychological distress does not vary by the existence of a formal mentorship/advising program, student-initiated mentorship/advising, department climate (interaction between students and interaction between students and faculty), stipend values and/or funding competition.

Mentor/Adviser Satisfaction

Table 4.8 presents OLS regression coefficients for moderation models of the relationship between mentor/adviser satisfaction and students' psychological distress. In the first column, the Base Model demonstrates that students' greater satisfaction with their mentor/adviser, contributes to lower psychological distress (β=-0.18, $p<0.05$), when controlling for sex, age and race. In Model 3, which assesses the extent to which interaction with graduate students moderates the relationship between mentor/adviser satisfaction and psychological distress, the coefficient for the interaction is marginally significant (β=-0.33, $p<0.10$). This suggests that the beneficial impact of mentor/adviser satisfaction on psychological distress may be aided by greater interaction with graduate students, such that psychological distress is lower. However, no other department characteristics moderate the relationship between mentor/adviser satisfaction and psychological distress.

Mentorship/Advising Relationships

Table 4.9 presents OLS regression coefficients for moderation models of the association between mentor/adviser relationships and psychological distress. As a reminder, the variable *mentor/adviser relationships,* measures the content of student-faculty relationships, beyond mere satisfaction. Specifically, it captures the extent to which students feel their mentor/adviser provides emotional and informational support for their career, and advocates for their interests. As the Base Model confirms, I hypothesize that higher assessments of mentor/adviser relationships contribute to lower psychological distress (β=-0.27, $p<0.001$), controlling for sex, age and race. Regarding moderation, I find that the effect of mentor/adviser relationships on psychological distress varies by interaction with graduate students (Model 3). Particularly, with interaction between graduate students (a measure of department climate), the effect of assessments of one's mentoring/advising relationship on reducing psychological distress is larger (β=-0.32, $p<0.05$). Therefore, it is especially advantageous for students' psychological distress to have good relationships with one's

mentor/adviser, while in a department that supports interaction between students. In a similar vein, Model 5, which assesses the extent to which stipend values moderate the relationship between mentor/advising relationships and psychological distress, demonstrates a marginally significant, interaction term (β=-0.05, $p<0.10$). This suggests that at higher stipend values, the effect of students' relationships with mentors/advisers on psychological distress, is larger. Therefore, both greater interaction between graduate students and higher stipend values have a beneficial impact on graduate students' mental health experiences, in that they magnify the inverse relationship between mentor/advising relationships with psychological distress.

Socio-Demographic Factors as Moderators of the Relationship between Stressors/Resources and Psychological Distress

Next, I turn my attention to socio-demographic factors as moderators of the relationship outlined above – i.e., the relationship between stressors/resources and psychological distress. Tables 4.10-4.11 depict the relevant OLS coefficients. As previously outlined, of the nine stressors/resources utilized from the GSSC, all except guaranteed funding are significant predictors of psychological distress. In addition, these stressors/resources predict psychological distress in the directions hypothesized. For example, while time constraints, role overload, role conflict and isolation are associated with higher psychological distress; funding confidence, faculty support, mentor/adviser satisfaction and the quality of mentor/adviser relationships are linked to better mental health (i.e. lower psychological distress.) The question remains, however, do these relationships vary by students' gender and race/ethnicity? With few exceptions, the overwhelming answer is no.

Gender

Table 4.10, Models 1 and 7 demonstrate the only relationships between stressors/resources and psychological distress for which gender is a moderator. In Table 4.1, *Base Model*, we are reminded that the relationship between time constraints and psychological distress is significant (β=0.30, $p<0.001$). Specifically, students' experiences of time constraints contribute to greater psychological distress, controlling for sex, age and race. In testing the hypothesis that female graduate students experience a greater burden of time constraints on their psychological distress (relative to males), we turn to Table 4.10, Model 1. Here we find that female graduate students bear an additional, albeit marginally significant burden of time constraints on psychological distress, relative to their male counterparts (β=0.11, $p<0.10$). In other words, the effect of time constraints on psychological distress is larger for female graduate students than it is for males. Nevertheless, this result should be interpreted with caution as it is within the realm of chance.

In Model 7 (Table 4.10), we see that faculty support has varied benefits for the psychological distress of male and female graduate students. As a reminder, I expect female graduate students to garner greater benefits from faculty support, regarding their psychological distress outcomes, particularly because of the sexism female students may experience in male-dominated fields, and in academia more broadly. At a basic level, faculty support reduces the psychological distress students experience, as evidenced by the *Base Model* in Table 4.7. Specifically, having faculty support (in the form of a mentor and/or adviser), reduces students' psychological distress (β=-0.47, $p<0.001$). Model 7, Table 4.10 demonstrates that faculty support has a greater benefit for female graduate students regarding their psychological distress, than it does their male counterparts. While only marginally significant, evidence suggests that female graduate students have lower psychological distress than their male counterparts when supported by faculty (β=-0.44, $p<0.10$).

Race/Ethnicity

Regarding race/ethnicity, I expected White graduate students, relative to their racial/ethnic minority counterparts, to experience smaller effects of the deleterious stressors (namely, time constraints, role overload, role conflict and isolation) and garner greater benefits from funding confidence, faculty support, mentor/adviser satisfaction and quality mentor/adviser relationships. In this manner, I expected graduate students' stress experiences to unfold consistently with broader structures of inequality. In Table 4.11, Model 5 – *funding guarantee* – provides marginal evidence of moderation by race/ethnicity. Specifically, evidence suggests the difference in distress between those with and without a funding guarantee is larger for whites than for students of color (β=-0.48, p=0.06). In no other models does race/ethnicity moderate the relationship between stressors/resources and psychological distress.

Socio-Demographic Factors as Moderators of the Relationship between Department Characteristics and Psychological Distress

Lastly, I turn my attention to the effects of department characteristics on psychological distress, and the extent to which these are moderated by students' socio-demographic backgrounds – namely, gender and race/ethnicity. In other words, I test whether the effect of department characteristics – i.e., mentorship/advising programs, department climate and funding – on students' psychological distress varies for women and men, and for racial/ethnic minorities and their White counterparts. As a reminder, the main effect of each department characteristic on psychological distress is identified in Table 3.6 – Chapter 3. Table 4.12 details the moderation models for gender, with each column representing a single relationship (department characteristics→ psychological distress). Table 4.13 details the moderation models for race/ethnicity, with each column representing a single relationship (department characteristics→ psychological distress). In Model 2, evidence suggests that the difference in distress between those in programs with student-initiated mentorship/advising versus

those in faculty-initiated programs, is larger for white students than racial/ethnic minority students (β=-0.48, $p<0.10$). Otherwise, there are no significant interactions (moderators) across the models for both tables.

DISCUSSION

In this chapter, I assessed three moderation models: 1) whether department characteristics moderated the relationship between stressors/resources and psychological distress, 2) whether gender and race/ethnicity moderated the relationship between stressors/resources and psychological distress, and 3) whether gender and race/ethnicity moderated the relationship between department characteristics and psychological distress. Very little moderation was observed. One notable moderator was evidenced by statistical significance: Students are less distressed when they have good relationships with mentors/advisers, and garner additional benefits if this occurs in a supportive department climate. Regarding students' socio-demographic backgrounds – gender and race/ethnicity – faculty support has greater benefits for female graduate students' psychological distress (marginal effect), than for male graduate students, yet, female graduate students have greater burden on their psychological distress from time constraints than do males (marginal effect). In addition, white students experience a larger decrease in their psychological distress than racial/ethnic minority students when there is guaranteed funding (marginal effect) and student-initiated mentorship/advising (marginal effect). No other evidence of moderation was observed.

The evidence here points to a mismatch between my hypotheses and the quantitative findings. Regarding department characteristics, it is unsurprising that the structure of mentorship/advising does not moderate the relationship between stressors and psychological distress, because on its own, it is not a statistically significant predictor of psychological distress. As this department-level variable has failed to yield results consistent with my hypotheses in both the

mediation models (of Chapter 3) and most of the moderation models of this chapter, I have concerns about reliability and validity of the variable itself, which was added to the GSSC post-hoc. My concerns are primarily methodological, in that the data collected and coded for the variable were combined from two sources – department websites and email responses from department administrators. It is possible that "formal program" and "student-initiated mentorship/advising" has multiple interpretations for department administrators and/or has little or no meaning to the stress experiences of graduate students; or both. As such, evidence that the relationship between student-initiated mentorship/advising and psychological distress is moderated (marginally) by race/ethnicity, should be interpreted with caution.[35]

It is also possible that the data here are limited in explaining the stress experiences of minority subsets (particularly students of color) within the relatively homogenous graduate population. Just as we understand exposure and vulnerability to stressors, as well as access to support resources as delineated by social contexts and structures of inequality, so too are the individuals who participate in social contexts (Brown 2013). In this case, the student population who choose to and have the opportunity to pursue doctoral education are a unique subset of the general population. As scholars have noted, students who go to graduate school are disproportionately female, from high-income backgrounds, and White (Mattern 2015). While the moderation models presented in this chapter control for sex, age and race, they do not for socio-economic background, marital status and other factors which bear consideration. These may not fully explain the weak moderation from gender and race/ethnicity, but it is possible that some homogeneity in the graduate student population and a small subset population of minority students – namely students of color – contributes to greater differentiation in psychological distress experiences by stressors and resources, than socio-demographic factors.

[35] Please see a discussion of these concerns in Chapter 6.

Table 4.1: Coefficients for OLS Regressions of Psychological Distress on Time Constraints with Department Characteristics as Moderators

	Variables	**Base Model**	**Model 1** *Formal Program*	**Model 2** *Student-Initiated*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Stressors/ Resources								
	Time Constraints	0.30*** (0.03)	0.30** (0.09)	0.28*** (0.04)	0.35*** (0.06)	0.28*** (0.05)	0.23 (-0.17)	0.22** (0.07)
Department Characteristics								
Formal Program	Formal program		0.004 (0.39)					
	Formal Program X Time Constraints		0.01 (0.09)					
Student-initiated	Student-initiated			-0.22 (0.25)				
	Student-initiated X Time Constraints			0.11+ (0.06)				
Interaction with Students	Interaction with students				0.14 (0.28)			
	Interaction with students X Time Constraints				-0.06 (0.07)			
Interaction with Faculty	Interaction with faculty					-0.20 (0.24)		
	Interaction with faculty X Time Constraints					-0.20 (0.24)		

Stipend	Stipend						-0.02 (0.04)	
	Stipend X Time Constraints						0.01 (0.01)	
Funding Competition	Funding competition							-0.03 (0.10)
	Funding Competition X Time Constraints							0.03 (0.03)
	Controls							
	Sex (Female=1)	0.11 (0.07)	0.09 (0.07)	0.05 (0.07)	0.10 (0.07)	0.10 (0.07)	0.12+ (0.07)	0.08 (0.07)
	Age	-0.01+ (0.004)	-0.01* (0.01)	-0.01+ (0.01)	-0.01+ (0.004)	-0.01+ (0.004)	-0.01 (0.01)	-0.01** (0.01)
	Race (White=1)	-0.20+ (0.11)	-0.19+ (0.11)	-0.16 (0.11)	-0.19+ (0.11)	-0.19+ (0.11)	-0.21+ (0.12)	-0.20+ (0.11)
	N	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.2: Coefficients for OLS Regressions of Psychological Distress on Role Overload with Department Characteristics as Moderators

	Variables	**Base Model**	**Model 1** *Formal Program*	**Model 2** *Student-Initiated*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Stressors/ Resources	Role Overload	0.34***	0.33***	0.33***	0.27***	0.28***	0.31*	0.31***
		(0.03)	(0.08)	(0.03)	(0.06)	(0.05)	(0.15)	(0.07)
Department Characteristics								
Formal Program	Formal program		-0.10					
			(0.22)					
	Formal Program X Role Overload		0.02					
			(0.08)					
Student-initiated	Student-initiated			-0.15				
				(0.16)				
	Student-initiated X Role Overload			0.07				
				(0.06)				
Interaction with Students	Interaction with students				-0.34*			
					(0.18)			
	Interaction with students X Role Overload				0.09			
					(0.06)			
Interaction with Faculty	Interaction with faculty					-0.28+		
						(0.16)		
	Interaction with faculty X Role Overload					0.08		
						(0.06)		
Stipend	Stipend						-0.01	
							(0.03)	

	Stipend X Role Overload						0.003 (0.009)	
Funding Competition	Funding competition							0.02 (0.06)
	Funding CompetitionX Role Overload							0.01 (0.02)
	Controls							
	Sex (Female=1)	0.08 (0.06)	0.06 (0.06)	0.03 (0.07)	0.08 (0.06)	0.08 (0.06)	0.07 (0.07)	0.06 (0.06)
	Age	-0.005 (0.005)	-0.01 (0.004)	-0.004 (0.005)	-0.01 (0.004)	-0.01 (0.005)	-0.004 (0.006)	-0.01+ (0.004)
	Race (White=1)	-0.10 (0.10)	-0.11 (0.10)	-0.08 (0.11)	-0.09 (0.10)	-0.10 (0.10)	-0.10 (0.11)	-0.10 (0.10)
	N	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.3: Coefficients for OLS Regressions of Psychological Distress on Role Conflict with Department Characteristics as Moderators

	Variables	**Base Model**	**Model 1** *Formal Program*	**Model 2** *Student-Initiated*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Stressors/ Resources	Role Conflict	0.22*** (0.03)	0.13 (0.08)	0.28*** (0.03)	0.17** (0.06)	0.16*** (0.05)	0.22 (0.16)	0.15* (0.07)
Department Characteristics								
Formal Program	Formal program		-0.24 (0.24)					
	Formal Program X Role Conflict		0.11 (0.08)					
Student-initiated	Student-initiated			0.31* (0.16)				
	Student-initiated X Role Conflict			-0.11+ (0.06)				
Interaction with Students	Interaction with students				-0.27 (0.18)			
	Interaction with students X Role Conflict				0.07 (0.06)			
Interaction with Faculty	Interaction with faculty					-0.29+ (0.16)		
	Interaction with faculty X Role Conflict					0.08 (0.06)		
Stipend	Stipend						-0.003 (0.026)	

	Stipend X Role Conflict						0.001 (0.01)	
Funding Competition	Funding competition							0.02 (0.06)
	Funding Competition X Role Conflict							0.03 (0.02)
	Controls							
	Sex (Female=1)	0.12+ (0.07)	0.10 (0.07)	0.09 (0.07)	0.12+ (0.07)	0.11 (0.07)	0.13+ (0.08)	0.09 (0.07)
	Age	-0.01 (0.01)	-0.01* (0.01)	-0.01 (0.01)	-0.01+ (0.01)	-0.01+ (0.01)	-0.01 (0.01)	-0.01** (0.01)
	Race (White=1)	-0.25* (0.11)	-0.24* (0.11)	-0.21+ (0.11)	-0.23* (0.11)	-0.24* (0.11)	-0.22+ (0.12)	-0.25* (0.11)
	N	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.4: Coefficients for OLS Regressions of Psychological Distress on Isolation with Department Characteristics as Moderators

	Variables	**Base Model**	**Model 1** *Formal Program*	**Model 2** *Student-Initiated*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Stressors/ Resources	Isolation	0.44*** (0.04)	0.34** (0.13)	0.41*** (0.05)	0.39*** (0.10)	0.48*** (0.08)	0.11 (0.22)	0.37*** (0.10)
Department Characteristics								
Formal Program	Formal program		-0.25 (0.32)					
	Formal Program X Isolation		0.11 (0.14)					
Student-initiated	Student-initiated			-0.17 (0.20)				
	Student-initiated X Isolation			0.09 (0.09)				
Interaction with Students	Interaction with students				-0.14 (0.27)			
	Interaction with students X Isolation				0.06 (0.10)			
Interaction with Faculty	Interaction with faculty					0.11 (0.22)		
	Interaction with faculty X Isolation					-0.06 (0.09)		
Stipend	Stipend						-0.05	

							(0.03)	
	Stipend X Isolation						0.02 (0.01)	
Funding Competition	Funding competition							0.002 (0.08)
	Funding Competition X Isolation							0.02 (0.04)
	Controls							
	Sex (Female=1)	0.14* (0.07)	0.11+ (0.07)	0.10 (0.07)	0.14* (0.07)	0.14* (0.07)	0.13+ (0.07)	0.12* (0.07)
	Age	-0.01** (0.004)	-0.02*** (0.004)	-0.01** (0.01)	-0.02** (0.005)	-0.01** (0.005)	-0.02** (0.01)	-0.02*** (0.01)
	Race (White=1)	-0.19+ (0.10)	-0.20+ (0.11)	-0.16 (0.11)	-0.19+ (0.11)	-0.19+ (0.11)	-0.26* (0.12)	-0.19+ (0.10)
	N	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.5: Coefficients for OLS Regressions of Psychological Distress on Guaranteed Funding with Department Characteristics as Moderators

	Variables	**Base Model**	**Model 1** *Formal Program*	**Model 2** *Student-Initiated*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Stressors/ Resources	Funding Guarantee	-0.04	-0.56	-0.04*	0.18	0.09	0.78	0.23
		(0.09)	(0.48)	(0.11)	(0.18)	(0.17)	(0.71)	(0.29)
Department Characteristics								
Formal Program	Formal program		-0.56					
			(0.47)					
	Formal Program X Funding Guarantee		0.56					
			(0.48)					
Student-initiated	Student-initiated			-0.06				
				(0.19)				
	Student-initiated X Funding Guarantee			0.12				
				(0.21)				
Interaction with Students	Interaction with students				0.05			
					(0.17)			
	Interaction with students X Funding Guarantee				-0.27			
					(0.20)			
Interaction with Faculty	Interaction with faculty					-0.002		
						(0.17)		
	Interaction with faculty X Funding Guarantee					-0.18		
						(0.19)		
Stipend	Stipend						0.04	
							(0.05)	

	Stipend X Funding Guarantee						-0.06 (0.05)	
Funding Competition	Funding competition							0.16* (0.08)
	Funding Competition X Funding Guarantee							-0.05 (0.09)
	Controls							
	Sex (Female=1)	0.17* (0.07)	0.15* (0.07)	0.15+ (0.08)	0.16* (0.07)	0.16* (0.07)	0.19* (0.08)	0.14* (0.07)
	Age	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01+ (0.01)
	Race (White=1)	-0.21+ (0.12)	-0.22+ (0.12)	-0.18 (0.12)	-0.19 (0.12)	-0.19+ (0.12)	-0.21 (0.13)	-0.20+ (0.12)
	N	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.6: Coefficients for OLS Regressions of Psychological Distress on Funding Confidence with Department Characteristics as Moderators

	Variables	**Base Model**	**Model 1** *Formal Program*	**Model 2** *Student-Initiated*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Stressors/ Resources	Funding Confidence	-0.22***	-0.17	-0.22***	-0.15+	-0.18**	-0.23	-0.26*
		(0.04)	(0.12)	(0.05)	(0.08)	(0.07)	(0.23)	(0.11)
Department Characteristics								
Formal Program	Formal program		0.18					
			(0.28)					
	Formal Program X Funding Uncertainty		-0.05					
			(0.12)					
Student-initiated	Student-initiated			0.05				
				(0.28)				
	Student-initiated X Funding Uncertainty			-0.01				
				(0.09)				
Interaction with Students	Interaction with students				0.15			
					(0.27)			
	Interaction with students X Funding Uncertainty				-0.08			
					(0.09)			
Interaction with Faculty	Interaction with faculty					0.05		
						(0.25)		
	Interaction with faculty X Funding Uncertainty					-0.05		
						(0.08)		
Stipend	Stipend						0.001	
							(0.05)	

	Stipend X Funding Uncertainty						-0.001 (0.01)	
Funding Competition	Funding competition							0.01 (0.11)
	Funding Competition X Funding Uncertainty							0.02 (0.03)
	Controls							
	Sex (Female=1)	0.14* (0.07)	0.13+ (0.07)	0.11 (0.08)	0.13+ (0.07)	0.13+ (0.07)	0.16* (0.08)	0.12+ (0.07)
	Age	-0.01* (0.01)	-0.01* (0.01)	-0.01* (0.01)	-0.01* (0.01)	-0.01* (0.01)	-0.01 (0.01)	-0.01** (0.01)
	Race (White=1)	-0.16 (0.11)	-0.15 (0.12)	-0.12 (0.12)	-0.15 (0.11)	-0.16 (0.11)	-0.15 (0.12)	-0.16 (0.11)
	N	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.7: Coefficients for OLS Regressions of Psychological Distress on Faculty Support with Department Characteristics as Moderators

	Variables	**Base Model**	**Model 1** *Formal Program*	**Model 2** *Student-Initiated*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Stressors/ Resources	Faculty Support	-0.47*** (0.14)	-0.53* (0.26)	-0.41* (0.22)	-0.41+ (0.25)	-0.27 (0.20)	-1.60 (1.12)	-0.63* (0.33)
Department Characteristics								
Formal Program	Formal program		-0.05 (0.28)					
	Formal Program X Faculty Support		0.11 (0.31)					
Student-initiated	Student-initiated			0.03 (0.34)				
	Student-initiated X Faculty Support			0.001 (0.35)				
Interaction with Students	Interaction with students				-0.08 (0.28)			
	Interaction with students X Faculty Support				-0.06 (0.30)			
Interaction with Faculty	Interaction with faculty					0.21 (0.26)		
	Interaction with faculty X Faculty Support					-0.34 (0.27)		
Stipend	Stipend						-0.08 (0.07)	
	Stipend X Faculty Support						0.08 (0.07)	

Funding Competition	Funding competition							0.05 (0.12)
	Funding Competition X Faculty Support							0.07 (0.12)
	Controls							
	Sex (Female=1)	0.19** (0.07)	0.18* (0.07)	0.17* (0.08)	0.18** (0.07)	0.18* (0.07)	0.20** (0.08)	0.16* (0.07)
	Age	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01+ (0.01)
	Race (White=1)	-0.20+ (0.12)	-0.19 (0.12)	-0.17 (0.12)	-0.18 (0.12)	-0.19 (0.12)	-0.19 (0.13)	-0.18 (0.12)
	N	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.8: Coefficients for OLS Regressions of Psychological Distress on Mentor/Adviser Satisfaction with Department Characteristics as Moderators

	Variables	**Base Model**	**Model 1** *Formal Program*	**Model 2** *Student-Initiated*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Stressors/ Resources	Men/Adv Satisfaction	-0.18*	-0.05	-0.21*	0.09	-0.05	0.18	-0.17
		(0.08)	(0.25)	(0.10)	(0.17)	(0.15)	(0.48)	(0.21)
Department Characteristics								
Formal Program	Formal program		0.15					
			(0.22)					
	Formal Program X Men/Adv Satisfaction		-0.14					
			(0.27)					
Student-initiated	Student-initiated			0.0003				
				(0.16)				
	Student-initiated X Men/Adv Satisfaction			0.06				
				(0.19)				
Interaction with Students	Interaction with students				0.08			
					(0.15)			
	Interaction with students X Men/Adv Satisfaction				-0.33+			
					(0.19)			
Interaction with Faculty	Interaction with faculty					-0.02		
						(0.14)		
	Interaction with faculty X Men/Adv Satisfaction					-0.16		
						(0.17)		
Stipend	Stipend						0.01	
							(0.03)	

	Stipend X Men/Adv Satisfaction						-0.02 (0.03)	
Funding Competition	Funding competition							0.11+ (0.06)
	Funding Competition X Men/Adv Satisfaction							0.002 (0.07)
	Controls							
	Sex (Female=1)	0.15* (0.08)	0.14+ (0.08)	0.13 (0.08)	0.14+ (0.08)	0.15* (0.08)	0.17* (0.08)	0.13+ (0.08)
	Age	-0.01+ (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01+ (0.01)	-0.01+ (0.01)	-0.01 (0.01)	-0.01* (0.01)
	Race (White=1)	-0.21+ (0.12)	-0.21+ (0.12)	-0.19 (0.13)	-0.20+ (0.12)	-0.21+ (0.12)	-0.22 (0.14)	-0.19 (0.12)
	N	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.9: Coefficients for OLS Regressions of Psychological Distress on Mentor/Adviser Relationship with Department Characteristics as Moderators

	Variables	**Base Model**	**Model 1** *Formal Program*	**Model 2** *Student-Initiated*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Stressors/ Resources	Men/Adv Relationship	-0.27***	-0.31	-0.26**	-0.002	-0.28*	0.51	-0.25
		(0.06)	(0.21)	(0.08)	(0.14)	(0.12)	(0.42)	(0.18)
Department Characteristics								
	Formal program		-0.12					
			(0.66)					
Formal Program	Formal Program X Men/Adv Relationship		0.07					
			(0.22)					
	Student-initiated			-0.15				
				(0.47)				
Student-initiated	Student-initiated X Men/Adv Relationship			0.06				
				(0.15)				
	Interaction with students				0.79+			
					(0.46)			
Interaction with Students	Interaction with students X Men/Adv Relationship				-0.32*			
					(0.16)			
	Interaction with faculty					-0.18		
						(0.41)		
Interaction with Faculty	Interaction with faculty X Men/Adv Relationship					0.03		
						(0.15)		
	Stipend						0.12	
							(0.08)	
Stipend	Stipend X Men/Adv Relationship						-0.05+	
							(0.03)	

Funding Competition	Funding competition							0.10 (0.18)
	Funding Competition X Men/Adv Relationship							-0.002 (0.06)
	Controls							
	Sex (Female=1)	0.15* (0.08)	0.14+ (0.08)	0.15+ (0.09)	0.15+ (0.08)	0.15+ (0.08)	0.16+ (0.09)	0.14+ (0.08)
	Age	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01	-0.01 (0.01)	0.0002 (0.01)	-0.01 (0.01)
	Race (White=1)	-0.10 (0.13)	-0.09 (0.13)	-0.06 (0.14)	-0.09 (0.13)	-0.10 (0.13)	-0.11 (0.14)	-0.09 (0.13)
	N	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.10: Coefficients for OLS Regressions of Psychological Distress on Stressors/Resources Moderated by Gender

	Variables	**Model 1** *Time Constraints*	**Model 2** *Role Overload*	**Model 3** *Role Conflict*	**Model 4** *Isolation*	**Model 5** *Funding Guarantee*	**Model 6** *Funding Confidence*	**Model 7** *Faculty Support*	**Model 8** *Mentor/Adviser Satisfaction*	**Model 9** *Mentor/Adviser Relationship*
Stressors /Resources		0.23*** (0.05)	0.34*** (0.04)	0.20*** (0.05)	0.37*** (0.06)	-0.02 (0.15)	-0.13* (0.07)	-0.23 (0.20)	-0.02+ (0.14)	-0.23+ (0.12)
Socio-Demographic Characteristics										
Gender	Female X Stressors/Resources	0.11+ (0.06)	0.001 (0.05)	0.05 (0.05)	0.12 (0.08)	-0.03+ (0.18)	-0.12 (0.08)	-0.44+ (0.27)	-0.23 (0.17)	-0.05 (0.14)
	Controls									
	Sex (Female=1)	-0.18 (0.17)	0.08 (0.14)	0.01 (0.14)	-0.12 (0.18)	0.19 (0.16)	0.51* (0.26)	0.60* (0.26)	0.31* (0.14)	0.30 (0.42)
	Age	-0.01+ (0.01)	-0.01 (0.01)	-0.01+ (0.01)	-0.01** (0.01)	-0.01 (0.01)	-0.01+ (0.01)	-0.01 (0.01)	-0.01+ (0.01)	-0.01 (0.01)
	Race (White=1)	-0.19+ (0.11)	-0.10 (0.10)	-0.25* (0.11)	-0.20* (0.11)	-0.21+ (0.12)	-0.16 (0.11)	-0.21+ (0.12)	-0.22+ (0.12)	-0.10 (0.13)
	N	540	540	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.11: Coefficients for OLS Regressions of Psychological Distress on Stressors/Resources Moderated by Race/Ethnicity

	Variables	**Model 1** *Time Constraints*	**Model 2** *Role Overload*	**Model 3** *Role Conflict*	**Model 4** *Isolation*	**Model 5** *Funding Guarantee*	**Model 6** *Funding Confidence*	**Model 7** *Faculty Support*	**Model 8** *Mentor/Adviser Satisfaction*	**Model 9** *Mentor/Adviser Relationship*
Stressors /Resources		0.25** (0.10)	0.44** (0.10)	0.29*** (0.08)	0.43*** (0.11)	0.38 (0.24)	-0.26* (0.12)	0.40 (0.38)	-0.45+ (0.26)	-0.48* (0.21)
Socio-Demographic Characteristics										
Race/Ethnicity	Race X Stressors/Resources	0.06 (0.10)	-0.10 (0.10)	-0.07 (0.08)	0.01 (0.12)	-0.48+ (0.26)	0.05 (0.13)	-0.08 (0.40)	0.31 (0.27)	0.06 (0.10)
	Controls									
	Sex (Female=1)	0.11 (0.07)	0.08 (0.06)	0.12+ (0.07)	0.14* (0.07)	0.17* (0.07)	0.14* (0.07)	0.19** (0.07)	0.15* (0.08)	0.15+ (0.08)
	Age	-0.01+ (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01** (0.01)	-0.01 (0.01)	-0.01* (0.01)	-0.01 (0.01)	-0.01+ (0.01)	-0.01 (0.01)
	Race (White=1)	-0.35 (0.30)	0.17 (0.29)	-0.09 (0.22)	-0.21 (0.28)	0.13 (0.22)	-0.32 (0.39)	-0.12 (0.39)	-0.43+ (0.23)	-0.77 (0.65)
	N	540	540	540	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.12: Coefficients for OLS Regressions of Psychological Distress on Department Characteristics Moderated by Gender

	Variables	**Model 1** *Mentorship/Advising Program*	**Model 2** *Student-initiated Mentorship/Advising*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Department Characteristics		0.05	0.05	-0.01	-0.06	-0.03	0.06
		(0.22)	(0.13)	(0.15)	(0.14)	(0.02)	(0.06)
Socio-Demographic Characteristics							
Gender	Female X Department Characteristics	0.10	-0.03	-0.23	0.12	0.03	0.06
		(0.25)	(0.17)	(0.19)	(0.17)	(0.03)	(0.07)
	Controls						
	Sex (Female=1)	0.14+	0.16	0.35*	0.14	-0.25	-0.01
		(0.08)	(0.10)	(0.17)	(0.08)	(0.46)	(0.19)
	Age	-0.01	-0.01	-0.01	-0.01	-0.004	-0.01+
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	Race (White=1)	-0.21+	-0.19	-0.18	-0.19+	-0.21+	-0.20+
		(0.12)	(0.12)	(0.12)	(0.12)	(0.13)	(0.12)
	N	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4.13: Coefficients for OLS Regressions of Psychological Distress on Department Characteristics Moderated by Race/Ethnicity

	Variables	**Model 1** *Mentorship/Advising Program*	**Model 2** *Student-initiated Mentorship/Advising*	**Model 3** *Interaction with Students*	**Model 4** *Interaction with Faculty*	**Model 5** *Stipend*	**Model 6** *Funding Competition*
Department Characteristics		-0.73	0.48+	0.09	-0.04	0.01	0.02
		(0.58)	(0.28)	(0.24)	(0.24)	(0.04)	(0.11)
Socio-Demographic Characteristics							
Race/Ethnicity	Race X Department Characteristics	-0.73	-0.48+	-0.29	0.12	-0.02	0.09
		(0.59)	(0.29)	(0.26)	(0.25)	(0.05)	(0.11)
	Controls						
	Sex (Female=1)	0.15*	0.15+	0.16*	0.17*	0.19*	0.14*
		(0.07)	(0.08)	(0.07)	(0.07)	(0.08)	(0.07)
	Age	-0.01	-0.01	-0.01	-0.01	-0.004	-0.01+
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	Race (White=1)	-0.18	-0.07	0.02	-0.24+	-0.19	-0.44
		(0.12)	(0.14)	(0.21)	(0.14)	(0.70)	(0.33)
	N	540	540	540	540	540	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

CHAPTER FIVE:

GRADUATE STUDENTS' STRESS EXPERIENCES THROUGHOUT DOCTORAL STUDY

In this chapter, I investigate how and to what extent doctoral students understand their experiences in graduate school as stressful, and whether they link these experiences to features of their home departments. Drawing from 32 qualitative interviews conducted with doctoral students from the Natural & Mathematical Sciences, Arts & Humanities and Social Sciences, the findings presented extend the quantitative analyses by drawing attention to unforeseen stressors/resources, and highlight the mechanisms by which doctoral students come to experience and understand their own stress.

Findings are organized into three broad sections. First, I detail main patterns from the qualitative interviews related to competition – both for funding and status. Within this section, I highlight the emergence of key themes related to fairness and clarity – a concern amongst students regarding funding structure. Second, I highlight the importance of transparency, including students' accounts of stress stemming from a lack of clear expectations and hidden curriculum. Lastly, I summarize findings from the most common stressors/resources students report experiencing, drawing attention to divisional differences, where they arise. Namely, I describe students' experiences of imposter syndrome, mentorship/advising challenges and "playing defense". Where appropriate, I point to areas of consistency and differentiation between student accounts from the qualitative interviews and quantitative findings from the GSSC.

METHODS

The qualitative interviews are designed to better understand how and in what ways students' contextualize their stress experiences in graduate departments. I devote special attention to the way students perceive department climate and training as related to stress, including their social and

academic relationships with faculty and colleagues. In the process, students identify several new sources of stress that are not discussed in previous literature.

Sampling Strategy and Sample Size

I conducted 32 one-on-one, in-depth interviews, with full-time, doctoral students. Students from three divisions are represented – 11 from the Natural & Mathematical Sciences, 8 from the Arts & Humanities, and 12 from the Social Sciences.[36] Interview sessions were between 60-90 minutes and scheduled at dates and times amenable to the participants' schedule. All students who scheduled and completed an interview with me were given a $10 Target Gift Card for their participation.

INTERVIEWS

Using a semi-structured interviewing strategy, I asked open-ended questions and probes to assess participants' experiences with key research themes, including mentorship/advising, funding, department climate, and isolation. In the interest of parsimony, these themes are captured in the 14 questions below (Appendix B: Interview Guide). All interviews were audio recorded, transcribed and coded for key themes.

RESULTS

Within this chapter, I will focus on three areas which yield new information and/or complement the quantitative findings from Chapters 3 and 4 – competition, transparency and graduate stressors/resources .[37] These themes are of primary interest because they relate, in part, to the

[36] For more information on the sampling strategy, eligibility criteria, interview guide, incentive structure, etc., please see the appendices in Chapter 2.

[37] Although all interviews were transcribed, I coded 27 interviews for inclusion in this chapter, having reached saturation in the key themes addressed above. Based on notes taken during and after each interview, there is close correspondence between the themes present in the coded and uncoded interviews. Thus, it is unlikely that the themes identified here are unique to the coded transcripts.

weakest areas of the GSSC survey, are especially prevalent in the qualitative interviews, and/or address central foci in my research questions (listed above).

Competition

Findings from the survey data in Chapter 3 reveal that funding competition, a department-level characteristic, is detrimental for students' psychological distress. Nevertheless, there is no evidence to suggest that funding competition mediates the relationship between division membership and psychological distress. Illuminated in the qualitative interviews, students describe funding competition as a pervasive and stressful component of their graduate experiences. However, students highlight three additional and complementary themes regarding competition – 1) funding competition has a deleterious impact on the social climate students experience in their departments; 2) students' grievances about funding competition are related to broader concerns with *fairness* and *transparency*, and 3) students also compete for status and rank within their departments. In the first theme, students highlight the direct impact of competition for scarce department funding on their relationships with colleagues. In the second, students' objections to funding competition reveal questions and concerns about the fairness and clarity with which department funding is allocated. Some specifically highlight a lack of clear and comprehensive criteria upon which funding decisions are made, and others question whether funding is, or even should be, allocated based on merit. In the third and final theme, students also reveal that competition, more broadly, occurs amongst students for non-monetary rewards, such as status and rank. Each of these themes complement and/or expand on the quantitative analysis, providing a greater understanding of the academic, social and stress experiences of graduate students.

Funding Competition: Graduate Student Experiences

The information doctoral interviewees provide about funding competition is elicited from two questions in the interview guide. The first asks students to reflect upon and provide insight regarding a central finding from the GSSC survey – namely, the finding that greater funding competition is linked to greater psychological distress. The second asks students to describe the social climate in their department. Consistent with the quantitative findings in Chapter 3, students report that funding competition is prevalent in their departments, and that this competition is stressful. In fact, a substantial proportion of graduate students describe facing inadequate financial support to meet various academic and non-academic needs, creating competition amongst colleagues. For example, Nick (31), describes funding in a Social Science Department:

> Our student body is responding to a very different type of need – there's much [*sic*] fewer resources, teaching positions are more competitive, conference money is competitive. At [a Professional School], we're guaranteed $600 per semester conference funding. For [the Social Science Department], it's much more competitive. We get very little funding.

Nick, a dual PhD student, has the unique advantage of understanding experiences of funding competition in two programs, simultaneously. In both absolute and relative terms, he describes the limited resources in the Social Science Department to which he belongs, to cover expenses associated with conference travel.

Other students detail funding scarcity beyond travel support. As Janet (28), from the Arts & Humanities remarks, there is also intense competition for department fellowships:

> So pretty much it's like two fellowships for a lot of people, so it does make things very competitive. I mean one thing that's been helpful is that people have been getting fellowships outside of the department, which have helped people in the department a lot, because people don't get cut off from funding as early, as there are other people getting outside funding. But it's very competitive for those very few fellowships.

Here, Janet agrees that limited resources are available for the numerous candidates who apply for department fellowships, but her assessment of funding competition has further implications. For example, she is acutely aware that students are *at risk* of being 'cut off' from department funding because of the limited resources to go around. In fact, while she does not specifically identify the

motivation, it is possible that students in her department seek outside funding to compensate for the limited resources available within the department. If nothing else, Janet clearly identifies the tenuous and stressful nature of funding, which shifts depending on factors largely outside of students' control.

Funding Competition: Precursor for a Toxic Department Climate

The sentiment that funding competition is both pervasive and stressful, is not particularly novel. However, as students reflect on the whole of their graduate student experiences, it becomes clear that they perceive a number of consequences from funding competition on relationships with colleagues within their home departments. In fact, while some students are fixated on the availability and/or scarcity of department funds, others have more nuanced interpretations of the incidence and consequence of funding competition. For example, some students describe the structure of funding, and the resultant funding competition, as a catalyst for fractures within the student body. As Natasha (26), responds to a question about the social and academic climate in her department (Arts & Humanities):

> Frankly, if you're an [subdisciplinary specialist], you really just don't need as much money as people who are doing anything outside the US. I know the [other subdisciplinary specialists] complain about this a lot, because if I need to get a plane ticket to Kenya or to my colleague who's – one of his archives is in – is it Ghana or Cameroon? I don't remember. But anyway, the plane ticket there is the cost of someone else's entire research trip if they're roaming the country. And to not acknowledge that that is a huge disparity between the graduate students is just – I don't know, it's kind of annoying, particularly from the point of view of someone who is sort of constantly desperate for money to go places. Listening to the [subdisciplinary specialists] complaining about not getting enough funding – infuriating.

Here, Natasha details her frustration with the overall structure of funding in her department, including competition for and allocation of funding. With a visceral tone, she describes the fractioning between students with domestic and international substantive interests, because of a disconnect between funding needs and funding allocation. But while she is clearly annoyed with

students who unduly complain about the funding they receive, the most illuminating of her reflection is the momentary reference to the department as the primary source of this injustice. By calling attention to the department's lack of acknowledgment regarding the *disparity* between graduate students, she locates a core problem – the structure of department funding. Nevertheless, she falls prey to the deleterious consequences of funding competition, which become rooted in the social relationships within the graduate student body. She specifically targets the subfield specialists who undeservedly, in her opinion, complain about their funding. In other words, despite awareness of the department's role in funding decisions, Natasha holds individuals accountable for a structural problem.

Other students also identify fractures along subdisciplinary lines as the result of funding competition. As Paula (25), from a Social Science Department remarks:

> Our faculty are usually pretty good at hiring us [as RAs], other subfields not so much. And so there's kind of a lot of tension about – I think it's perceived that one subfield is getting unfairly advantaged, and that has kind of seeped through into social ties and so there's a lot of tension coming along those lines. In terms of people who think they're not really getting their fair share and people are getting an unfair share versus people who think they're getting what they deserve, and then people kind of step in the middle of like, well, I'm not getting it but I don't think it's unfair. And so there are probably those three that's on campus right now. So it's a little weird in the department right now.

Nick (31), from the same department, further details the divisions among students by subfield:

> So, yeah, the funding is generally very competitive in [Social Science Department] and becoming even more so. And especially since funding for conferences and funding for teaching seems to be skewed towards […] like, [subfield A] as opposed to [subfield B]. And so, the students that are in those other subfields certainly feel shafted and are voicing those concerns. And there are some debates.

While not everyone feels personally disadvantaged, including these interviewees, Paula and Nick describe fractures along subdisciplinary lines, because of disagreements regarding fair shares of the funding pool. Combined, they detail that funding competition of all kinds – for travel support, teaching and research assistantships – creates conflict among students by seeping into the social ties of the department. Even those who describe the absence of funding competition in their home

department attribute this to creating a supportive, social and academic climate. Hannah (28) describes the climate in her small, Social Science Department:

> I think we're distinct because we're a small program and we're also all funded, or at least historically we've been all funded. So we're able to cultivate a really collaborative, not competitive environment. […] So, it's really a kind of familial environment; really supportive of each other, really interested in pushing each other toward different theoretical frameworks and stuff. So, I think it's great. And I think that's pretty explicitly tied to the fact that we don't have to compete or fight for funding.

Hannah is unique in that she hinges the supportive climate in her department on two factors – size of the department and absence of funding competition. In fact, Hannah is the only student to couple the absence of funding competition, in any way, with a supportive climate. Still, the manner in which she draws a parallel between the social and academic environment of her department (i.e., relationships between colleagues) with the structure and allocation of funding, is consistent with other doctoral interviewees. In fact, she identifies the absence of funding competition as *explicitly* contributing to the cultivation of a supportive department climate.

While using the same logic, for the numerous students who experience funding competition, their interpretations are seemingly complex and multifaceted. To a great extent, they convene around two related issues – *fairness* and *clarity*. In this manner, students illuminate complex dimensions of funding that lie beneath their frustration with the structure and allocation of department funds and that have significant consequences on their relationships with colleagues.

Fairness and Clarity

A common sentiment among students regards fairness and clarity as central dimensions of funding competition, both as a source of personal frustration and in the social conflict arising within departments. For some students, such as Nadine (30) from the Arts & Humanities, fairness is framed in terms of scarce resources allocated to some students and not others:

> Since first years don't teach in my department, I had an unfunded first year. And most people have basically the same package, but the one thing that kind of does cause problems – maybe the one kind of inequity of the system is there are some first-year fellowships but not enough for everybody. And I think particularly when I came in, it was lean times.

Here, we see the perceived injustice lies in that there is "not enough for everybody". In other words, some students receive fellowships while others do not. However, Nadine illuminates a second concern – considering students have "basically the same package", she suggests there is some ambiguity or uncertainty regarding how and why some students receive these fellowships, while others do not. To her, this seems especially unfair because the fellowship she references comes at the time of admission (i.e., is based on admissions criteria), rather than after students have had a chance to prove themselves. Much like Natasha communicates in the previous section, Nadine interprets this as an "inequity of the system", referencing the structure of funding within the department. In contrast to Natasha, however, she conceptualizes this as an issue of scarcity, rather than oversight by the department.

For Nadine and others, *fairness* is intimately tied to *clarity* regarding funding allocation. For example, a number of students detail frustration understanding the eligibility and allocation criteria for funding in their respective departments. As Janet (28), remarks:

> But it's very competitive for those like very few fellowships. And I think it can…it kind of causes a lot of distrust in some ways because everybody is applying for the same fellowships and like some people are going to get them and some people aren't. And it's not really clear what criteria has been used, and so not only is there a competitiveness, there's a lot of lack of understanding about how – on what basis are these awards being given out. Why is this person being awarded it and not me? And just a lack of sort of clear criteria.

Janet's frustration is evident in two ways. At a basic level, she conveys that it is challenging for many students to compete for very few fellowships. Beyond this, she identifies a lack of clear criteria regarding how funding is allocated in the department. Both the scarcity of funding resources and the principles upon which these resources are allocated, contribute to the distrust that emerges. In fact, the emphasis in Janet's description of funding competition suggests that the fairness of

allocated funds has as much to do with who gets what (as a function of scarcity), as why (as a function of fairness).

As the above comments demonstrate, students complain about their struggle to compete and acquire funding while relying on unclear allocation criteria. However, discontent with the process by which funding decisions are made and communicated is not isolated to those without financial support. For example, Natasha, whose doctoral work requires her to travel abroad, expresses particular frustration with delays in communicating information about funding:

> I got an email from the department chair sort of saying, oh, you're invited to the (department name) department awards luncheon or whatever because you have been granted funding, specific details of your award are forthcoming. And I thought to myself, okay, thank you for letting me know I got something, but I would really like the specific details now because I want to know if this is enough money for me to even take my trip. And I didn't know anything for weeks. […] it's really frustrating how long it takes them to get back to us on certain stuff, even just to say no.

While Natasha *is* a recipient of department funding for which she applied, she remains frustrated with the manner in which decisions are communicated. In fact, her remarks suggest a potential distrust of the department. In other words, she perceives the department as withholding information, rather than, perhaps, finalizing funding values or working through administrative details. While the reasons for the delay in communicating clear and timely funding decisions are unknown, Natasha, and other students report perceiving these delays as a lack of transparency, and ultimately unfair.

The students above largely equate *fairness* with greater *clarity* regarding how and to whom funding is allocated. However, some recognize that these ideas are not, in fact, synonymous. Nick (31), describes the debates amongst colleagues in his department:

> So there's this call for transparency. But then even if there's transparency, that doesn't necessarily guarantee fairness. And then, do we want meritocracy? If so, then you're not going to get something that's necessarily fair, in terms of equal, like, everyone, just because you're a PhD student, gets the same. It's like, well, some people are all-stars so we're giving them this package […] There's all sorts of different packages.

He continues:

> Some of the people are like, well, this funding situation isn't fair. I was like, well, I guess, but then again it doesn't have to be. Because one person might do all their coursework on time, do their quals on time, propose; and it's like, you're over here saying, I should get the same level of funding, but you haven't done any of that stuff. Like you're in your sixth or seventh year and you finished your coursework, but you haven't finished your quals and haven't proposed and don't know what you're going to do for your dissertation. It's like, what is your claim to equal funding with that other person? And so, I guess it's an argument in favor of meritocracy, but I don't know.

Nick highlights two important assumptions that students in his department and interviewees in this project, share: 1) that *clarity* and *fairness* are the same, or that one leads to the other; and 2) that fairness (i.e., meritocracy) is the same as equal outcome. Overwhelmingly, students object to the ambiguity of criteria by which funding is allocated in their departments, because they equate unclear practices with unfair outcomes. This isn't necessarily the case – in fact, greater clarity may reveal a fair, merit-based system, upon which funding is distributed. Still, students' reflections reveal that this is only one part of the problem. The second, is that whether or not greater clarity reveals a "fair" system, such that it is in line with meritocracy, this may not actually be desirable. This latter point highlights an important contribution from social psychological justice scholars – the difference between distributive justice and procedural justice. While procedural justice pertains to agreed-upon, decision-making practices that shape allocations, distributive justice is concerned with equity and need – i.e., outcomes delivered on the basis of relevant inputs and needs-based assessments. While students complain about flaws in procedural justice – that is, unclear and/or discordant rules by which funding decisions are made – their genuine concern is with the perceived distributive injustice (Hegtvedt 2014). Many students agree that lack of clarity regarding funding criteria is stressful, and creates challenges in competing with others for department resources; but as Nick puts it, a call for transparency doesn't guarantee fairness, and if there is true fairness, then not everyone "gets the same." While an incredibly insightful interpretation, Nick is the only student of all the interviewees to communicate it.

In stepping back from the qualitative data, we see that students have very nuanced and complex means by which they process and make sense of funding competition. While many draw attention to the scarcity of funding, and some to the disconnect between funding needs and funding received, others focus on the fairness and clarity with which funding criteria and allocation decisions are communicated. All in all, students' experiences of funding competition characterize a largely contentious social and academic climate, which is consequential for their relationships with one another.

Status

Although to a lesser extent, students also describe a second dimension of competition – namely, the struggle for status and rank in their departments. While students' experiences of this competition are amorphous, they bear resemblance to funding competition in that they have meaningful consequence for the social climate between doctoral colleagues. As Paula (25), from a Social Science Department communicates:

> And so, I think what happened was a couple of years before I got there, we had a really big cohort, and I think that there was some competition there just for attention.

When prompted, she elaborates:

> Like, you interact most with the people that are ahead of you; and so if that's what they're doing, that just kind of seeps down. And so, I think now it's just kind of this culture of, oh, everybody is doing this, so I have to do it, too. And that has just kind of manifested itself. And what originally was probably some insecurity over attention from advisers, has now just kind of seeped down. And I think there's still some of that insecurity factor, too. And that's, I think, the nature of grad school.

Paula speculates that competition arises from insecurity over attention from advisers; and while she references the routine practice of upward comparison amongst students, it is unclear how, why, or with what success they do so. In fact, Paula doesn't sincerely question the process. Rather, she discounts it as being inherent to graduate studies. Her interpretation does reveal, however, that

this competition works its way into the culture of the department, manifesting itself in relationships between colleagues. This assessment of competition amongst students for status or rank is noted by other students as well. For example, Hannah (28), from the Social Sciences remarks:

> When I came in, my personal perspective was that the climate was competitive and exclusive and cliquey, and not very friendly. […] In particular, there was one person who also had the same adviser, and she in particular, she had a high role in the department. She's very active in the department and she was – I would say challenged by me. She was – I could sense fear, and that relationship really influenced my perspective on the department.

While Hannah's experience is influenced by an early impression from a colleague, she also reports that her department, writ large, is competitive, fragmented, and unfriendly. In agreement with Paula, she notes the importance of competition for advisers, as a catalyst for tension in the broader social and academic climate.

Others cite *productivity* and *academic progress* as central to status competition. As David (33), from the Social Sciences, reports:

> There can be a little bit of one-up manship sometimes. A bit of… you know… umm… 'oh you're still here' kind of – 'why aren't you a professor yet? – that kind of thing. And I don't quite know where some of that comes from. Especially the … I don't know if there's kind of uh – people don't want to see people who aren't moving through as quickly as they themselves want to be. You know there's some of that projected, you know, I need to meet other people who are successful so that I know I'm going to be successful – that vibe.

Here, David documents the competitiveness in his program which manifests in sly comments and criticisms between colleagues. Like Paula and Hannah, he suggests that these comments stem from insecurity, in this case, regarding personal progress through the program. And while few students overall address the issue of competition for status and rank, those who do demonstrate that, even when individual insecurity and fear are at the root of status competition, all students endure harmful social and academic consequences as a result. As Paula summarizes:

> One thing our department doesn't really have a good culture of is sharing when people feel like things are going poorly. So, we have a lot of people where it's like, 'oh, I worked so hard today, and I did this and this and this'. And that's really hard when you're having a bad day or you're struggling, you know, you have a roadblock, and somebody is like, 'oh, I wrote 10 pages today'. And you know they probably didn't write 10 good pages, but to just hear that;

> 'oh my gosh, I'm so behind'. That's also a time I think it feels isolating. Even though abstractly everybody is going through the same thing as you are, it's hard to feel that way when nobody is talking about it.

Paula's description further illuminates the sentiment that students keep up appearances to mask their own insecurities. In doing so, and perhaps without knowing it, they isolate colleagues and contribute to a tense and unsupportive department culture. Her comments at the end are especially noteworthy – "even though abstractly, everybody is going through the same thing as you are, it's hard to feel that way when nobody is talking about it." Here, Paula acknowledges what many interviewees communicate. That is, some challenges in graduate school are seemingly universal – struggles to make academic progress, experiencing insecurity, seeking validation/approval from advisers, etc.; however, experiencing these alone is especially burdensome and difficult.

In all the interviews, the remarkable exception is that of Audrey (24) from the Social Sciences, who describes her department as markedly absent of status competition, despite the seemingly cutthroat nature of the program:

> Normally in a program, who [*sic*] ends up having to cut people, you don't really share your work because you need to make sure that you're the best or you're at least not the worst. And here, we kind of all know that someone has to get cut, and it might be me or whatever, but that doesn't stop almost anybody from sharing answers. They're like, 'you need help? Let me take a picture of all of my work and send it to you. And if you have questions, call me.' 'Oh, you didn't get the coding done for our problem? Let me email it to you.' 'Oh, you didn't understand, let's meet in the library and walk over it together.' And if there wasn't this sort of anti-competitive sentiment, I probably wouldn't have been so, and others probably wouldn't have been so honest about the emotional trials of the program.

Audrey recognizes the importance of anti-competitive sentiment in her department to the emotional openness between colleagues. Like Hannah's comments earlier, she cites collegiality as one of the primary characteristics of the department climate, attributed in part to the absence of status competition. In fact, the generosity witnessed amongst students, and their willingness to commiserate with one another about the emotional toll of the program, is directly linked to *anti-competitive sentiment*.

While less prevalent than students' recollections of funding, status competition was a central theme in the interviews. Both, notably, demonstrated meaningful consequences for students' social and academic lives. In their interpretations, tense and unsupportive department climates were instigated by students' fears, insecurities, and experiences of isolation. The specific concerns students express about insecurity are related to broader concerns about transparency in expectations.

Transparency

While many students reflect upon issues of transparency related to funding competition (discussed above), some also identify broader concerns regarding the communication of department norms – these issues of transparency are discussed here. The GSSC has two, relatively crude measures of department climate – interaction between graduate students and interaction between graduate students and faculty. Both binary measures, these capture whether graduate departments sponsor events allowing for informal conversation and interaction between the relevant parties. Chapter 3 concludes that greater interaction amongst graduate students, and between graduate students and faculty, is associated with lower psychological distress. Nevertheless, these variables cannot capture graduate students' stress experiences regarding other elements of department climate, including cultural norms, social patterns, hierarchies and the like. In the qualitative interviews, while students highlight diverse and multifaceted elements of department climate, one prevalent theme arises – *transparency*. Below, I detail issues with transparency that students express regarding department norms and navigating mentorship/advising relationships.

Transparency: Department Norms

Reflections on department climate come from seven questions in the qualitative interviews. The first two ask students to reflect upon the social climate in their departments, including relationships between faculty and students and relationships among students, respectively. Questions three

through five ask students to comment on levels of support from faculty members, in the form of collaborative partnerships, assistance with degree milestones (e.g., qualifying exams, job market applications), and other general resources. Lastly, questions six and seven ask students to describe how the overall climate and resources in their department influence personal progress and success in the program.

In answering these questions, students reveal the desire for greater clarity and openness regarding professional norms of behavior, academic procedures, and overall conduct within the department. For example, Lisa (32), from the Arts & Humanities, details the optional, yet implied expectation of student attendance at professional events (e.g., workshops, colloquia, etc.):

> And so we usually get an email from, usually the – even if it's not the department chair, it's the director of graduate studies stressing our attendance. And why that is not worded as a mandatory thing, in those terms, is beyond me. It's understood though, very understood by all the graduate students. I know it's not in the wording. But we're also told by other faculty, who are like, 'okay, we'll see you at this, we'll see you at this', you know 'this, this, that'.

Lisa's frustration is not directly tied to the expectation of attendance by the department administration. Rather, she struggles with the discrepancy between the expectation of mandatory attendance, for an optional event. In fact, her description illuminates a hidden pressure from the faculty to adhere to professional norms, without being explicitly told to do so. In this manner, it seems Lisa, a mid-career doctoral student, underscores an element of the hidden curriculum in doctoral training.

Other students point to a disconnect between the manifest and latent content of official rules and norms of behavior. In describing her departments' procedures for the qualifying exam, Audrey (24), from the Social Sciences comments:

> Honestly, I don't know whether they're – it's so unclear what the purpose is, because I originally thought you just have to prove that you're at a certain level, and if you prove that you're at a certain level, you pass automatically. But I've also heard that the people who ended up doing [sub-specialty], they were the ones who – they hinted in their first year like, I'm interested in [sub-specialty]. And this isn't for sure but it seems people who were interested in [sub-specialty] all failed the first time and were brought together the second

> time. So, the [sub-specialty] group could be tested to see who is the best and in what areas. But I don't know, maybe that's not the purpose of the core exam.

Later, she continues:

> I think they said, we'll let 40% or 60% through the first time. I think it might even be written somewhere, like hidden under piles of other words. Because I didn't even know – when I came in. I knew there were core exams, but I didn't know that people got cut consistently. Like, every year, they have to cut somebody, if not more. We're lucky because we're only 12, so they can't cut probably more than two of us and still be able to support all the undergraduate and grading assistants that they'll need in the later years. The class above us was not lucky; they came in with 22, and they're now 16. […] They tell us the purpose of the cores is not to cut people, not to fail people. But I think it's a very good way of, if you don't have enough money to, or if you just don't see promise. I'm not really sure why they do the cores, but they do. And it's very stressful.

Here, Audrey struggles to reconcile the *manifest* and *latent* functions of the qualifying exam. On the one hand, she notes her initial impression of the exam's purpose – to test comprehension and expertise in a substantive area. Later, she questions the true purpose of the exam, ranging from separating the best and brightest students from everyone else, to cutting cohort sizes, to saving money. All in all, she questions the motives behind the practice, and has seemingly unreliable information upon which to base her opinions. In addition to which, her reflection on the process highlights distrust and discontent with the department, causing distress. The tone and language Audrey uses to describe the process is especially noteworthy. While acknowledging that official department policy may clarify the process and purpose of the qualifying exam, she claims that this information is "hidden under piles of other words". This statement so poignantly addresses the challenge with transparency – information about department norms and procedures is not readily, accurately and reliably available.

As a whole, students' reflections on transparency in department norms seem to center around feelings of control. In almost all instances, students communicate a loss of control by virtue of not having access to valid and reliable information about department expectations. Arguably, this challenge is magnified in large departments where rumors "fill the gaps" between official policy and

department norms. Worse still, these rumors create tensions in the social and academic climate of departments, similar to the toxic environment that funding competition stimulates. As Natasha describes:

> I feel like there's this sort of split in the department, actually, between people with a certain idea about [the department] and graduate students and a whole lot of things, and other people who feel differently like; What is the role of teaching? What is the role of research?, various stuff like that. But, again, this is stuff that I also hear, like it's this and that, whisper dangling kind of stuff, which I think is more stressful than if I just knew because you end up imagining lots of stuff about like, well, what even is the problem here?

In this case, issues with transparency surrounding department norms and overall climate become rooted in social factions. At the foundation of the problem, seems to be a general lack of communication between students and faculty, causing disagreements that range from the scope of the academic field to interdepartmental relations. As Natasha acknowledges, students become stressed out by being unable to discern truth from rumor, exacerbating the problem.

It is worthwhile to note that students in all stages of their doctoral training, and across divisions, report issues with transparency regarding department norms. As such, this phenomenon seems a pervasive and institutionalized problem. Audrey summarizes feeling blindsided by misinformation when she first applied to her program:

> It probably could be the lack of transparency when you're applying to the program. If I knew there were – this was such a crucial thing for me to know – I knew there were core exams, but I didn't know people had to get cut. I was just so disappointed by that; that they didn't tell me. […] Or like, I had other people who asked about the workload and they're like, yeah, we'll have – weekly homeworks will be rare. That's what they said. Pssh, lies! Unless you're just completely out of touch with what the professors are doing to people in their first year. Or just like, please be more honest with the intensity, with whether or not you move on with the core exams, with the environment. Like, the teachers aren't going to hold your hand through this, please tell me.

In this case, Audrey describes the absence of information as related to ill-preparedness for a central feature of her doctoral programs – academic success. As such, she reveals the broad

sweeping academic consequences of poorly communicated department norms, accompanying the social consequences discussed earlier.

In all, the number of students communicating issues with transparency in department norms were few (n=7). Still, these reflections demonstrate that standards of professional conduct and norms of the doctoral program could be more clearly communicated. While stressful for individual students, these instances also seep into the broader social and academic environment of graduate departments, jeopardizing interpersonal relationships and doctoral program success. As an issue of transparency, many students highlight broader concerns with discerning manifest and latent functions of program procedures (e.g., the qualifying exam), and unclear professionalization norms (e.g., in discerning whether colloquia attendance is mandatory). In most instances, students imply a lack of control in lieu of readily available, accurate and reliable information about their department and doctoral program. In occasional but consequential instances, students rely on department gossip to *fill the gaps* in circulating information. Ultimately, a lack of transparency causes students to feel less sure about navigating the doctoral program, and leads to tensions in the social and academic climate.

I take the emergence of these themes as evidence that, while some higher education literature has correctly identified the importance of unwritten norms and values to the graduate student experience, there are unexplored dimensions of department climate that are deserving of greater attention – namely transparency. Students express a range of emotional, academic and social consequences related to lack of clarity in their departments and to misunderstanding the manifest and latent functions of department policies and practices. By doing so, they indicate a complex and nuanced facet of their graduate experience, imbued in the department climate.

Graduate Student Stressors/Resources

Prior research documents pervasive exposure to stressors/resources amongst graduate student populations – including exposure to time constraints, role conflict, role overload, isolation, and access to funding and mentorship/advising relationships (Goplerud 1980, Grady 2014, Walfish 2001). While many of these are echoed by doctoral interviewees in this study, one additional theme arose beyond that which was expected – *playing defense*. I use the term playing defense to denote students' confrontations with colleagues and faculty within their division (internal) and family/friends outside academia (external). In these confrontations, students feel pressured to defend themselves against substantive and utilitarian criticisms about their research, including, but not limited to, its contribution to their field, its consistency with mainstream research in their field, and its overall practicality. In the section that follows, I will briefly outline two graduate student stressors/resources that have been discussed in previous research and that were most common amongst interviewees – namely imposter syndrome and mentorship/advising relationships – followed by an elaboration of students' experiences of *playing defense*.

Imposter Syndrome

Imposter syndrome refers to the difficulty students have internalizing their accomplishments, accompanied by the unsubstantiated fear of being exposed as a fraud or phony. While not directly addressed by the quantitative analysis for this project, imposter syndrome was routinely mentioned in response to the following question from the qualitative interviews : "If you think about the department climate as a whole; both the social and academic side of things including the faculty, students and resources you've mentioned, would you say that the department climate has influenced the stress you feel while pursuing your degree? Why or why not?" Several students described conscious experiences of imposter syndrome, naming it directly; whereas others described a general difficulty with academic self-esteem, and challenges living up to unspoken and, at times, unrealistic

expectations. In the latter case, students doubted their own abilities relative to *myths* of what a successful graduate student should look like.

At a basic level, many students reported struggling with esteem in their academic work. As Chloe (40), from the Natural & Mathematical Sciences reports:

> I went to community college, transferred to a state university, and during all of this, figured out that there's this thing called science, and you can become a scientist. And you can get a degree in graduate school. I didn't even know what that was. So, I feel like I've been behind the entire time. […] And I think my self-esteem has taken, you know – it's been rough. The last couple of years, I had some highs and some lows.

While Chloe first attributes low self-esteem to her academic background, she later comes to define these feelings of doubt as similar to colleagues' experiences of imposter syndrome. She continues:

> And it's funny because the more that you go through this, you realize that other people are feeling the same thing. […] Like, we go through prelims imposter syndrome – and God, how many times that I – and I still wait for somebody to go like alright we made a mistake. You're not good for this, you're not made for this. We're going to tap you on the back, give you a Master's degree. And like, I don't know, go figure out life somewhere else.

While Chloe questions her own competence and ability, feeling as though her department will "find out" she's unfit for the doctoral program, she communicates an awareness that others experience similar doubts. In fact, she, and other students alike, detail imposter syndrome as an ongoing stressor – that is, an experience of *waiting* for others to uncover their secret.

For some, experiences of imposter syndrome are manifest in disaccord with their academic achievements. As Audrey explains:

> I was severely doubting my abilities and skills; and, almost, there was [sic] some weeks where I was like, I'm going to email [adviser] and ask for a meeting to ask why I got the fellowship. Like, why did you believe in me? I need that, please tell me because I don't believe in myself, sort of thing.

In this poignant reflection, Audrey expresses not only her self-doubt but her genuine disbelief in deserving academic accolades. Julie (49), from the Social Sciences, reports a similar experience of reconciling the praise/assessments of others with her perception of self:

> Although when I look back at the first few semesters I still – when I thought I was doing horribly, there were students who really saw that, they were consistently talking about my enthusiasm, even though I was scared going in and stuff like that. And I had one student, the semester after […] like a year and a half later, I saw a student from that semester. I knew I taught him and I said 'which course did you take from me', he said '[course name], spring 2012' – 'Oh my God, I'm sorry' I said, 'I remember that as my worst semester', and he said 'I have no idea what you're talking about. That course made me decide to be a major in [department]'. I said 'wow!'

It would be easy to dismiss Audrey and Julie's perceptions as merely misaligned with fellow colleagues and students. However, students' experiences of imposter syndrome reveal more than simply low self-esteem. For example, many students mention questioning their accomplishments and/or competency in relation to the obscure "successful graduate student". In this comparative framework, students negotiate an image of what a motivated, productive, and ultimately thriving graduate students should look like. As Lisa suggests:

> So, I still struggle with communicating with my chair, because I still have a very – it's like this weird projection of 'I don't want to disappoint her.' When I miss a deadline or I'm struggling or I want – there's still this image of, what a successful graduate student does is – like, can produce. And I am suffering from a lot of motivational kinds of things […]

Later, she continues:

> There's always the imposter syndrome. And I think that there's a piece of that that's cultivated because depending on who you're talking to, there's only a few things you can kind of complain about. I mean you can talk about teaching; you can talk about how hard it is writing a dissertation. It's almost like if someone says something positive, like if they're enjoying their dissertation or they're enjoying their research, we feel – and I'm being incredibly general right now – that it's almost as though that's interpreted as this offensive thing. Like, how dare you not be groveling and struggling and not sleeping? Like, what?

In Lisa's experience, we see she both confronts and negotiates the *myth* of the successful graduate student – the student who doesn't disappoint his/her chair, meets deadlines, doesn't struggle, is productive and motivated. In the second passage, however, Lisa hints at a source of this stressor – the department itself. In citing the culture of the department, and specifically the interpersonal relationships between doctoral students, Lisa describes imposter syndrome as *cultivated*. In fact, this cultivated insecurity is the default or normative experience for students pursuing a

graduate degree – experiences to the contrary are met with skepticism and disbelief. In reflecting further, she comes to summarize her experiences as influenced by, but perhaps not entirely caused by the department climate:

> Imposter syndrome? We're talking about sincere mental and emotional aerobics that I didn't feel equipped for. I'm around; I still don't feel like, 'woo, I'm an expert.' […] And I think that it is – the fact that you're looking at the population that you're looking at is great and also necessary because I think that there's a disconnect between – not pinning it on our department, but there is a connection between our department and our environment and these things. They're not the sole source or the impetus, but they play a role.

While few others explicitly mention their department as playing a role in the generation of imposter syndrome, the routine and deleterious practice of holding one's self to unattainable standards is mirrored by numerous graduate students. In this interpretation, imposter syndrome is both an individual experience – e.g., grounded in perceptions of productivity – as well as a social experience – grounded in students' relative standing. While consistent with literature suggesting relative deprivation/assessment has profound impact on individual experiences of psychological distress, it is noteworthy to see that doctoral students compare themselves to idealized others (Mishra 2015).

For doctoral students in this study, the manifestation and interpretation of their imposter syndrome is both related to and influenced by the department climate to which they belong. For example, in instances where students had a supportive and collegial department, sharing their feelings of self-doubt led to greater connection with colleagues. As Nadine describes:

> We all kind of feel, I think, sort of the doubt and negative feelings, feelings of inadequacy or imposter syndrome. We all feel that stuff. But I think it's – we definitely, I think, are – a lot of the conversations that I have with colleagues, I feel like there's not a lot of sort of trying to keep that hidden or kind of keep up a strong front. I think that with my friends in the department, there's a lot of vulnerability, which is helpful.

In contrast, where students described their department climate as less supportive, their feelings of insecurity were exacerbated by colleagues reading this as a sign of weakness. In her own words, Lisa explains:

> And I think, too, when I bring up the whole imposter thing, that we only go so far to talk about that. I don't see my peers often as a safe space to go, 'I'm really struggling and I'm worried about this and I just can't figure out … I'm just barred down' So there's a limit to the common suffering with graduate students.

In all, while the prevalence of imposter syndrome amongst doctoral students is common, the connection between department climate and the experience/interpretation of imposter syndrome is novel. Beyond low self-esteem, students routinely compare themselves to idealized others, at times, bringing about the imposter syndrome itself. In this manner, imposter syndrome comes to characterize a pervasive, normalized and largely deleterious experience, ingrained in graduate school.

Mentorship/Advising

Three questions, alongside numerous probes inquire students about their experiences with advisers: 1) Would you say you *have* a faculty adviser, and if so, what does that relationship look like? 2) Would you say you and your faculty adviser are a good fit? and 3) Do you ever find the relationship with your adviser stressful? How so? As a follow-up, three identical questions are asked of students regarding their relationship with faculty mentors.[38] A substantial number of students were encouraging in their assessments of relationships with faculty including, but not limited to, receiving multifaceted faculty support (i.e., informational, socio-emotional, etc.), developing close relationships with faculty, and receiving pseudo-mentorship/advising from advanced graduate students. However, numerous themes from the interviews also communicated students' challenges with initiating, navigating and maintaining relationships with faculty advisers/mentors.

At a basic level, students communicated difficulty initiating relationships with faculty in the absence of opportunities to do so. As Janet describes:

[38] While mentorship and advising are unique in the conceptual framework of this study – advisers provide informational support (to help students make efficient progress through the program), mentors provide socio-emotional support (in the form of encouragement, sympathy and coping assistance, etc.) students routinely interchange these terms in line with the cultural norms of their departments.

> But I think that relationship, that mentorship relationship that's assigned to you when you first come in, is pretty much the only kind of relationship of that sort that you have [at the start]. And then you are expected to put together a committee for your qualifying exam […] and then the same thing is true for your dissertation. So yea, it's pretty much up to the student, which I think is… I mean it's good to have autonomy in the sense of like, you know, you can pick anybody that you want, but when you've…you know, you might not have even taken classes with everybody. There's not like any informal or formal way of getting to know other professors in a really meaningful way, it's kind of just like maybe you talked to them at colloquia, or maybe you sat in on one of their classes. But outside of taking classes with them you're really not going to get to know the professors.

Here, we see the frustration lies not necessarily in the initiation of student-faculty relationships, but in the vetting process. In the absence of "meaningful" opportunities to meet and communicate with a variety of faculty, students are often confronted with choosing advisers/mentors in absence of pertinent information.

In part, Janet's concern lies with the absence of structured ways to meet faculty. However, this concern remains even when students are assigned a faculty mentor, upon admission. Later in her response, Janet highlights a distinct but related issue regarding the onset and maintenance of relationships with faculty advisers – i.e., the stakes:

> But everybody in our department, faculty-wise, has a very different sort of picture of what it looks like to be successful and what it looks like to be meeting your obligations as a graduate student. Some people say you should be trying to publish, other people say no, you should just be working on your dissertation. So, there is a lot of disagreement about how best to sort of put yourself out there.

In this quote, we see that students' stress in initiating relationships with faculty does not simply pertain to lack of information with which to make these decisions, but also, the potential risk for making poor decisions. In other words, students choose an adviser/mentor with little prior experience upon which to base their decision, and are also confronted with the high stakes that faculty vary widely regarding their mentorship/advising philosophies. As Janet provides an example, while some faculty prioritize publications, others do not.

Arguably, however, the more consequential variance across faculty is in their divergent ideas regarding *graduate student success*. Many doctoral interviewees echo their difficulty navigating this

aspect of mentorship/advising relationships. In this manner, students communicate a concern with optimizing mentorship/advising *fit* – i.e., in maximizing congruence between their expectations and experiences of mentor/advising relationships with faculty (Walfish and Hess 2001, Waters 2004).[39] For example, in referencing his relationship with an adviser, Brayden (30) from the Natural & Mathematical Sciences recalls:

> There is some degree of transparency but – […] but I just think we don't necessarily understand each other and I think in order to foster a strong relationship, that takes spending time and things like that and there just hasn't been enough of that and I think initially I was trying to be the person to go and do all of the reaching out and stuff like that, but at some point I feel like, you know, as an adviser [trails off] – meet me half way or have a more hands-on approach. And it's not necessarily the case. The hands-on approach isn't necessarily there.

While Brayden uses the term transparency to describe these issues, his concerns are more in line with the idea of *fit,* as outlined above. Fit may be compromised by several factors, including uncommunicated expectations at the outset, unrealistic expectations on the part of the student and/or faculty member, difficulty negotiating the power dynamic of student-faculty relationships, and the like. In optimal situations, students and faculty share explicitly outlined goals and work toward them, resulting in a favourable assessment of the relationship (Waters 2004). For Brayden, while it is clear he expects his adviser to be "hands-on" and "reach out" to foster a strong relationship, it is unclear the extent to which this was communicated and/or agreed upon. Nevertheless, the perceived discrepancy manifests in a disconnect between Brayden's understanding of an adviser's role, and the role his adviser currently fulfills. In this manner, greater clarity regarding expectations of student-faculty relationships would likely eliminate his discontent and stress.

Describing similar experiences, some students communicate difficulty navigating and maintaining multiple mentorship/advising relationships, within complex department politics. As

[39] As per the research literature, fit is related to the perceived satisfaction of one's mentorship/advising relationship. This concept is not captured in the GSSC, and is therefore the information relayed here builds on the quantitative analysis in Chapter 3.

they note, this is especially crucial when assembling advising committees. While some rely on insider knowledge from colleagues, accurate and timely information can be difficult to parse from department gossip. As Natasha details:

> Because this is the kind of thing where not even everyone in my department knows that this has happened [a conflict between two faculty members]. I feel like it's the kind of thing they generally try and not talk about. Interdepartmental [sic] gossip in our department is actually at this very frustrating level, where certain little things leak out and, typically, where you kind of want to know more. But the professors tend to really not want you to know this stuff, so we just hear this frustrating level of stories of personality conflicts between professors.

Natasha later details that the unsubstantiated rumours about faculty make it challenging, albeit imperative, to choose advisers wisely:

> And I've heard that there is a sizeable contingent [of faculty] in the department who do not get along with my adviser. So, I've had to be very careful when selecting my committee, to not accidentally pick someone with whom there's going to be – I just don't want my committee to become a pissing contest between two people who don't actually care about my project.

Natasha's department was experiencing major funding and faculty changes at the time of the interview and her specific experiences are rare. However, her frustration is no less understandable. On the one hand, she desires advising support from her committee members. On the other, she questions the information she relies on to choose these members accordingly. With unsubstantiated department gossip as the primary source, Natasha hints that greater clarity and communication about faculty members, and their relationships to one another, would ease the decision making. Although it is unclear how and from whom this information should come, the crux of the problem remains the same – the absence of readily available, accurate and reliable information. Therefore, beyond the stress of navigating dyadic relationships between students and their mentors/advisers, often in the absence of pertinent and reliable information, complex department politics must also be considered.

Student-faculty relationships remain a challenge for many to initiate, navigate and maintain. As a consistent theme, students highlighted structural problems with the culture and/or organization

of mentorship/advising within their departments – such as inadequate opportunities for students and faculty to meet and converse. However, a number of cultural and idiosyncratic problems also arose amongst students – such as unfamiliarity and ignorance regarding how to choose an adviser/mentor, how to identify and express mentorship/advising expectations, etc. Ultimately, students' own relationships with faculty suffered. What this highlights, however, is that the solution to creating more successful, functioning, or at least less stressful relationships between students and faculty, may lie in developing a streamlined, informative, formal process by which students and faculty interact. At the very least, students have identified challenges in numerous areas of their relationships with faculty that lend themselves to a greater understanding of their stress experiences.

Playing Defense

Beyond the stressors anticipated at the outset of this project – i.e., time constraints, role conflict, role strain, isolation, funding uncertainty, and mentorship/advising quality – one additional stressor arose from the doctoral interviews – *playing defense*. By playing defense, students expressed the need to justify and validate their work in response to criticisms from colleagues and faculty within their field (internal) and pressure from family and friends outside academia (external). Students shared these sentiments at two separate points during the interview. Early in the interview, some students described playing defense as part of their experience navigating the social and academic climate of their department (in response to questions 1, 2, 6 and 7 on the survey instrument). However, at the end of the interview, when asked to compare the experiences of students across divisions, some described playing defense as a more general practice in the Social Sciences and Arts & Humanities. In this manner, students suggested that playing defense was one conceivable factor influencing the higher distress of students in the Social Sciences relative to their Natural & Mathematical Science counterparts (in response to question 13 on the survey instrument). Overall, only one student from

the Natural & Mathematical Sciences described the experience of playing defense. In the section that follows, I detail students' stress experiences while playing defense throughout their doctoral careers – confronting both internal and external pressures.

Playing Defense: Disciplinary Pressures

At a basic level, all students who describe playing defense express burden from the challenges of completing their doctoral program, while confronted with criticisms about the value and utility of their work. Most notably, students highlight these criticisms as a threat to their divisional *identity*, which, at times, rests on questionable footing. However, it is illuminating to find that some students must defend their substantive work and research trajectory to colleagues and faculty within their own departments. As Janet (28), from the Arts & Humanities remarks:

> I found it extremely stressful. One thing that I realize is that I wasn't ever going to be able to talk about my work with other graduate students because they didn't ever really see it as being interesting or worth talking about, or like [consistent with research in the division]. And that's a really like common way of dismissing people's work, is by just saying, oh, that's not ["real" research in the division], or like making you answer the question: why is this [real research in the discipline]? Before you even can sort of like start thinking about the actual kind of questions that you are trying to talk about.

Janet's stress and exhaustion with playing defense is palpable. While the intentions of those offering criticism are unclear, Janet understands these remarks as a "common way of dismissing people's work". That is, in her interpretation, these comments are unsolicited, trivializing, and ultimately serve the interests of the commentator. It is also clear that in defending her own work, Janet is distracted from more pressing concerns of the doctoral program,including creating and thinking about new research contributions in the field. However, it is noteworthy that Janet's defensiveness about her work and its adherence to the mainstream norms in her field, are couched in insecurity. This was a common sentiment amongst students who described *playing defense*. And while this

example may be a product of the social and academic climate of Janet's department, other students share similar experiences. As Hannah (28), from the Social Sciences remarks:

> So [my division] has this big kind of ongoing identity crisis, too, where it's like, well, what *is* [our division]? How is it not [the same as other divisions]? How do we make people understand what we're doing so when we say I'm a [researcher in the division] they're not just like, oh my gosh, I can [do that too you know]? How do we define ourselves and stake our claim as a field? And so, I think that plays into the stress, too. It's like, how do you validate what you're doing to other people.

At first glance, it appears Hannah explicitly references an external source of pressure. However, she continues:

> Like, how do you convince yourself that you're doing something when so many people don't understand what you're doing or why you're doing it? So, I think that's the biggest thing. And I think that then feeds back into like, well, I have to be working all the time; I have to be thinking about this all the time. Like, how is what I'm doing pushing the field forward, how is it having "good impact" on whatever community I'm working with. How do I convince people like NSF, who like quantitative projects or like things that have a clear, tangible outcome, that [my division] is something they should also be giving a lot of money to? So, I think that it's that constant like, oh, I have to be proving myself, I have to be doing it for the field, too. I think that's one of the biggest things.

Here, Hannah highlights an "identity crisis" as the crux of the problem. While Janet's frustration is manifest in relationships with fellow colleagues, Hannah seems captivated by philosophical questions about what it means to craft and solidify a divisional identity. In fact, it isn't entirely clear whether she experiences the stress from any immediate or centralized source, but rather that working within the Social Sciences, as a whole, necessitates a readiness to validate one's work.

It is also noteworthy that Hannah is seemingly insecure about her work, and perhaps the work of the broader field, when she remarks on the importance of external validation. In other words, she suggests that having "others" understand your work is central to estimating the value of the work itself. As she questions: "How do you convince yourself that you're doing something when so many people don't understand what you're doing or why you're doing it?" In a manner of speaking, Hannah illuminates that crafting and defending a divisional identity is valuable in and of

itself, but more specifically, valuable because it is linked to both perceived and tangible academic merit and support – such as pushing the field forward and acquiring funding, respectively.

It is clear from these quotes that Hannah experiences pressure from within the department/division (e.g., from academic peers) and external communities/organizations (e.g., from funding agencies), which was common amongst other students as well. In David's own words:

> There is no rubric to tell if you are doing a good job. There isn't any sort of metric of – I hate to use the word objective – but standardized. […] Like when you do math problems, you know when you got it right and when you got it wrong. […] Or your experiment works or it doesn't work. And you produce something or you don't produce something. And I feel like in the Humanities in particular, there is less sense of knowing how to judge your own against other things. And then I'd say also out of that, comes the idea that the Humanities, in particular, are devalued. […] Like for me there is always that little voice at the back of my head. That says what you are doing isn't real. It's not real science; it's not a value to anybody.

What David (33) and Hannah share is the sentiment that playing defense is as much about crafting identity as it is struggling to locate identity. While David doesn't explicitly mention having to defend his work to others, he details a common experience amongst the students quoted here, which is in questioning and negotiating the *value* of the work they conduct. Value is difficult to quantify, David notes, but this challenge is inherent to work in the Arts & Humanities, and arguably Social Sciences, writ large. Without explicitly mentioning it, it seems students in the Social Sciences and Arts & Humanities attempt to evaluate their work and academic contribution using a "hard science" metric.

Playing Defense: The Non-Academic World

Playing defense in the face of external pressures, students describe a need to endorse the utility and marketability of their doctoral work and degree. Doreen (23), from the Social Sciences, identifies a marked difference in both the nature of the work she conducts (relative to people like her brother in the field of Computer Science) and in perceptions of the utility of her work. She describes:

> This stuff follows you; publish it and it's all great and everything and celebratory, and then you realize 20 years later, oh man, I was wrong. Well, now your name is stuck to this inaccurate finding, whatever it is that you said. Or people will now make fun of you forever

> because when you did your logistic regression, you forgot to do whatever, whatever or you didn't control for this variable, or you didn't think about this. Or this whole time, this was confounding, all of your data. Or people even could pick something up. They could pick up this study and just be like, well, why does this matter? But with my brother, nobody is ever going to pick up a code and be like, why does this matter?

Later, she continues:

> After all of that, even if all that's fine, you have to think, okay, where do I go from here? Because it's publish or perish. Whereas with my brother, it's just, keep writing more code. Go take this job; get $70,000 right off the bat from college, and then just do whatever. And meanwhile I'm over here exhausted over racial disparities and [topic A]. And then if I try to go tell my parents about it, they're just like, "So, why is that important? So, what is this? So, I don't get it." If my brother says, I stayed up all night making a code for this whatever, like for an app that does this, everybody is like, "Oh, bravo. That's so cool. I'm sure everybody will use that. I'll use it, I'll download it. What's the name?" And I'm just over here like, yeah.

Doreen describes the challenge of justifying and validating her work considering the utilitarian criteria her family employs. This is a common feeling amongst doctoral students who find themselves *playing defense*. In this case, however, Doreen seems less insecure about her own work (relative to the previous students), and more frustrated with the criteria upon which it is being evaluated. She expresses particular frustration with being compared to her brother, in Computer Science, on the basis of the perceived utility and marketability of the work she conducts.

Kim (27), from the Arts & Humanities echoes a similar sentiment:

> And so that's also very frustrating, feeling this constant questioning of the rigor, not only just being in [the Arts & Humanities], where people seem to think that like, oh, I have a [socio-demographic trait/background], so I understand [this research]; which makes me want to always be like – now I just find myself saying, ok, I'd be happy to send you my qualifying exam questions; here are the 100 books you need to have read to answer them, enjoy. And you let me know if you feel as qualified about [the Arts & Humanities], which is just – that's not new; that's not unique to these kind of divisions. But also, I've heard people outright say, oh, the reason the hard science will get paid more is because they do more work. And it's like, okay, I had someone running all my labs for me and everything. Do you do more work? I'm not sure.

She continues:

> Having to constantly be defensive about what you're doing, defend that it's hard, defend that it's real, probably adds a layer of stress that if I were getting a PhD in Physics, no one would question if that was difficult or worthy of being paid money or anything like that.

Kim's commentary highlights a criticism connected to the issues of utility and marketability addressed above. In this case, she negotiates pressure regarding questions of rigor and work ethic. Kim plays defense to substantiate her work and the broader division as sufficiently challenging and worthy of pursuit. While the source of these frustrations is not entirely clear, her argument draws attention to the double-standard with which students in the Social Sciences and Arts & Humanities are expected to defend what they study (including its utility, marketability and rigor), whereas those in the Natural & Mathematical Sciences are not.

While similar in sentiment to the interviewees above, it is worth highlighting the one example of *playing defense* from a student in the Natural & Mathematical Sciences. Here, Chloe remarks:

> I just came back from home and it really annoyed me that my brother kept saying like, you know, something, something school. And I'm like I'm not going to school, I'm not an undergrad. I'm not writing papers. I'm working. And it's hard. Like my mom will be like she's in school. I'm like I'm not at school, I'm working. So that's kind of hard to not be able to explain to the rest of the world what we do.

Chloe vehemently rejects the notion that doctoral work is synonymous with "school." In fact, her refusal to accept this label suggests a clear demarcation of the status and rigor associated with "work", relative to being in school. Nevertheless, Chloe's remarks reveal that, much like the students prior, *playing defense* is about identity. Crafting and solidifying one's identity in a division compels one to defend the identity as well. Doing so, however, has consequences for students' stress experiences.

Whether making a case to funding organizations like the NSF, or developing metrics to gauge progress, students seem fixated on utilizing "objective" criteria, consistent with the hard sciences, to evaluate their own work. The stress of doing so, seems to coincide with the struggle to craft and demarcate a divisional identity. When questioned, however, students frequently *play defense* to validate and justify the merit, rigor, utility and marketability of their doctoral work and degree. While arguably all students navigate the norms of their home division, identifying a research niche within which to situate their doctoral work, this process seems markedly more common amongst

students in the Social Sciences and Arts & Humanities. In fact, in responding to the question of what explains the greater distress of students in the Social Sciences from their Natural & Mathematical Science counterparts (as observed in the quantitative analysis of Chapter 3), students were resounding in their agreement regarding the greater propensity of *playing defense* in the Social Sciences. My hypotheses about the Social Sciences and Arts & Humanities – i.e., their similarities in research foci, scientific traditions, department cultures and the like – are consistent with the doctoral interviewees in this study, who describe experiences of playing defense. However, the number of interviews conducted cannot substantiate this pattern amongst the broader graduate population. Nevertheless, the underlying premise for all students who *play defense* seems to be a questioning and negotiation of divisional identity, while reinforcing to colleagues, faculty, friends and family, that their work has utility, marketability, rigor and merit. In all, this process is inherently stressful.

DISCUSSION

While illuminating features of the GSSC, including stress experiences influenced by funding competition, department climate, and mentorship/advising relationships, many unforeseen themes arose throughout the interviews. First, the findings describe how graduate students understand, explain and negotiate perceived inequalities – as with their assessments of injustice regarding funding allocation. While students are mindful and frustrated with the perceived unavailability and inadequacy of funding (for research travel, dissertation completion, and the like), their primary concerns are with the lack of transparency regarding how funding is allocated. In this manner, the absence of clear, communicated, department guidelines leads to students' interpretations of the funding process and outcome as unfair. This represents an important contribution to research literature in higher education, which has focused almost exclusively on the inadequacy of funding – i.e., its dollar value – as a graduate stressor. The results here imply that beyond the monetary value

of department funding, it is the communication and transparency of funding decisions that give rise to funding competition.

The consequences of competition – both for funding and status – further illuminate graduate students' stress experiences. Students describe competition as spurring distrust and discord within the student body, often along subfield lines. In this manner, the findings here elucidate the mediation findings in Chapter 3. In those models, stipend values did not differentiate students' stress experiences, although funding competition did. However, the relationship between funding competition and students' psychological distress was mediated by isolation (a stressor). In the interviews described above, students' detail funding competition as having a direct impact on their interpersonal relationships, with friction seeping into the department climate as a result. Combined with the findings above, both the origin and experience of funding competition have a deleterious impact on individual students' experiences of distress, but also come to shape elements of the department climate more broadly. As such, it is possible that the marginal effects I observe from department climate on psychological distress (in Chapters 3 and 4) are the result of poorly specified measures (discussed as a limitation in Chapter 2), rather than mistaken hypotheses. Future research should reconceptualize dimensions of department climate to incorporate elements of competition (for funding and status) as well as communicative measures, such as the transparency of department norms.

Lastly, these interviews provide greater scope of graduate student stressors – including the challenge and insecurity students' experience in crafting and negotiating their academic identities. This finding lends itself to better understanding students' social locations – i.e., students' navigating the liminal space between novice and professional. While scholarship has thoroughly outlined the experience of imposter syndrome among graduate students (Gibson-Beverly 2008), findings here provide detail regarding the process by which these insecurities arise – in some cases, from poorly

communicated department norms, and in other cases, from student comparison to "idealized" others. Research should further explore the mechanisms by which students' social locations contribute to their stress exposure, and investigate other consequences of students' struggles to develop academic identity – including their experiences of *playing defense*.

As these emergent themes were absent and/or inadequately captured in the GSSC, and contribute to the existing literature on higher education and psychological well-being; future work should carefully investigate the role of institutional characteristics in generating student stress, as outlined here.

CHAPTER SIX:

CONCLUSION AND DISCUSSION

While there is much to learn from the research literature on students' mental health experiences, including a thorough scope of the prevalence and severity of mental health challenges, social and academic consequences, and mental health service needs and utilization amongst student populations, there are two marked oversights in the literature. The first, is the absence of structural explanations for the mental health experiences and challenges students endure during their studies. Specifically, there is little emphasis on how and why mental health challenges in student populations manifest in the manner they do. This is a critical oversight as scholars report the psychological distress amongst student populations as beyond that which would be expected in this stage of the life course – i.e., beyond changes related to work, finances, living conditions and social relationships, which otherwise characterize this stage in the life course (Blanco 2008, Walfish 2001). A notable exception, however, are the research studies on mental health service utilization, where some scholars have tried to explain the discernible underutilization of mental health services, particularly those on campus. In this manner, researchers come to find that poor resource utilization is linked to inadequate knowledge of and access to high quality services, insurance and/or financial barriers, misunderstanding of availability and applicability of services, stigma, lack of understanding and support from peers and family, and racial/ethnic cultural norms (Eisenberg 2007, Grady 2014, Hunt 2010, Hyun 2006, Wyatt 2013). In the few studies outside this research area that seek structural explanations, many are limited to undergraduate populations (Benton 2003), some are constrained by small sample sizes

(Goplerud 1980, Grady 2014, Mechanic 1978), and others have few department-level measures (Hodgson 1995, Wyatt 2013).

The second oversight is the lack of consideration for the unique mental health experiences of graduate student populations. By failing to recognize the importance of graduate departments as an institutional context, and the social location of graduate students within them, studies have come up short in detailing students' psychological distress (Grady 2014, Mallinckrodt 1992, Nelson 2001). Overall, the few empirical studies that focus exclusively on graduate student populations are limited by small sample sizes and population subsets such as students in the Professional Schools (Givens 2002, Goplerud 1980, Grady 2014, Mechanic 1978, Nelson 2001, Shapiro 2000, Toews 1997). Fewer still use multi-method approaches to understand how and to what extent graduate students' stress experiences are related to the social and academic cultures of graduate departments. Given this, current literature on student mental health is incomplete regarding the importance of institutions and their prescribed roles and resources, to the stress experiences of graduate students.

To fill the aforementioned gaps, this dissertation tackles the question of whether graduate students' stress experiences are explained by the institutional context of graduate school, and specifically, by the characteristics of students' home departments – most notably the funding structure, mentorship/advising and department climate. I argue that the characteristics of departments, influenced by broad divisional norms, partly explain students' mental health outcomes. Using the stress process model, I contextualize graduate students' mental health experiences, linking stress exposure and access to support resources, with their positions in graduate school.

In doing so, this project makes three noteworthy contributions, which I elaborate in the sections below. First, a substantive contribution to scholarship on education and psychological well-being, by providing a more nuanced understanding of financial strain than appears in the current literature. Second, evidence supporting the role of department climate for graduate students' stress experiences – including issues of transparency, competition and collegiality, and development of academic identity. Lastly, a theoretical contribution to the stress process and higher education scholarship by revealing the greater explanatory power of proximate stressors and resources within departments, relative to cultural norms and academic traditions across broad divisions.

SUMMARY OF RESEARCH FINDINGS

I began this project with an interest in testing whether graduate students' stress experiences differed by division, consistent with scholarship in higher education suggesting that the "hard" and "soft" sciences differ in their social and academic norms. Using the stress process model, I conceptualized relationships between stressors, resources and mental health outcomes, situating them within the contexts of departments, nested in divisions. I used a mixed methods approach to tackle five central questions: 1) Does students' psychological distress vary by division? And if so, are these relationships mediated by department characteristics and/or stressors/resources? 2) Does psychological distress vary by department characteristics? And if so, are these relationships mediated by stressors/resources? 3) Do department characteristics moderate the effects of stressors/resources on psychological distress? 4) Are there differences in the effects of department characteristics and stressors/resources on psychological distress, by gender and race/ethnicity? And 5) How and to what extent do students understand their experiences in

graduate school as stressful, and related to features of their departments? Findings regarding these five central questions are outlined below.

Differences in Psychological Distress by Division, Department Characteristics and Stressors/Resources

Consistent with my hypothesis about broad divisional differences between the "hard" and "soft" sciences, evidence demonstrates that students in the Social Sciences experience greater psychological distress than those in the Natural & Mathematical Sciences. However, contrary to my expectations, these differences are not primarily driven by department characteristics such as the structure of mentorship/advising programs, department climate and funding structure. Rather, these differences are overwhelmingly driven by stressors/resources, which mediate the relationship between divisions and psychological distress. Namely, the greater psychological distress of students in the Social Sciences versus their Natural & Mathematical Science counterparts can be explained by greater time constraints, role overload, role conflict, and isolation, accompanied by poorer funding confidence and relationships with mentors/advisers. As per the literature on doctoral training models and divisional cultures, these results are telling. The "individualized" model of doctoral training, more prevalent in the Social Sciences, may manifest in circumstances especially challenging for students to endure – for example in their greater experience of isolation. In contrast, the "research team" model from the Natural & Mathematical Sciences may help students steer clear of these challenges, or better confront them. Substantively, these differences are meaningful, but empirically they are quite small (as the size of coefficients indicates).

It is also noteworthy that while I expected students from the Arts & Humanities to have similar stress experiences to their Social Science counterparts (i.e., significantly greater distress than students in the Natural & Mathematical Sciences), they did not. This is in direct contrast to my expectations. One explanation is that students' activities outside of their doctoral program – including participation in campus organizations, jobs, community activities, etc. – ameliorate experiences of stress from their department. For example, if students in languages and area studies (Arts & Humanities) are more likely than their Social Science counterparts to participate in cultural events and language groups (which foster community and build networks), this may buffer the stress they are exposed to from aspects of the doctoral program – such as an unsupportive department climate. By building community outside of one's immediate department (where numerous stressors arise) students in the Arts & Humanities may be better equipped to confront and counteract threats to their mental health. Therefore, while their stress exposure may be similar to students in the Social Sciences, their ability and/or propensity to draw upon social and personal resources to counteract stressors may be better.

In all, while divisional distinctions may be useful as an organizational tool for scholars in higher education, distinguishing broad differences in substantive area, empirical techniques, degree time-to-completion and the like, these elements may be less meaningful for delineating students' stress experiences. Given this, we make sense of divisional differences between students in the Social Sciences and Natural & Mathematical Sciences through department cultures, exposure to stressors and access to resources – namely department climate (interaction with students and interaction with faculty), funding competition, time constraints, role overload, role conflict, isolation, funding confidence, faculty support, and mentor/adviser satisfaction. By no means does this suggest context is

unimportant. Rather, this evidence demonstrates that *proximate* institutional contexts instead of broad divisions, are fundamental to shaping students' stress experiences. It is here that this project contributes to the stress process model. As evidenced in Chapter 3, while stressors and resources explain divisional differences in distress, department climate and funding competition are associated with students' psychological distress *independent* of divisional differences. Therefore, students in departments characterized by an unsupportive and competitive climate are at pronounced risk for poor mental health, regardless of their field of study.

The significance of these findings go beyond understanding graduate students' stress experiences, however. For example, unlike neighborhood contexts, the subject of great emphasis in stress research, institutional contexts have prescribed roles, responsibilities, and resources formally designated and administered, which may be socially, physically and psychologically encompassing. In this case, IUB is a large, public institution, that is geographically isolated in a small college town. Further, doctoral students are siloed into their respective departments and programs, and intellectually secluded by the nature and rigor of their work (Grady 2014). In this manner, despite participation being voluntary, graduate programs share a number of characteristics with *total institutions* (Goffman 1961, Grady 2014). However, as a departure from Goffman (1961) and giving nuance to the work of Mechanic (1978), doctoral students regard the intellectual and social isolation they experience as more important for shaping their stress experiences than physical isolation. More importantly though, the social, physical (on-campus) and intellectual isolation students experience are products of the structure and administration of graduate departments and programs themselves. In other words, while individuals in neighborhood contexts have little control regarding neighborhood-level stress exposure and available resources (particularly in

impoverished neighborhoods), graduate departments and programs can be shaped and designed to reduce the stressors and provide the resources necessary for graduate students' to excel. In fact, graduate students and faculty can themselves play a leading role in shaping their respective departments to better support students' mental health. Moving forward, stress researchers can extend our understanding of the stress process by studying the effects of intersecting institutional and neighborhood contexts, such as on military bases. Ultimately, stress research is advanced when our attention is drawn to the significance of institutional contexts and individuals' social locations within them.

What we learn from these data are also important for scholarship in higher education. While students in the Social Sciences have higher psychological distress than their Natural & Mathematical Science counterparts, the stressors/resources they endure, as measured by the GSSC, are contextualized by their graduate departments and doctoral programs. In this manner, we learn something about how graduate students' stress experiences are contextualized and shaped by the department, even while looking at stressors and resources. For example, students reflect on funding by responding to the question: How confident are you that you will have sufficient funds to complete your graduate training? In this manner, survey respondents were asked to indicate their ability to complete graduate training with their financial resources, rather than their ability to weather more general financial strain – such as economic downturn, supporting a family member in financial need, or covering basic living expenses. Given this, mediation of the relationship between divisions and psychological distress by funding confidence tells us that the structure of funding in Social Science departments may be more stressful to their respective students than the structure of funding is to students in the Natural & Mathematical Sciences. It may also tell us something about the types of students who enter these respective fields. In this regard, it is

unclear whether some underlying selection bias is impacting the overall results – i.e., unmeasured differences in the "types" of students who enter fields in the Social Sciences versus those in the Natural & Mathematical Sciences. However, it is likely that department contexts bear some influence on graduate students' stress experiences, given consistent mediation of the relationship between divisions and psychological distress by stressors/resources.

Why then, is there little support for the link between department characteristics and psychological distress? – namely mentorship/advising, department climate and funding structure. Of the six department-level variables[40], three do not predict students' psychological distress – *formal mentorship/advising program, student-initiated mentorship/advising* and *stipend* – each of which were added to the GSSC as supplemental data. This warrants closer scrutiny as scholarship in education is resolved in detailing graduate students' social, academic and stress experiences as related to relationships with faculty and funding.

Regarding the *formal mentorship/advising program* and *student-initiated mentorship/advising program* variables, I believe the problem is twofold – part methodological and part theoretical. The methodological concern regards how the data were collected and coded. By this, I refer to the data source for these variables, which were department websites and responses from department administrators (through requests for information via email). From department websites, I feel confident that the criteria I used to discern whether a mentorship/advising program was formal and/or student or faculty-initiated, was employed consistently (since I did the coding myself). However, it is unclear whether my understanding of a "formal" program or "student-initiated" relationship matched that of department administrators who provided this information, when it could not be ascertained from the department website. In

[40] As a reminder, mentorship/advising formal program was dropped from the mediation analyses in Chapter 3.

fact, it is unclear how these questions were interpreted by department supervisors overall, since no operational definition accompanied the requests for information and whether the information provided was accurate. The implications of this cannot be taken lightly; at a basic level, this raises concerns about the quality of the variable in question, meaning the reliability and validity of the variable, across data sources (myself and department administrators), is questionable. An oversight on my part was not verifying the data I coded from department websites with administrators. In doing so, I might have reconciled the data sources with one another, or at the very least, became aware of discrepancies where they existed.

A related, theoretical concern with these variables provides a much simpler explanation – perhaps "there is no there, there." With no variation in the *formal mentorship/advising program* variable,[41] and no empirical support for the relationship between *student-initiated mentorship/advising programs* and psychological distress, it is quite likely my hypotheses regarding the importance of how student-faculty relationships originate is incorrect. While the existence of faculty support, and the quality and content of student-faculty relationships help predict students' psychological distress outcomes, the origin of these relationships may be inconsequential. An alternative explanation is that programs cannot be meaningfully categorized into a dichotomous system – for example, some departments have faculty-initiated mentorship programs for incoming cohorts, but later require students to initiate their own relationships with faculty advisers. As I operationalized mentorship/advising programs this would constitute a faculty-initiated program, despite being a hybrid system. In this manner, there may be inconsistencies in how the variable categories are applied. A final interpretation is that there may be a distinguishable difference

[41] For details see Chapters 2 and 3.

between how mentorship/advising programs are organized, and the way they actually operate. In other words, there may be a discrepancy in the structure and purpose of a mentorship/advising program, which in reality, operates quite differently than it is outlined in student handbooks and department websites. Without being able to capture the magnitude and direction of this discrepancy across departments, if any, it is unclear whether the structure of mentorship/advising as it is captured in the GSSC accurately captures the effect of mentorship/advising programs on graduate students' stress outcomes.

While in contrast to my expectations, the absence of empirical support for the relationship between students' *stipend*s and their psychological distress is itself an important finding. This is particularly illuminating in tandem with findings from the qualitative interviews. As student narratives reveal, insufficient/inadequate funds are less important as a source of stress than research literature implies, although they create less than ideal circumstances for completing doctoral work. Rather, students describe funding competition as an essential source of stress, primarily by means of contributing to marked rifts in the department climate, which they rely on for support during their doctoral careers. In fact, students describe numerous pervasive and stressful consequences of funding competition – including sub-divisional fractures due to funding disparities, mistrust of colleagues, and opting out of competition for department funds (at the risk of missed professional opportunities). In this manner, while stipends may be consequential for students' social and academic experiences (e.g., as a deciding factor to attend or miss an academic conference), funding competition is particularly noteworthy for students' psychological distress.

For the three department-level variables remaining – department climate (*interaction with students* and *interaction with faculty*) and *funding competition* – evidence is consistent with my expectations. Both *interaction with students* and *interaction with faculty* are marginally significant

predictors of students' psychological distress, such that greater interaction is associated with lower distress. Funding competition is a statistically significant predictor of students' psychological distress such that greater funding competition is associated with higher psychological distress. While I knew the measures for department climate in the GSSC were crude, as discussed in Chapter 2, it became clear from students' accounts in the qualitative interviews that *interaction with students* and *interaction with faculty* captured only one of the multidimensional features of department climate – interaction. For example, beyond the communicated need for opportunities to socialize, meet and evaluate potential faculty mentors/supervisors, which the GSSC variables capture, students describe department climate as an intermingling of social and academic norms (regarding markers of progress and "idealized" student success); isolation, mistrust and insecurity (in the struggle to craft and defend one's academic identity); and poorly communicated administration (regarding funding allocation). This complex assortment of factors, highlight particularly stressful components of the doctoral career, and are not captured by the GSSC measures of department climate. Therefore, I regard department climate as of continued importance to understanding graduate students' stress experiences, but one that requires greater specification in future quantitative research.

Funding competition, on the other hand, is a statistically significant predictor of students' psychological distress – and the only department-level variable to do so. While this relationship occurs in the manner I predicted, such that greater funding competition leads to higher psychological distress amongst students, funding competition does not differentiate the greater psychological distress of students in the Social Sciences from their Natural & Mathematical Science counterparts.

Nevertheless, I emphasize the importance of funding competition to understanding graduate students' stress experiences by drawing upon the qualitative analysis. As mentioned above, students' comprehension and experience of stress from funding reveal greater complexity than at first glance. Specifically, students' frustration with funding competition stems, in part, from their interpretations of the *fairness* and *clarity* of criteria upon which funding is allocated. On the one hand, some students perceive the system as unjust, given that there is not enough funding for those who need and/or want it. Other students cite a lack of transparency at the root of this injustice. In other words, their frustration is linked to poor or inadequate understanding of the "rules" with which these decisions are made. Others disagree regarding the principles upon which funding *should* be based – whether one of the multiple rule systems that can lead to distributive justice (e.g., equality vs. equity vs. consideration of need), or procedural justice.

The complexity of students' understanding of funding competition cannot be overstated – beyond the discord arising in department climate from competition over scarce funding resources, students actively attempt to reconcile issues of fairness and clarity at the heart of funding competition. As this project reveals, many students experience stress from both competition itself, but also from the misread equivalence of clarity and fairness. When students equate these concepts, their incomplete knowledge regarding how funding is allocated manifests in skepticism about the process, including the administration. As a result, both the experience and the cognitive processing of funding competition have deleterious outcomes for students' psychological distress and their department climate.

The mixed methods approach utilized for this project not only helps identify funding competition as a predictor of students' psychological distress, but also underscores the mechanisms by which funding competition impacts students' psychological distress.

Differences in Psychological Distress by Moderators

Beyond differences in psychological distress by division, department characteristics and stressors/resources, this project assessed whether predictors of psychological distress (stressors/resources and department characteristics) had varied effects, depending on department characteristics, gender, and race/ethnicity. While numerous models were run, very little moderation was observed.

One department moderator demonstrates a statistically significant interaction – i.e., interaction with students moderates the effect of mentor/adviser relationships on psychological distress. Substantively, this means the benefit of supportive mentor/adviser relationships on psychological distress is enhanced when students come from a supportive department climate (as measured by interaction between graduate students). While this is the only significant moderation effect by conventional standards, it is consistent with my hypothesis about how department climate should contribute to better graduate student mental health, and contributes to literature on faculty support. Specifically, it emphasizes the importance of department contexts for capitalizing on the benefits of faculty support and student-faculty relationships.

Nevertheless, the question remains: What explains the absence of evidence supporting other moderation hypotheses? There are two explanations I outline here – the first regarding lack of moderation by race/ethnicity, and the latter to weak evidence of moderation from department characteristics. 1) Limitations of the data – as the GSSC has a small number of racial/ethnic minority students (~10%), and smaller cell sizes for subgroups within (Blacks or African Americans = 4.2%, Asian or Asian American = 3.8%, Hispanics or Latino/a = 2.3%, American Indian or Alaskan Native = 1.3%, Native Hawaiian or Pacific

Islander = .2%, and Other = 2.7%), it may be difficult to discern differences across students by race/ethnicity when the variable is dichotomized (i.e., between whites and racial/ethnic minority students). This is particularly difficult (and problematic) if racial/ethnic minority subgroups vary widely in their doctoral and/or stress experiences. Future research will require targeted recruitment and incentive strategies for quantitative and qualitative data collection in order to reduce and/or eliminate these data limitations.

2) Poor variable specification – With regard to department characteristics, one could argue that those specified in the GSSC do not adequately capture the central features of departments (as my remarks regarding the multidimensionality of department climate above suggest). As such, the stress process model *would* provide empirical support for moderation, if elements of transparency, academic identity, and department administration were more adequately captured.

Graduate Reflections on Doctoral Study and Stress Experiences

In the qualitative interviews, I sought insight into the daily experiences of graduate students in their home departments – particularly regarding their academic training, relationships with faculty and colleagues, and understanding of their own stress experiences. Despite the weak explanatory power of department characteristics for understanding graduate students' psychological distress (in Chapters 3 and 4), findings from the qualitative analysis draw attention to mechanisms by which doctoral students come to experience and understand their own stress – some of which are fundamentally at the department-level. In questioning whether students understand their mental health experiences as related to the structure of funding, mentorship/advising relationships and department climate, three noteworthy patterns arose – 1) competition, both for funding and status, is a precursor to a toxic

department climate, 2) students' stress from the structure of funding is linked to notions of justice and fairness regarding its allocation, less so than its insufficiency, and 3) students play defense – i.e., defend their academic identities, their research, and their divisions against criticism from academic and non-academic peers.

Students' assessments of funding competition, as pervasive and divisive, were intimately tied to issues of justice and fairness. Ultimately, students were unclear about the rules/criteria upon which funding decisions were made, and interpreted this lack of clarity as the product of an unfair process. Beyond students who described the competitive and isolating experiences of funding competition in their departments (as described earlier), other students, using the same logic, described their collegial and supportive departments as related to the absence of funding competition. In this regard, students' descriptions of experiences with funding were consistent; both students who received department financial support and those who did not experienced the challenges and consequences of funding competition in the social climate of their departments.

While less prevalent and cohesive than students' experiences of funding competition, competition for status was an additional theme arising from the qualitative interviews. Students described vying for faculty attention or competing to reach degree milestones before fellow colleagues or relative to "idealized" others. In their pursuits, the broader social and academic climate of the department suffered. While some students couched this competition in feelings of insecurity and imposter syndrome, these experiences came to characterize departments as unfriendly and divisive. In fact, despite the prevalence of insecurity that students overall highlighted, there appears a propensity toward *saving face* and *lack of transparency* in graduate departments, leaving toxic occurrences like competition for status unchecked.

Beyond the funding and status competition highlighted above, the qualitative interviews in this project also illuminated additional stressors. Some shed light on developments in the mental health and education literature, such as students' difficulty navigating and negotiating mentorship/advising relationships, and imposter syndrome. Others – *playing defense* – were new developments. Playing defense was characterized by students' efforts to justify and validate their work in response to criticism from 1) academic colleagues, and 2) non-academic peers and family. In both instances, doctoral students described feeling pressured to rationalize and substantiate their work against verbalized criticism. In the case of academic colleagues, students were confronted with questions regarding the integrity and research trajectory of their substantive work, often in unsolicited interactions. In this manner, they were compelled to defend both their academic identity and the relevance of their work. From non-academic peers and family, students in the Social Sciences and Arts & Humanities exclusively described validating their substantive interests, as well as the merit, rigor, utility and marketability of their doctoral work and degree. Unsurprisingly, students who reported playing defense were frustrated and stressed with having to legitimate their work and career choices, often to those who did not or could not understand their research contributions and motivations.

As is a common experience for graduate students overall, experiences with playing defense highlight an important socio-psychological contribution to the literature on mental health and education – formation of academic identity. In other words, playing defense is stressful precisely because it is a careful negotiation between crafting and locating scholastic identity, while simultaneously developing value in one's work. In the face of students' insecurity, negotiating the liminal space between novice and professional is paramount to

crafting an academic identity – understanding this process and the stakes of doing so successfully, is paramount to understanding graduate students' stress experiences.

FUTURE WORK

Over the lengthy period of students' doctoral training, and with the current changing academic climate – e.g., with shrinking budgets and uncertainty in the academic job market – research on graduate students' academic and stress experiences is timely. As such, the significance of department contexts to understanding graduate students' stress experiences will be a focal point in my future research. At a basic level, I hope to better understand how and why funding competition outweighs financial constraints (such as funding inadequacy) in explaining graduate students' stress experiences, which has been given substantial weight in education scholarship (Grady 2014, Hodgson 1995, Wyatt 2013).

In addition, I would like to explore how students understand their own social locations, since issues of identity, insecurity and *playing defense* came to the fore in the qualitative interviews. These emergent themes illuminate that graduate students may experience context-specific stressors, such in negotiating their liminal position (intra-role conflict) within academia, and between academic and non-academic spaces (inter-role conflict). In a related vein, I see value in examining how students engage in social comparison with idealized others, negotiating their value and worth through academic work and career choices. In learning the social and academic expectations of the doctoral program (under the supervision of faculty) and simultaneously crafting their own academic identities, it seems graduate students engage in a cognitive process that, while necessary, is incredibly stressful. As of my recent engagement in the scholarship on higher education and students'

psychological well-being, I have not come across qualitative research that explores these issues amongst the graduate student population.

Beyond the research I will personally pursue, the findings from this dissertation offer other scholars avenues for future work – first, there is need for researchers to collect better quality data on the mental health experiences of graduate students. At a minimum, this includes data collected with multi-stage, cluster, random sampling to account for students' nested in departments, (for HLM); strategic recruitment and incentives for students from racial/ethnic minority backgrounds; and multidimensional measures of department climate (including indicators of academic growth and identity, transparency and intra-departmental communication, academic administration, etc.), coping (e.g. mastery, self-esteem, etc.), and discrimination (by gender and race/ethnicity). In addition, longitudinal data would allow for researchers to assess the causal mechanisms linking graduate students' stress experiences to their departments and divisions, in a manner cross-sectional data cannot. While a vast literature describes the stress and mental health experiences of undergraduate students, including prevalence, social and academic consequences and subsequent health service utilization, graduate students and graduate school present a unique and complex combination of social actors and contexts, manifesting in students' multifaceted distress outcomes. The need for high quality data to capture these nuanced and unique experiences cannot be overstated.

Secondly, and related to the first, data must be collected with the express purpose of oversampling racial/ethnic minority groups, which are generally underrepresented in graduate programs. As cell sizes should be reasonably large to test moderation hypotheses, quality data on the experiences of racial/ethnic minority graduate students is a must. This necessity for quality data extends to the need for qualitative data as well. The tremendous

difficulty I had recruiting racial/ethnic minorities to participate in this research was likely a product of poor timing in the academic calendar as well as a small racial/ethnic minority graduate population overall. As such, timing, incentives and targeted sampling strategies should be coordinated.

Lastly, it is worthwhile for scholars to examine the current literature on mental health amongst graduate students as this may illuminate the non-findings in this dissertation regarding the indistinguishable psychological distress outcomes of students in the Arts & Humanities and Professional Schools, relative to their Natural & Mathematical Science counterparts. While I remain puzzled by the mystery of students in the Arts & Humanities, I speculate that students in the Professional Schools, much like their Natural & Mathematical Science counterparts benefit from access to resources which are built into the program itself (e.g., such as professional networking organizations and events). As a start, my dissertation points to poorer department climate (as measured by interaction between students) and greater funding competition for students in the Professional Schools compared to those in the Natural & Mathematical Sciences. Bridging the findings from this research and that which exists in the literature is an important next step.

POLICY IMPLICATIONS

Beyond the methodological and theoretical contributions of this research, and the trajectories for future work outlined above, the findings presented here have policy implications for the structure of graduate departments/programs, and institutions of higher education writ large. In light of these, I recommend two policy initiatives – 1) resource investment in department climate, and 2) targeted mental health resources for students in doctoral programs.

1) Regarding investments in department climate, the areas where students expressed greatest need require little funding. By addressing issues of transparency and clarity – as with funding decisions – concerns regarding funding allocation will likely dissipate. In doing so, faculty and graduate administrators may potentially reduce the funding competition that plagues graduate departments across divisions, even when stipends are deemed inadequate (in terms of value) or insufficient (in terms of meeting the volume of student demand). This is particularly useful given widespread budget constraints on graduate departments in the last several years – rather than change the funding packages offered to incoming students, or reduce the number of incoming students accepted in graduate cohorts, greater transparency and clarity regarding how funding decisions are made provides a simple but potentially effective solution to avoiding toxic department climates.

Further, a push toward greater transparency and clarity may help faculty successfully communicate to students that the openness, cohesion and support of their department climate is a priority. In complement, graduate students would benefit from departments that make a concerted effort to organize and execute activities where students and faculty can interact – both to spearhead professional socialization, but also so students and faculty can meet one another for potential mentorship/advising relationships. While this does not immediately address an issue of transparency, these efforts will contribute to the department climate from which students as a whole may benefit. In fact, the benefits of improving department climate through collegiality, facilitating transparency and clarity, and reducing isolation and insecurity are paramount to reducing students' stress and improving their graduate experiences.

2) Given the widespread underutilization of mental health resources amongst graduate populations[42], especially on campus, the development of targeted mental health resources for students in doctoral programs is a worthwhile endeavor. By "targeted" I refer to the findings from this research which highlight the context-specific stressors students endure and resources they utilize. Some of this comes back to a call for greater transparency and clarity. It is well established that underutilization of campus mental health resources results, in part, from a lack of knowledge regarding availability, eligibility, applicability and cost (Eisenberg 2013, Grady 2014, Hyun 2006). However, there is also some evidence to suggest that vast mental health resources on college campuses are targeted toward undergraduate populations, or toward acute rather than chronic instances of stress (Hunt 2010, Hyun 2006) – both of which do not adequately attend to the complex stress experiences of graduate students. Recognizing this, graduate departments should work with campus mental health service providers to identify resources beneficial for the graduate student population – including tools for diminishing isolation (both physically from peers after coursework completion and intellectually from colleagues and family/friends), approaches to improve communication with colleagues and faculty (to prevent toxic department climate and negotiate student-faculty mentorship/advising relationships), and strategies to negotiate the liminal position of graduate student roles (including approaches to developing esteemed academic identities).

[42] While graduate students at IUB utilize campus resources in proportion to their population size (compared to the undergraduate population), this is an exception to broader national trends. The policy recommendation here attends to the need outlined in the student mental health and higher education literature.

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APPENDICES

Appendix A

Table A2.1: Comparison of Unweighted and Weighted Sample Characteristics for Gender, Race and Degree Type

Student Characteristic	Unweighted Sample (%)	Population (%)	Weighted Sample (%)
Gender			
Men	36.0	52.4	52.4
Women	64.0	47.6	47.6
Race			
White	74.3	57.7	57.7
Person of Color	9.0	16.2	16.2
International[43]	16.8	26.1	26.1
Degree			
Master's	46.8	52.3	52.3
Doctoral	53.2	47.7	47.7
Number of Students (N)[44]	1558	9551	9551

Source: Sample from GSSC 2014 Survey; population data from "Indiana University Enrollment First Semester 2013-14" report.

[43] For consistency with the *Indiana University Enrollment First Semester 2013-14 Report*, international student status is reported within the broader race category. However, the GSSC asks questions about race and international student status independently, and therefore, weights are calculated independently.

[44] The students represented in this descriptive table (N=1558) exclude those with missing values on the k6 mental health outcome measure.

Table A3.1 OLS Regression Model of Psychological Distress on Departments within Social Sciences

	Model 1
Social Sciences	
Sociology	0.004
	(0.15)
Economics	0.06
	(0.37)
Political Science	0.10
	(0.24)
Geography	0.93*
	(0.37)
Criminal Justice	0.46
	(0.37)
Gender Studies	0.67*
	(0.28)
Anthropology	0.38*
	(0.17)
Linguistics	0.18
	(0.27)
Second Language Studies	0.87+
	(0.47)
Telecommunications	0.06
	(0.37)
Arts & Humanities	0.14
	(0.10)
Professional Schools	0.12
	(0.09)
N	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A3.2 OLS Regression Model of Psychological Distress on Departments within Arts & Humanities

	Model 1
Arts & Humanities	
Philosophy	-0.15
	(0.32)
American Studies	0.20
	(0.48)
English	0.10
	(0.14)
History	0.0001
	(0.19)
Folklore and Ethnomusicology	0.22
	(0.25)
Communication and Culture	0.29
	(0.25)
History of Art	0.37
	(0.48)
Central Eurasian Studies	0.81+
	(0.48)
Religious Studies	0.15
	(0.34)
Theatre Drama and Contemporary Dance	-0.58
	(0.58)
Near Eastern Languages and Cultures	0.76
	(0.82)
French and Italian	0.19
	(0.37)
Spanish and Portuguese	0.37+
	(0.22)
Social Sciences	0.23*
	(0.10)
Professional Schools	0.12
	(0.09)
N	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A3.3 OLS Regression Model of Psychological Distress on Departments within the Professional Schools

	Model 1
Professional Schools	
Music	0.52
	(0.41)
Musicology	0.06
	(0.30)
Music Theory	-0.40
	(0.58)
Music Education	0.69
	(0.82)
Optometry	-0.98
	(0.82)
Kinesiology	-0.07
	(0.28)
Education	0.15
	(0.19)
Curriculum and Instruction	0.03
	(0.19)
Educational Leadership and Policy Studies	-0.13
	(0.28)
Literacy, Culture and Language Education	-0.48
	(0.82)
Instructional Systems Technology	0.35
	(0.82)
Counseling Education and Psychology	0.20
	(0.21)
Public Health	-0.73+
	(0.41)
Applied Health Science	-0.19
	(0.41)
Epidemiology and Biostatistics	-0.31
	(0.58)
Informatics	0.42
	(0.37)
Information and Library Science	-0.59
	(0.48)
Business	-0.02
	(0.41)
Journalism	-0.11
	(0.37)
Recreation, Park, and Tourism Studies	-0.18
	(0.34)
Computer Science	-0.48
	(0.47)
Social Sciences	0.16+
	(0.10)
Arts & Humanities	0.06
	(0.09)
N	540

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Appendix B:

Table B2.1: Descriptive Table for Interview Respondents

#	Pseudonym	Age	Sex	Race/Ethnicity	Marital Status	International Student?	Division	Year of Enrollment
1	Lisa	32	F	White/ Caucasian	Single	No	A&H	2010
2	Janet	28	F	Black/African American	Single	No	A&H	2010
3	Glen	29	M	White/ Caucasian	Married	No	A&H	2011
4	Martin	35	M	White/ Caucasian	Married	No	N&M	2013
5	Joseph	32	M	White/ Caucasian	Single	No	A&H	2009
6	Chris	34	M	White/ Caucasian	Single	No	A&H	2004
7	Andrew	23	M	White/ Caucasian	Single	No	N&M	2015
8	Erica	25	F	Black/African American	Single	No	A&H	2012
9	Carolyn	28	F	White/ Caucasian	Single	No	SS	2012
10	Natasha	26	F	White/ Caucasian	Single	No	A&H	2012
11	Lara	30	F	White/ Caucasian	Single	No	A&H	2010
12	Anna	24	F	White/ Caucasian	Single	No	N&M (dual PhD)	2014
13	Irene	26	F	White/ Caucasian	Single	No	A&H	2012
14	Nick	31	M	White/ Caucasian	Single	No	SS/ Professional School (dual PhD)	2010
15	David	33	Male (FTM Trans)	White/ Caucasian & Asian/Asian American (mixed race)	Single	No	A&H	2006
16	Kim	27	F	White/ Caucasian	Single	No	A&H	2011
17	Paula	25	F	White/ Caucasian	Single	No	SS	2013

18	Doreen	23	F	Other (Middle Eastern/ North African)	Single	No	SS	2015
19	Abigail	25	F	White/ Caucasian	Single	No	N&M	2013
20	Audrey	24	F	White/ Caucasian	Single	No	SS	2015
21	Hannah	28	F	White/ Caucasian	Married	No	SS	2013
22	Kyla	28	F	White/ Caucasian	Married	No	SS/A&H (dual PhD)	2014
23	Julie	49	F	White/ Caucasian	Divorced	No	SS	2009
24	Markus	31	M	White/ Caucasian	Single	No	A&H	2007
25	Renee	25	F	Black/African American	Single	No	N&M	2013
26	Nadine	30	F	White/ Caucasian	Single	No	A&H	2010
27	Patrick	35	M	White/ Caucasian	Married	No	A&H	2013
28	Sharon	29	F	White/ Caucasian	Single	No	A&H	2011
29	Chloe	40	F	Hispanic/ Latino/a	Divorced	No	N&M	2013
30	Brayden	30	M	Black/African American	Single	No	N&M	2014
31	Steve	28	M	Black/African American	Single	No	N&M	2012
32	Phil	35	M	White/ Caucasian	Married	No	SS	2013

Table B2.2: Focus Group Participants

Interview #	Age	Sex	Race/Ethnicity	Marital Status	International Student?	Division	Year of Enrollment
0001F	40	F	Black/African American & Asian or Asian American	Single	No	A&H	2011
0002F	26	F	Black/African American	Single	No	SS	2014
0003F	24	F	Black/African American	Single	No	A&H	2013
0004F	31	F	Black/African American	Single	No	A&H	2010

Table B2.3: Summary of Qualitative Codes

Node	Refers to:	Sub Nodes	Refers to:	Potential query pairings
Advice	Advice given by students for incoming or potential new students	N/A		
Competition	Relating to feelings of competition or solidarity between students	N/A		Departmental Climate, Funding, Transparency
Departmental Climate	Social Climate, Atmosphere,	N/A		Identity, Competition, Faculty, Support
Funding	Discussions of funding situation positive or negative	N/A		
Future Potential	i) Impressions or anxiety regarding future success in academia or in workforce.	N/A		Support; Faculty; Program Design/ Regulation; Transparency. - Stress about future outcomes often linked to support to achieve academic success or seek jobs outside academia.
	ii) Discussions about precarity/inconsistency of academic experiences relating to immediate future.			Funding; Transparency,
Hazing	Experiences or perceptions of mentorship	N/A		
Identity	Relates to personal identity, including sub node categories and class or other personal identities.	Gender		
		Race		
		Religion		
		Sexuality		
Mentorship	Experiences or perceptions about mentorship, including experiences distinct from academic advising.			
Other Stressors	i) Health issues	Imposter Syndrome	Feelings of fraudulence-questioning competency/abilities/ accomplishments in face of success or achievements.	Gender
	ii) Outside perceptions about the legitimacy or difficulty of PhD completion			Social Sciences, Humanity
	iii) Outside perceptions specific to field of study (see also: Program Design/Requirements			Social Sciences, Humanity

Node	Refers to:	Sub Nodes	Refers to:	Potential query pairings
Support	Experiences or perceptions of support, relating to sub-node categories and other parties (department support staff, student services, CAPS, etc.)	Faculty	Experiences of support or lack of support from faculty.	Mentorship, Transparency
		Isolation	Experiences of isolation (physical, social, emotional, etc.)	Race, Gender, Identity
		Outside Support	Relating to support from those outside Academia (eg: spouse, family, non-school or non-department friends).	
Teaching	Experiences of teaching and its impact on academic experience			
Transparency	Transparency regarding funding, program regulations or requirements, or graduate experience more generally.			

Department Supervisor Information Request Form

Hello,

Under the supervision of Dr. Jane McLeod, Professor of Sociology and Associate Dean for Social & Historical Sciences and for Graduate Education, I am conducting dissertation research on the academic and mental health experiences of graduate students at IU. In this regard, I would like your help to better understand how stipends and mentorship/advising for doctoral students are organized in your department/program. If you could please answer the 3 questions listed below, I would greatly appreciate it. If you have any questions about the study, please do not hesitate to contact me at rlatouch@indiana.edu. With thanks,

Rachel La Touche, PhD Candidate

Questions

1.What was the average SAA stipend for incoming doctoral students in 2012-2013? (If you do not have figures from 2012-2013, please report the average stipend from the next closest academic year)

Stipend Value: $
Academic Year:

2. What is the average time-to-degree completion (TTD) for doctoral students in your department/program?

Time-to-degree (in years):

3. Does your department/program offer a formal mentorship/advising program for incoming doctoral students?

YES [ ]

NO [ ]

3b. If yes, is this mentorship/advising program student-initiated (doctoral students are responsible for choosing a mentor/adviser) or faculty assigned (faculty members are assigned to incoming students)?

Mentorship/Advising Program is student-initiated [ ]
Mentorship/Advising Program is faculty assigned [ ]
Other (please explain):

Thank you for your help in contributing to this research!
(IRB Protocol # 1601494418)

Interview Guide

Thanks for agreeing to be part of this interview. I appreciate your willingness to participate in my dissertation research and share your thoughts with me. My interest is in better understanding the day-to-day experiences in your department and to see if these are in any way connected to how you experience stress. I am especially interested in your thoughts about faculty mentorship and advising relationships, social and academic experiences, and the overall climate in your department. Before we begin though, how about we start with you telling me a little bit about yourself. What's your name, what stage are you at in the doctoral program and what department are you from?

Introductions

Ok great, so I'd like to start by talking about the culture in your department.

Department Climate

I'm interested in both the social and academic environment in your department as a whole – for example…

1. What does the social climate in your department look like between faculty and students? [If clarification is needed: For example, do faculty and students ever socialize informally?] (Probes: How so? Who arranges these social events/meetings? What do you mean by that? Has anyone else had a similar experience? Has anyone else have a different experience?)

2. And what about amongst students, what does that social climate look like? Are there events hosted in your department that contribute to this climate? What are those events like? Fun? Supportive? Stressful? (Probes: How so? What do you mean by that? Has anyone else had a similar experience? Has anyone else had a different experience?)

Ok I'm starting to get a better idea of what your department looks like – but now let's talk a little bit about the academic side of things

3. How typical is it for faculty members in your department to collaborate with graduate students on academic projects, like articles and/or conference presentations? (Probes: What do you mean by that? Can you give me an example of what you mean? It sounds like you are saying _____, is that a fair summary?)

And what about if you were preparing your own independent work, like _____(e.g writing a grant, preparing for qualifying exams, developing a course, applying for a job),[45]

4. Would faculty members help you with preparing work like this? How so? (Probes: Can you give me an example? Tell me a bit more about how that works?)

5. And beyond the faculty members, does your department provide any resources for helping you do this kind of work? What do those resources look like? (Probes: Can you give me an example? Tell me a bit more about how that works?)

[45] If participant has mentioned grant writing and/or teaching before this point, I will use either of those examples, if not, I will use the example of applying for a job which should apply more generally across departments.

So if you think about the department climate as a whole; both the social and academic side of things including the faculty, students and resources you've mentioned…

6. Would you say that these have influenced your progress/success in the program? (Probes: Can you give me an example? Tell me a bit more about how that works)

7. Would you say that the department climate has influenced the stress you feel while pursuing your degree? Why or why not? (Probes: Can you give me an example? Tell me a bit more about how that works)

Well that gives me some great insight into your department, I'd like to hear more though about your specific relationships with faculty…

Mentorship/Advising Structure

8. Would you say you *have* a faculty adviser, and if so, what does that relationship look like? (Probes: What do you mean by that? Can you give me an example of what you mean? It sounds like you're saying _____, is that a fair summary?)

- *[If definition is required: By faculty adviser, I mean the faculty member you rely on to walk you through the integral steps of degree completion, including coursework, qualifying exams, the proposal defense, etc.]*

    a. Would you say you and your faculty adviser are a good fit? (If clarification is needed: In other words, would you say that your faculty adviser meets your expectations in the way that he/she advises you?) (Probes: What do you mean by that?)

    b. Do you ever find the relationship with your adviser stressful? How so? (Probes: What do you mean by that? Can you give me an example of what you mean?)

And what about a faculty mentor? – meaning a faculty member that helps you beyond immediate research projects –for example with guidance regarding career options, advice on maintaining work/life balance and the like.

9. Would you say you *have* a faculty mentor, and if so, what does that relationship look like? (Probes: What do you mean by that? Can you give me an example of what you mean? It sounds like you're saying _____, is that a fair summary?)
    a. Would you say you and your mentor are a good fit? (If clarification is needed: In other words, would you say that your mentor meets your expectations in the way that he/she mentors you?) (Probes: What do you mean by that? Can you give me an example of what you mean? It sounds like you're saying _____, is that a fair summary?)

    b. Do you ever find the relationship with your mentor stressful? How so? (Probes: What do you mean by that? Can you give me an example of what you mean?)

Isolation

This is all really helpful information. I noticed you mentioned feeling isolated from colleagues and faculty in your

department; I'd like to talk about that a little more. [If the respondent has not talked about isolation: I noticed you didn't mention feeling isolated from colleagues and faculty in your department. This is something that graduate students in past interviews have mentioned, so] …

10. Do you ever feel isolated from others in your department, such as colleagues or faculty? How so? If not, why not? (Probes: Can you give me an example? Tell me a bit more about that)

You know it's interesting that you say _____(reintroduce a theme from the discussion about isolation) because some of the literature in higher education suggests graduate students experience isolation in multiple ways – socially, physically and/or intellectually. [If clarification is required: social isolation = little to no connection to students beyond academic work, physical isolation = separated work space, intellectual isolation = no overlap in substantive research interests]

11. Would you say you've experienced these specific kinds of isolation? (Probes: How so? Can you give me an example?)

12. Does feeling isolated influence your ability to make progress/be successful in the program? How so?

Closing Questions

[If applicable, respondent will be asked question 13 below, to gain insight and further details about patterns emerging from the survey data. If no patterns from the survey data require explication, the survey will close with question 14.]

This is all really helpful for me to better understand your experience in _____ department. We're coming to the end of the interview now, but I wonder if I can get your thoughts on an interesting pattern I noticed from a survey conducted at IU in 2013, called the Graduate Student Stress and Coping Survey (GSSC).

13. Based on the survey data, there seems to be an interesting relationship between _____ and _____ amongst students in the _____ (division). That is, graduate students in _____(division) seem to suggest that _____ (specify the direction of the relationship), but I'm not sure whether this truly reflects the reality of the entire division. Do you have any thoughts or insights about this?

Ok great I appreciate your thoughts on that; I have one last question for you.

14. Given all that we've discussed today, if you had any advice for an incoming graduate student to your department, what would that advice be?

Well if you don't have any questions you'd like to share at this time, I'd like to thank you all for your honest feedback and for taking time out of your schedule to share your thoughts with me.

Interview Recruitment Text (Email)

The message below is meant for doctoral students in your department. I appreciate your willingness to pass this along:

My name is Rachel La Touche and I am a doctoral candidate in the Sociology Department here at Indiana University – Bloomington. Under the supervision of Dr. Jane McLeod, I am conducting interviews with graduate students about their challenges and stress experiences throughout graduate school. Specifically, the goal of this research is to understand department sources of stress for doctoral students, including funding, mentorship/advising relationships, and overall department climate. Your participation is important to help prospective doctoral students, department administrators, mental health professionals and institutional leaders understand the specific challenges faced by doctoral students. I hope that you will participate whether or not you have faced serious challenges in graduate school so that the results will accurately reflect the range of student experiences.

If you are currently enrolled as a full-time, doctoral student at Indiana University in the Social Sciences, Natural & Mathematical Sciences and/or Arts & Humanities, and are a US citizen, you are eligible to participate in this exciting new study. Participation will include one interview lasting between 60-90 minutes, scheduled at a time and location of your choice. Participation is voluntary and all responses will be kept confidential. You will receive a $10 Target gift card for your participation in this study. Leaving the study at any point will not result in penalty or loss of benefits to which you are entitled.

I greatly appreciate your time and any responses you may share by agreeing to participate in this study. I also appreciate you sending this recruitment email along to anyone you know who might be interested. For more information, please see the attached study information sheet. If you have any questions about the study, please direct all inquiries to Rachel La Touche atrlatouch@indiana.edu. Thank you for your time,

Rachel La Touche

Protocol # 1601494418
<IRB Study Information Sheet Attached>

Focus Group Recruitment Text (Email)

Hi BGSA Members,

My name is Rachel La Touche and I am a doctoral candidate in the Sociology department here at Indiana University. Under the supervision of Dr. Jane McLeod, I am conducting a focus group session with male, Black and/or African American graduate students about their challenges and stress experiences throughout graduate school. If you are eligible and would like to participate, please sign up at the following link --> http://doodle.com/poll/8kzsrnmc24z8yva2

As a participant, you will be helping prospective doctoral students, department administrators, mental health professionals and institutional leaders understand the specific challenges faced by doctoral students of color. I hope that you will participate whether or not you have faced serious challenges in graduate school so that the results will accurately reflect the range of student experiences.

Eligibility Criteria

If you are currently enrolled as a full-time, doctoral student at Indiana University in the Social Sciences, Natural & Mathematical Sciences and/or Arts & Humanities, are a US citizen, identify as male and identify as Black and/or African American, you are eligible to participate in this exciting new study. Participation will include one video recorded focus group session lasting approximately 60 minutes, scheduled at a mutual time and location. You will receive a $10 Target gift card for your participation in this study. Leaving the study at any point will not result in penalty or loss of benefits to which you are entitled.

I greatly appreciate your time and any responses you may share by agreeing to participate in this study. I also appreciate you sending this recruitment email along to anyone you know who might be interested. If you have any questions about the study, please direct all inquiries to Rachel La Touche at rlatouch@indiana.edu. Thank you for your time,

Rachel La Touche

Protocol # 1601494418
<IRB Study Information Sheet Attached>

IRB STUDY #1601494418

INDIANA UNIVERSITY STUDY INFORMATION SHEET FOR

Departmental Contexts as a Source of Differential Risk

You are invited to participate in a dissertation research study about the challenges and stress experiences of doctoral students Indiana University. You are eligible as a possible subject for this study if:

- ✓ You are currently enrolled as a full-time doctoral student,
- ✓ In the Social Sciences, Natural & Mathematical Sciences or Arts &Humanities at Indiana University
- ✓ **and** a US citizen.

This study is being conducted by Sociology doctoral student, Rachel La Touche, under the supervision of Dr. Jane McLeod.

STUDY PURPOSE:

The purpose of this study is to understand department sources of stress for doctoral students, including funding, mentorship/advising relationships, and overall department climate.

PROCEDURES FOR THE STUDY:

To participate in this study, we ask that you agree to fill out a student background form (with basic demographic information) and participate in a 60-90 minute interview at a time and location amenable to your schedule. This interviews will be audio recorded for transcription purposes and audio files will be kept securely (via an external drive) in a locked office in Weatherly Hall 132.

CONFIDENTIALITY:

Efforts will be made to keep your personal information confidential. Your identity will be held in confidence in reports in which the study may be published and databases in which results may be stored.

Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the study investigator and his/her research associates, the Indiana University Institutional Review Board or its designees, and (as allowed by law) state or federal agencies, specifically the Office for Human Research Protections (OHRP).

PAYMENT:

You will receive a $10 Target gift card for your participation in this study.

CONTACTS FOR QUESTIONS OR PROBLEMS

For questions about the study, contact the researcher Rachel La Touche at rlatouch@indiana.edu or [**812-679-8607**].

For information about your rights as a research participant or to discuss problems, complaints or concerns about a research study, contact the IU Human Subjects Office at (317) 278-3458 or [for Indianapolis] or (812) 856-4242 [for Bloomington] or (800) 696-2949.

VOLUNTARY NATURE OF STUDY

Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time. Leaving the study will not result in any penalty or loss of benefits to which you are entitled. Your decision whether or not to participate in this study will not affect your current or future relations with your department or Indiana University.

IRB STUDY #1601494418

INDIANA UNIVERSITY STUDY INFORMATION SHEET FOR

Departmental Contexts as a Source of Differential Risk

You are invited to participate in a dissertation research study about the challenges and stress experiences of doctoral students Indiana University. You are eligible as a possible subject for this study if:

- You are currently enrolled as a full-time doctoral student,
- In the Social Sciences, Natural & Mathematical Sciences or Arts &Humanities at Indiana University
- and a US citizen.

This study is being conducted by Sociology doctoral student, Rachel La Touche, under the supervision of Dr. Jane McLeod.

STUDY PURPOSE:

The purpose of this study is to understand department sources of stress for doctoral students, including funding, mentorship/advising relationships, and overall department climate.

PROCEDURES FOR THE STUDY:

To participate in this study, we ask that you agree to fill out a student background form (with basic demographic information) and participate in a 60-90 minute group interview at a time and location amenable to your schedule. This group interviews will be audio recorded for transcription purposes and audio files will be kept securely (via an external drive) in a locked office in Weatherly Hall 132.

RISKS AND BENEFITS:

There is a potential loss of confidentiality.

There is no direct benefit to participating in this study.

CONFIDENTIALITY:

Efforts will be made to keep your personal information confidential. Your identity will be held in confidence in reports in which the study may be published and databases in which results may be stored.

Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the study investigator and his/her research associates, the Indiana University Institutional Review Board or its designees, and (as allowed by law) state or federal agencies, specifically the Office for Human Research Protections (OHRP).

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VOLUNTARY NATURE OF STUDY

Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time. Leaving the study will not result in any penalty or loss of benefits to which you are entitled. Your decision whether or not to participate in this study will not affect your current or future relations with your department or Indiana University.

Student Background Form

Student Background Form[46]
Participant _____(#)

1. How old are you? _____

2. Do you identify as:
   a. Male
   b. Female
   c. Other

3. How do you usually describe yourself?
   a. White or Caucasian
   b. Black or African American
   c. Hispanic or Latino/a
   d. Asian or Asian American
   e. American Indian or Alaskan Native
   f. Native Hawaiian or Pacific Islander
   g. Other (please specify)

4. What is your current marital status?
   a. Married
   b. Divorced
   c. Widowed
   d. Separated
   e. Single, Never Married

5. Are you an international student (i.e., your permanent residence is in a country other than the United States)?
   a. Yes
   b. No

6. From what IU department will you receive your degree?

   _____

7. In what year did you enroll in your current graduate degree program? _____

[46] Where possible, questions on the student background form are consistent with the GSSC survey.

CURRICULUM VITAE

Rachel La Touche
June 2017

Office Address:
Department of Sociology – University of Toronto
725 Spadina Avenue, Rm. 270
Toronto, ON M5S 2J4
Email: rlatouch@indiana.edu

EDUCATION

June 2017 **Ph.D., Sociology**
Indiana University – Bloomington
Dissertation: Graduate Students' Mental Health: Departmental Contexts as a Source of Differential Risk
Committee: Jane D. McLeod (Chair), Peggy A. Thoits, Pamela Braboy Jackson, Bernice A. Pescosolido
Minor: Research Methods

2012 **Ph.D. Qualifying Examination**: *Social Stratification*
Committee: Art Alderson (Chair), Patricia McManus, and Pamela Walters

2009 **Master of Arts, Sociology**
State University of New York at Buffalo
Thesis: Abortion and Crime Rates: The Canadian Case
Committee: Robert Wagmiller Jr. (Chair), Robert Adelman

Graduate Certificate, Canadian Studies
State University of New York at Buffalo (Buffalo, New York)

2006 **Bachelor of Arts (Honors), Sociology**
Queen's University
Thesis: Swimming Upstream: Streaming and Disenfranchised Groups in Canadian Secondary Schools

TEACHING AND RESEARCH INTERESTS

Social Inequality	Scholarship of Teaching and Learning	Mental Health
Gender	Qualitative/Quantitative Methodology	Race/Ethnicity

TEACHING EXPERIENCE

2016 – 2017 **Assistant Professor, University of Toronto**
Department of Sociology
Gender and Society (1 semester, 121 students)
Logic of Social Inquiry (1 semester, 82 students)
Global Inequality (1 semester, 110 students)
Introduction to Sociology: Social Inequalities (1 semester, 663 students)

2015 – 2016 **Associate Instructor, Indiana University**
Department of Sociology
Social Inequality (1 semester)
(Fall 2015, 50 students)

2014 – 2015 **Associate Instructor, Indiana University**
Department of Sociology
Sociology of Mental Illness (1 semester)
(Summer II, 21 students)

Associate Instructor, Indiana University
Department of Communication and Culture
Public Oral Communication (2 semesters)
(Fall 2014, 43 students; Spring 2015, 42 students)

2011 – 2014 **Associate Instructor, Indiana University**
Department of Sociology
Charts, Graphs and Tables (4 semesters)
(Fall 2011, 65 students; Spring 2012, 71 students; Fall 2012, 70 students; Fall 2013, 62 students)

Associate Instructor, Indiana University
Department of Sociology
Research Methods (3 semesters)
(Summer 2012, 7 students; Spring 2014, 36 students; Summer 2014, 5 students)

Spring 2013 **Visiting Instructor, Universität Mannheim, Germany**
Department of Sociology
Global Inequality and Cross-Comparative Methods (1 semester)
(Spring 2013, 16 students)

Summer 2011 & 2012 **Teaching Assistant, University of Michigan, Ann Arbor**
Interuniversity Consortium for Political and Social Research (ICPSR)

Methodological Issues in Quantitative Research on Race and Ethnicity (2 semesters)

- Assisted instructor in an intensive 4-week graduate course of 30-45 students by leading computer lab sessions, creating and grading assignments, and holding office hours.

2009-2010 **Lab Associate Instructor, Indiana University**
Department of Sociology
Statistics for Sociology (1 semester)
(Fall 2010, 11 students)

Graduate Assistant, Indiana University
Department of Sociology
Introduction to Sociology (1 semester)
(Spring 2010, 150 students)

Graduate Assistant, Indiana University
Department of Sociology
Social Inequality (1 semester)
(Fall 2009, 70 students)

AWARDS

2016 **Lieber Memorial Teaching Associate Award**

- Most prestigious award to recognize outstanding teachers among graduate students at Indiana University

2015 **Edwin H. Sutherland Award for Excellence and Commitment to Teaching**
Department of Sociology

- Most prestigious departmental award to recognize excellence in teaching.

2012 **Social Action Award**
Department of Sociology, Indiana University

- Departmental award to recognize excellence in service, teaching and research that brings about constructive change in the community and society-at-large.

2011 **Collaboration and Inclusion Award: Honorable Mention**
Indiana University Student Organization Awards Committee
Mental Health Working Group (MHWG)

- Award presented to a student organization that collaborates to develop a program, event, or initiative that benefits the campus and/or community.

2010 **Clifford C. Clogg Memorial Award**

American Sociological Association and ICPSR

- Monetary award for tuition and living expenses incurred attending summer statistics program at the Inter-University Consortium for Political and Social Research (ICPSR) in Ann Arbor, Michigan.

PEER-REVIEWED PUBLICATIONS

2014 Grady, Rebecca K., **Rachel La Touche**, Jamie Oslawksi-Lopez, Alyssa Powers, and Kristina Simacek. "Betwixt and Between: Mental Health Experiences of Graduate Students in Conflicting and Marginal Roles" – *Teaching Sociology* 42(1): 5-16.

MANUSCRIPTS IN PROGRESS

La Touche, Rachel, Rebecca K. Grady, Jamie Oslawksi-Lopez, Alyssa Powers, and Kristina Simacek. "Mental Health Resource Utilization Among Graduate Students."

Grady, Rebecca K., **Rachel La Touche**, Jamie Oslawksi-Lopez, Alyssa Powers, and Kristina Simacek. "Coping with Stress in Graduate School."

OTHER PUBLICATIONS

2015 The Badass Sociologist: Teaching Social Problems Division Newsletter
Society for the Study of Social Problems (SSSP)
Using OkCupid to Teach Methods
La Touche, Rachel

2014 IUB Graduate and Professional Student Mental Health and Health Services Use: Report to the University Graduate School
Mental Health Working Group
Grady, Rebecca K., **Rachel La Touche**, Jamie Oslawksi-Lopez, Alyssa Powers, Will McConnell, and Emma Cohen

2011 Majority Report – Indiana University
Leading Others Beyond the Pains of Stress
La Touche, Rachel

PROFESSIONAL DEVELOPMENT

2015 **American Sociological Association Teaching and Learning Preconference Workshop**
Active Learning Strategies for Classes Large and Small

Surviving and Thriving:

Minority Graduate Student Professionalization Series
Indiana University – Bloomington

Intersections of Identity and Instruction Graduate Student Learning Community (I3 GSLC)
Indiana University – Bloomington

2013 – 2014 **Preparing Future Faculty Planning Committee**
Professional Pathways: Preparing for Your Academic Future
Panel Session Organizer: Doctorate(s) Without Borders
Indiana University – Bloomington

Preparing Future Faculty Shadowing Fellowship
Department of Sociology and Anthropology: Hanover College, Indiana

- Participated in faculty workshops, faculty meetings, meetings with prospective graduate students, delivered guest lecture and shadowed Professor Katy Hadley.

Scholarship of Teaching and Learning (SOTL) Presentation
Expert Insider Prose: Teaching Disciplinary Arguments and Information Fluency Across the Curriculum
Indiana University – Bloomington

2013 **American Sociological Association Teaching and Learning Preconference Workshop**
Universal Design: Interrogating Inequality in Learning

2012 **Center for Innovative Teaching and Learning (CITL) Workshop**
Statements of Philosophy – Critical Reflection about Teaching Practice
Indiana University – Bloomington

Center for Innovative Teaching and Learning (CITL) Workshop
Teaching Portfolios – Documenting and Reflecting on Teaching Practice
Indiana University – Bloomington

Interdisciplinary Didactic Seminar (IIDS)
Dissertation Funding Workshop

Indiana Interdisciplinary Didactic Seminar (IIDS)
Automation and Workflow in STATA

Preparing Future Faculty Planning Committee
Not a Zero Sum Game: Moving Forward with Research, Service and Teaching
Indiana University – Bloomington

2011 **Preparing Future Faculty Planning Committee**

Becoming an Academic – Challenges and Opportunities
Indiana University – Bloomington

2010 **Indiana Interdisciplinary Didactic Seminar (IIDS)**
Group Comparisons with Quantitative Methods: Using Race as a Case

Inter-University Consortium for Political and Social Research
Courses: Introduction to Bayesian Methods, Methodological Issues in Quantitative Research in Race and Ethnicity, Introduction to R

2009 **National Longitudinal Study (NLS) Workshop**
Ohio State University
Columbus, Ohio July 13-15

PRESENTATIONS AND ACADEMIC CONFERENCES

2017 **La Touche, Rachel**
Presider – Eastern Sociological Society (ESS) Conference Panel
Sociology of Teaching and Teaching Sociology
Philadelphia, PA

2016 **La Touche, Rachel**
My Day Job: Politics and Pedagogy in Academia
Eastern Sociological Society Annual Conference (ESS)

La Touche, Rachel, Katherine Kearns, Aisha Burton, Leslie Drane, and Martin Law
Unique Experiences of Diverse Graduate Instructors: When Diversity in the Classroom is You
E.C. Moore Symposium on Excellence in Teaching
IUPUI Center for Teaching and Learning

2015 Grady, Rebecca K., **Rachel La Touche**, Jamie Oslawksi-Lopez, Alyssa Powers, and Kristina Simacek
Mental Health Resource Utilization Among Graduate Students
American Sociological Association (ASA)

2014 Grady, Rebecca K., **Rachel La Touche**, Jamie Oslawksi-Lopez, Alyssa Powers, and Kristina Simacek
Coping with Stress in Graduate School
Society for the Study of Social Problems (SSSP)

Grady, Rebecca K., **Rachel La Touche**, Jamie Oslawksi-Lopez, Alyssa Powers, and Kristina Simacek
Coping with Stress in Graduate School: Utilizing Resources
North Central Sociological Association (NCSA)

2013 Grady, Rebecca K., **Rachel La Touche**, Jamie Oslawksi-Lopez, Alyssa Powers, and Kristina Simacek
Betwixt and Between: The Social Position and Stress Experiences of Graduate Students
Society for the Study of Social Problems (SSSP)

2008 **La Touche, Rachel**
Understanding Children's Literacy: The Influence of Parenting Style
New York State Sociological Association Annual Conference

CONFERENCE TRAVEL SUPPORT

2015 **Indiana University Department of Sociology Conference Travel Support**

- Travel award to cover expenses associated with attending the American Sociological Association (ASA) annual conference and the Society for the Study of Social Problems (SSSP) annual conference, August 2015.

SAGE Teaching Innovations & Professional Development Award
Section on Teaching and Learning, American Sociological Association

- Travel award to cover expenses associated with attending the Section on Teaching and Learning's Pre-Conference Workshop at the annual meeting of the American Sociological Association, August 2015.

2014 **Lee Student Support Fund (Declined)**
Committee of the Society for the Study of Social Problems (SSSP)

- Monetary award for Travel to SSSP Annual Conference

2013 **Lee Student Support Fund**
Committee of the Society for the Study of Social Problems (SSSP)

- Monetary award for Travel to SSSP Annual Conference

RESEARCH EXPERIENCE

Spring 2012 – Present **Research Member, Mental Health Working Group (MHWG)**
Graduate Student Stress and Coping Survey - Indiana University

- Constructed, coordinated and implemented graduate mental health survey questionnaire alongside fellow MHWG members. Processed and analyzed survey data (GSSC), summarizing results for university-wide report.

Graduate Student Stress Focus Group Study – Indiana University

- Constructed, coordinated and implemented focus group sessions alongside fellow MHWG members. Processed and analyzed qualitative data, and summarizing results for academic publication.

Fall – Spring 2011 **Research Analyst, Indiana University**
Office of Enrollment Planning and Research

- Extracted, processed, managed, and conducted multivariate statistical analysis on data related to undergraduate enrollment, retention and financial support.

Spring 2011 **Research Assistant, Indiana University**
Department of Sociology
PI: Dr. Jennifer Lee

- Collected and compiled literature, and created annotated bibliographies.

RESEARCH GRANTS AND FELLOWSHIPS

2014 **Service-Learning Program Graduate Fellowship**
Center for Innovative Teaching and Learning (CITL)

- Fellowship and stipend to defray the cost of developing a service-learning course

2013 – 2014 **Preparing Future Faculty Shadowing Fellowship**
Department of Sociology and Anthropology: Hanover College, Indiana

- Fellowship granted for graduate students to shadow faculty at a liberal arts institution.

2013 **Baden-Württemberg-Stipendium**
Universität Mannheim, Germany

- Fellowship and stipend to cover travel and living expenses associated with teaching appointment at the University of Mannheim in Mannheim, Germany.

2011 **University Graduate School – Research Grant**

- Grant funds for Mental Health Working Group (MHWG) focus group and survey research

2010 **Karl F. Schuessler Scholarship for Study at ICPSR**
Department of Sociology, Indiana University

- Monetary award for tuition and living expenses incurred attending summer statistics program at the Inter-University Consortium for Political and Social Research (ICPSR) in Ann Arbor, Michigan.

SERVICE

2016 – 2017 **Faculty Contributor**
Demystifying Dissertation Writing: Advanced Students Discuss the Writing Process
University of Toronto

Faculty Contributor
CV Workshop: The CV as a Document and Motivational Force
University of Toronto

Faculty Contributor
First in the Family Peer Mentorship Program – Meet the Profs
University of Toronto

Book Review
Nelson Education – *Sociology in Our Times 7e*

Online Teaching Platform Review
Nelson Education – *Connecting Sociology*

2015 **Invited Speaker**
Graduate Recruitment Roundtable
Department of Sociology
Indiana University – Bloomington

- Invited to speak on graduate student recruitment panel about teaching, the Preparing Future Faculty program, and making timely progress through the graduate program.

Invited Speaker
A Roundtable Discussion on Teaching Development Issues for Diverse Associate Instructors
Center for Innovative Teaching and Learning

2013 – 2014 **Undergraduate Mentor**
Indiana University - Bloomington

- Assisted undergraduate honors student with thesis research and preparing regional conference presentation.

2012 – 2013 **Executive Committee**
Indiana University - Bloomington

2012, Fall 2013, Fall 2014 **Graduate Tutor**
Centre for Innovative Teaching and Learning (CITL)
Writing Tutorial Services

Spring 2011 – Present **Chair**
Graduate Student Mental Health Working Group
Indiana University - Bloomington

Fall 2010 – Spring 2014 **Graduate Student Mentor**
Department of Sociology
Indiana University - Bloomington

Fall 2010, Fall 2011 **Proseminar Organizer**
Surviving and Thriving in Graduate School
Stress, Strategies and Mental Health Resources at IU
Department of Sociology
Indiana University – Bloomington

Fall 2010 – Spring 2011 **Co-Chair**
Race and Ethnic Relations Committee
Department of Sociology
Indiana University - Bloomington

Member
GSA Fundraising Committee
Department of Sociology
Indiana University – Bloomington

Fall 2009 – Spring 2010 **Member**
Mentor Award Committee
Department of Sociology
Indiana University – Bloomington

PROFESSIONAL MEMBERSHIPS AND ASSOCIATIONS

The International Society for the Scholarship of Teaching and Learning (ISSOTL)

American Sociological Association (ASA)

- Sociology of Mental Health (Section Membership)
- Teaching and Learning (Section Membership)

Society for the Study of Social Problems (SSSP)

- Society and Mental Health (Section Membership)
- Teaching Social Problems (Section Membership)

Eastern Sociological Association (ESS)