Graduate Student Mental Health:

Lessons from American Economics Departments*

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Abstract

We study the mental health of graduate students at economics PhD programs in the US. Using clinically validated surveys, we find that 18% of graduate students experience moderate or severe symptoms of depression and anxiety - more than three times the population average - and 11% report suicidal ideation in a two-week period. The average PhD student reports greater feelings of loneliness than does the average retired American. Only 26% of economics students report feeling that their work is useful always or most of the time, compared with 70% of economics faculty and 63% of the working age population. Depression and symptoms of anxiety increase with time in the program: 25% of students in years 5+ of their programs experience moderate or severe symptoms of depression or anxiety compared with 12-14.5% of first-year students. Many students with significant symptoms of mental distress are not in treatment. We provide recommendations for students, faculty, and administrators on ways to improve graduate student mental health.

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1 Introduction

Recent suicides among graduate students and faculty in economics have raised questions and concerns about mental health in the profession. In response, we developed a study of graduate student mental health with the aim of addressing these questions and concerns with data. The results we present here contribute to a literature in education and psychiatry by being the first to document the prevalence and severity of graduate student mental health problems in economics departments. This work is, consequently, the first systematic study of the mental health of economists.

How common and how severe are symptoms of depression, anxiety, and suicidal ideation among aspiring economists? Is there something about the economics PhD environment that contributes to these symptoms? If so, what can we do about it?

To answer these questions, we developed three survey instruments: (1) an initial student survey about 25 minutes in length that covered mental health, experiences in the PhD program, and personal background information; (2) a 10-minute follow-up student survey that covered mental health and experiences in the program; and (3) a 10-minute survey of faculty in each participating department that covered experiences with students, reflections on the work environment, and recommendations on how to help students struggling with mental health issues. We administered the initial student survey and the faculty survey in the Fall of 2017, with the student follow-up survey administered in the Spring of 2018. The follow-up survey allowed us to use survey-taking attrition to gain insight into the representativeness and persistence of our initial results, and to see whether our results were robust to seasonal differences.

With support from members of the American Economic Association's (AEA) Executive Committee, we contacted Department Chairs and Deans of Graduate Studies at 15 departments in an effort to recruit programs to participate. Our objective was to obtain buy-in from departmental leadership into the importance of the study, including a commitment to encourage student and faculty participation and to take our findings seriously. The downside of this approach was a sample that in the end included only 8 top-ranking departments and

thus a lens into only a particular segment of the entire economics graduate student population. The upside, we believe, was a high response rate from students and faculty. Fruitful future work could expand our study to other departments and other countries, exploring differences and similarities with the findings we report here.

1,136 economics PhD students received our first survey via e-mail and 513 of them (45%) participated (Table 1).[1] Concurrently with the first student survey, Department Chairs sent the short faculty survey to approximately 448 faculty members, of whom 187 (42%) participated. We did not provide participation incentives for any of the surveys. The final list of participating institutions included: Columbia University, Harvard University, University of Michigan, Massachusetts Institute of Technology (MIT), Princeton University, UC Berkeley, UC San Diego, and Yale University.

Our results echo some of the recurring findings in the education and psychiatry literature that indicate a significant increase in the prevalence of emotional distress among university students over the last few decades (e.g., Hysenbegasi et al. (2005), Hyun et al. (2006), Eisenberg et al. (2007), Garlow et al. (2008), Hunt and Eisenberg (2010), Eisenberg et al. (2013), Lipson et al. (2016), Lipson et al. (2018), Duffy et al. (2019)). Like us, other researchers have administered surveys to measure the prevalence and severity of student mental health problems. Many of these studies focus either only on undergraduates or on a sample that combines undergraduate and graduate student populations.

More recent studies that have focused solely on graduate students suggest that these students may experience mental health problems at a higher rate than undergraduates (e.g., Graduate-Assembly (2014), Garcia-Williams et al. (2014), Rummell (2015), UCOP (2017), Levecque et al. (2017), Evans et al. (2018), Twenge et al. (2019)). Fear of failure, perseveration on setbacks and struggles, self-consciousness, fears of judgment, conflicted advising relationships, financial concerns, and general anxiety are the most common sources of stress highlighted by existing research on graduate student mental health.

[1] In an earlier draft, we wrote that 1,185 students were contacted, for a response rate of 43%. We did in fact email 1,185 students, but only 1,136 of them were actually enrolled in their PhD program at the time. Some of the email addresses we received from departments were of students who remained on the department mailing list even though they were no longer enrolled. We were explicit in our e-mails and consent form that only currently enrolled students should take the surveys.

We find that the prevalence of poor mental health in economics PhD programs is substantial, even when we take potential selection concerns into account. 18% of graduate students are experiencing moderate to severe symptoms of depression and anxiety, as measured by the clinically-validated PHQ-9 and GAD-7 scales. These rates are 2 to 3 times the national prevalence, but are in the ballpark of the estimates produced by other studies of graduate student mental health that use clinically validated screens. Although 90% of students with moderate or severe symptoms of depression or anxiety would be expected to have a diagnosable clinical disease, only 19-21% of these students are currently in treatment for depression or anxiety. Suicidal ideation is 1.5 times more prevalent among economics PhD students than among young adults between the ages of 18 and 25, the highest-risk group in the general population. Other strong correlates of depression and anxiety symptoms, like loneliness, are also more prevalent among economics PhD students.

We observe the prevalence of moderate to severe symptoms of depression and anxiety increasing over the course of the program. 14.5% of first-year students experience such symptoms, compared with 25% of those who are in years 5+ in their program. Similarly, 7% of the first-year students report suicidal ideation in a 2-week period, compared to 13% of those in years 5+. While 13% of surveyed students reported being diagnosed with a mental health issue by a professional before starting their PhD program, an additional 12% reported being diagnosed over the course of the program. These findings suggest that graduate student mental health changes during the course of the program and that our results capture more than just a possible disproportionate selection of individuals with poor mental health into economics PhD programs.

Many students struggle with finding meaning in their work. Only 26% report feeling that their work is useful always or most of the time, compared to 70% of economics faculty and 63% of the entire working age population. Only 19% of students feel that they have opportunities to make a positive impact on their community or society, compared to 58% of faculty and 53% of the working age population. We find that the intensity of such experiences is negatively correlated with mental health, providing us with more suggestive, if still speculative, evidence

that aspects of the graduate program experience affect student mental health.

While the number of times a student meets with his or her advisers is not correlated with mental health outcomes, a student's ability to be honest with those advisers, feeling that the advisers care about the student's research, and feeling that advisers care about the student as a person are associated with better mental health. While few students say they can talk to their advisers about mental health issues, few students say they *want* to talk about these issues with advisers. The topics that students want to discuss openly with advisers but cannot are for the most part professional: non-academic career options, preparing for the job market, and research progress top the list.

There is also a general lack of ways to effectively address advising issues. When a problem with advising arises, only 42% of students say they know where to turn for help and only 36% say they are moderately or very likely to do so. This is in contrast to issues with mental health: 87% of students say they would know where to turn for help if facing a mental health issue and 55% say they would be moderately or very likely to do so. Such results lead us to believe that a key challenge for departments is to improve the quality of communication between faculty and students and to create clear, safe channels through which advising issues can be resolved.

Overall, our work points to the importance of improving collegiality, encouraging collaboration, helping students find meaning in their work, and lowering barriers to high quality mental health care as the keys to improving graduate student mental health. Doing these things as early in the program as possible should help students build resiliency for the later years of the program.

The next section discusses the clinical screens we use in our study and compares our sample of respondents to the population of economics PhD students at the participating programs. Section 3 presents our findings and section 4 discusses potential connections between graduate student mental health and work experiences. Section 5 concludes with specific recommendations for how to make progress on the issues we identify. The Appendix provides advice offered by faculty and includes copies of the survey instruments themselves.

2 Methodology

2.1 Screening Tools

Our study utilized several standardized screens in the mental health literature to assess the symptoms of common mental health disorders in our study population. To examine depressive symptoms, we utilized the PHQ-9 survey instrument. The PHQ-9 has nine questions related to core symptoms of Major Depressive Disorder, assessing mood, sleep, interest, guilt, energy, concentration, attention, psychomotor slowing, and suicidality. The nine symptoms assessed are classic clinical features of Major Depressive Disorder, a diagnosis that can only be made by a licensed clinician (APA, 2013).

In the PHQ-9, respondents are asked to report how often they experienced the following symptoms over the previous two weeks, with four available answer choices to assess both presence and severity of the symptom: not at all (0 points), several days (1 point), more than half the days (2 points), or nearly every day (3 points). Hence, the allowable range of scores is 0 (no presence of any symptom) to 27 (full severity of each of the 9 symptoms). With a cutoff threshold of greater than or equal to 10, the PHQ-9 has an 88% sensitivity and an 88% specificity for the diagnosis of Major Depressive Disorder (Kroenke and Spitzer, 2002). Sensitivity tells us the probability of testing positive for depression (PHQ-9 $\geq$ 10) when the disease is present, while specificity shows the probability of testing negative (PHQ-9 $<$ 10) for depression when the disease is absent.

The PHQ-9 is widely used not only as a tool for epidemiological measurement, but also for clinical screening in physicians' offices and hospitals (Kocalevent et al., 2013). Since diagnosis of Major Depressive Disorder must involve an interview with a licensed clinician, we are able to gather information on the prevalence of symptoms of depressive disorders, not to report the measured prevalence of the disorder itself. As noted above, the PHQ-9 relies on the self-report of symptoms. Although many active efforts are underway to identify biomarkers of depressive disorders, self-description of symptoms remains the core feature of the American Psychiatric Association's diagnostic criteria of Major Depressive Disorder (APA, 2013).

Other instruments commonly used to measure depressive symptoms include the Beck Depression Inventory II (BDI-II), the Hamilton Depression Rating Scale (HAM-D), and the Center for Epidemiologic Studies Depression Scale (CES-D). Numerous studies comparing these instruments have found high internal consistency between the measures (e.g., Schwenk et al. (2010), Kung et al. (2013), Choi et al. (2014)). We chose to use the PHQ-9 in our study because it is short, free, widely used, and has a high sensitivity and specificity. A number of other studies of graduate student and professional student mental health have also utilized the PHQ-9, allowing us to directly compare out results to other settings in higher education (e.g., Garcia-Williams et al. (2014), Evans et al. (2018)). Instrument internal consistency, however, also allows us to make comparisons across studies that use these other instruments (e.g., UCOP (2017)).

Our assessment of symptoms of anxiety proceeded similarly, using the GAD-7 survey instrument. The GAD-7 assesses the severity of common symptoms of anxiety, including feeling nervous, not being able to control worrying, and feeling afraid as if something awful might happen. The scoring system resembles the PHQ-9: points are assessed from 0 to 3 for each symptom, depending on its reported presence and severity over the past two weeks. Using a cutoff threshold of greater than or equal to 10, the GAD-7 has a sensitivity of 89% and specificity of 82% for the diagnosis of Generalized Anxiety Disorder (Spitzer et al., 2006). As with depression, a clinician is required for the diagnosis of this disorder; our results here indicate the prevalence of symptoms of anxiety, not of the disorder itself. The GAD-7 is widely used for epidemiological estimation and as a clinical screening tool for Generalized Anxiety Disorder (Stein and Sareen (2015), Plummer et al. (2016)).

We assessed the presence of suicidal ideation through responses to the final question of the PHQ-9, which asks "over the last two weeks, how often have you been bothered by thoughts that you would be better off dead, or hurting yourself in some way?" Suicidal ideation measured through this question has been demonstrated to be a predictor of suicidal behavior and completed suicide (Rossom et al. (2017)). For robustness in measuring risk for a low probability event, we used an additional screen for suicidal ideation in our survey instrument, the

SBQR, which assesses the presence of self-reported suicidal ideation in the previous one-year time period (Osman et al., 2001). The final question of the PHQ-9 is used as an indicator of suicidality in the epidemiologic literature as well as a clinical assessment tool in behavioral health offices (Arenson et al., 2018).

We also assess loneliness, which is not a psychiatric disorder but a psychological state that is closely related to several common mental health disorders (Mushtaq et al., 2014). We measured loneliness through a validated, 3-question version of the UCLA Loneliness Scale, a tool utilized by the vast majority of studies on loneliness (Russell et al. (1980), Oshagan and Allen (1992), and Hughes et al. (2004)). Additional questions borrowed from other instruments, including the RAND American Working Conditions Survey and *Nature*'s 2017 survey of graduate student work experiences, are discussed in-depth throughout section 3.

2.2 Sample Characteristics

The sample of students who participated in our study is comparable along several dimensions to the population of students in the 8 economics PhD programs. 28.4% of the students enrolled in these programs in the 2017-2018 academic year were women. By comparison, 34.7% of the participants in our study were women, making them more represented in our sample (Table 2). Given that the prevalence of mental health issues is higher among women than men (in our study as in the general population), this could be biasing our prevalence rates upwards. In the administrative data, the share of international students and US students is basically even, with US students making up 50.8% of the population.[2] Of those who took our survey, 53.5% were US students, suggesting that our sample is just slightly over-representing US students. Since US students report a slightly higher prevalence of depression and anxiety symptoms than international students in our sample, this is likely also slightly biasing those reported prevalence rates upwards.

We do not, however, expect these biases to be substantial and have other reasons to believe that our sample is representative. One major reason why we did a follow-up survey of the students in the Spring of 2018 was to see whether the attrition could tell us something about

[2]International students, as defined by the programs, are those who received their Bachelor's degree from a non-US institution. That is the definition of international students we use throughout the paper as well.

the representativeness of our sample. For example, if the students who took both the Fall 2017 and the Spring 2018 surveys generally had better mental health results in the Fall 2017 survey than those students who attrited and did not take the Spring 2018 follow-up, we would have suggestive evidence that those with worse mental health are less likely to engage with this type of survey. We would have suggestive evidence that sample selection, viewed from this angle, is biasing our prevalence rates downward.

Performing this kind of check, we do not find evidence that the attriting sample of students is different from the sample of students who continuously engage with our study. There is no significant correlation between a student's mental health scores in the Fall 2017 survey and that student's probability of also taking the Spring 2018 survey.[3] Put differently, our prevalence rates would remain virtually unchanged if we study our full sample (513 students) or if we study only those students who disengage after taking the first survey (263 students). Moreover, the prevalence rates and key correlations from the Spring 2018 survey are very similar to those we measure in the Fall 2017 survey. These findings reassure us that our results are stable, representative, and not driven by seasonal variation in mental health.

We might also be worried about selection issues within our sample, across gender, ethnicity, nationality, years in the program, etc. For example, if students with better mental health in later years in the program are less likely to take our survey, our result that mental health worsens with time in the program could be driven by selection (Tables 3-5). We do indeed see a negative correlation between the response rate in a given year in the program and different prevalence rates in that year, so we cannot rule out that our result is at least in part affected by selection.[4] These correlations, however, are skewed by the highest response rate in year 2 (55%) and fairly low symptom prevalence there, and the lowest response rate in year 6+ (36%) and high symptom prevalence in that year. If we look only at years 1, 3, 4, and 5, where response rates are more similar (between 43% and 48%), we can see that the prevalence

[3]The correlation between Fall 2017 PHQ-9 score and the probability of taking a follow-up survey is 0.006 with a p-value of 0.89. The correlations and levels of statistical significance are similar for other mental health measures.

[4]The correlations are statistically significant for the PHQ-9 suicidality question (correlation of -0.89) at the 5% level and for GAD-7 (correlation of -0.76) at the 10% level, but are not significant for PHQ-9 (correlation of -0.39) or for SBQR (correlation of -0.36).

of serious depression and anxiety symptoms still increases with year in the program.

Other data characteristics also give us confidence that our results are not mainly reflecting selection. For example, the ratio of female and US student respondents stays fairly constant across years in the program (Table 2).[5] Additionally, as we discuss in the next section, the share of students who come in to their program with a diagnosis of mental illness (13%) is about half the share of students who currently have a diagnosis (25%), suggesting that for many students illnesses develop with time spent in the program. These diagnoses could, of course, be a result of a multitude of factors, but given the dominant role that graduate school plays in student lives, we believe that these new diagnoses are not independent of graduate school experiences. Further research that tracks students and their mental health throughout the PhD program will have the potential to shed more definitive light on whether mental health does in fact worsen as a result of time spent in the program.

For more extensive demographic characteristics for our sample, please see Table B.1 in the Appendix.[6]

3 Results

3.1 Mental Health

Our clinical screens show a high prevalence of moderate to severe symptoms of depression and anxiety among economics PhD students. About 18% of students score in the moderate to severe symptom zone and would likely be diagnosed with depression or anxiety disorder upon seeing a mental health professional (Table 6). 11% of economics students (56 people) report having suicidal thoughts on at least several days within a two week period (last question of the PHQ-9) and 12% were deemed at increased risk for suicide by a survey instrument with a one-year look back (SBQR). With a few exceptions, the prevalence of these issues is generally

[5] Also reassuring, Table B.1 shows that the percentage of respondents who are female is similar for US students (34.9%) and international students (34.6%).

[6] Some notable facts revealed by our background questions in Table B.1: International students are considerably more likely to be the first in their family to graduate from college: 14.4% of international students have a father with a high school degree or less, compared to 4.1% of US students. Overall, almost 60% of students in the participating programs have a father with some kind of graduate degree. International students are also considerably more likely than US students to be working while in the PhD program (80.8% vs. 71.6%), to be living alone (32.2% vs. 24.1%), and to have done something else between their undergraduate degree and the PhD program (81.9% vs. 70.3%).

higher for female than male students: Female students are 1.1 (depression) to 1.2 (anxiety) times more likely than male students to be experiencing the symptoms we focus on. US students have a slightly higher prevalence than international students of depression (19.2% vs. 15.5%) and anxiety (17.9% vs. 16.9%) symptoms. Notably, however, international students are 1.4 times more likely to have suicidal ideation than US students (13.1% vs. 9.3%).

For comparison, 8.1% of the general US population and 7.7% of Americans between the ages of 20 and 39 are experiencing moderate to severe symptoms of depression (CDC (2018)). In contrast to our numbers, women in the general population are about twice as likely as men to be experiencing these symptoms (10.4% vs. 5.5%), though our overall prevalence rate for women (18.3%) is still substantially higher.

In a small sample survey of doctoral students at Emory University (301 students or 8% responded to the survey), Garcia-Williams et al. (2014) find 34.5% with PHQ-9 scores greater than or equal to 10. Evans et al. (2018) employ convenience sampling via email and social media of PhD students around the world. Using the PHQ-9, the paper finds 39% of the 2,279 respondents with moderate to severe symptoms of depression.[7] In a 2016 well-being survey of graduate students across all ten campuses, the University of California used the CESD-R measure of depression and recorded 35% of survey respondents self-reporting symptoms that met the clinical cutoff for Major Depressive Disorder. The survey was administered to a stratified random sample of 13,400 students and had a 40% response rate (UCOP (2017)). The prevalence rate of depressive symptoms that we see among economics PhD students is thus about half of the rates captured by previous studies of graduate students writ large.

Our prevalence rate for anxiety is also substantially higher than in the general population and lower than earlier studies have measured among graduate students. Studies of the US population over the last 25 years suggest an adult prevalence rate of 6% or less (Wittchen et al. (1994), Kessler et al. (2005), Spitzer et al. (2006)) and a worldwide 2017 World Health Organization study put the highest regional rate of anxiety disorder at 5.8% in the Americas (WHO (2017)). Using the GAD-7 in their convenience sample survey of graduate students around the world, Evans et al. (2018) recorded 39% with moderate or severe symptoms of

[7] The authors do not provide a response rate.

anxiety.

Suicidal ideation is 3 times more likely among economics PhD students than among adults in the general population (3.9%) and 1.5 times more likely than among the highest risk group, adults aged 18-25 (7.4%) (CDC (2015)). A 2010-2012 study of almost 300,000 adult outpatients treated for mental health conditions found that, among these patients, 20% reported suicidal ideation through the last question on the PHQ-9 screen (Rossom et al. (2017)). The prevalence of suicidal ideation among economics PhD students in our sample, at 11.3%, is thus in between the rates found for these two groups.

A quarter of economics students report being diagnosed by a professional with a mental illness, 13% prior to starting their PhD program and another 12% after starting their program. While perhaps slightly elevated, these numbers are comparable to those found in the general population. The 2017 National Survey on Drug Use and Health administered by the US Department of Health and Human Services found that 18.9% of US adults were living with some form of mental illness (Bose et al. (2018)). The highest prevalence, of 25.8%, was found among adults aged 18-25, with adults aged 26-49 following closely behind at 22.2%.[8] It thus does not appear that those who choose to enter into economics PhD programs are more likely to have a diagnosed mental illness than adults in a similar age group nationwide. It could, however, still be the case that economics PhD students are less likely than other adults to seek professional help when experiencing symptoms and are therefore less likely to receive a formal diagnosis.

Our study also included commonly-used surveys of various experiences and feelings, many of which are correlated with the clinically validated screens for depression, anxiety, and suicidality (Table B.2). Loneliness and isolation appears to be an issue among economics PhD students, with the average student finding himself or herself considerably lonelier than the average retired American. The mean economics PhD score on the UCLA 3-item loneliness scale was 5.2, with a standard deviation of 1.8. For a sample of over 2,000 retired Americans in 2002, that score was 3.9, with a standard deviation of 1.3 (Hughes et al. (2004)).[9]

[8]Note that have a diagnosed mental illness is different from experiencing moderate or severe symptoms of that illness. Diagnosis and proper treatment can reduce symptom severity.

[9]The 2002 Health and Retirement Study (HRS) surveyed individuals with a mean age of 66.5 (SD=10.2).

A 2018 study by the Kaiser Foundation and The Economist found that loneliness and isolation are widely experienced in the US (DiJulio et al. (2018)). Although we use different scales, our results suggest that more economics PhD students experience loneliness and isolation than a representative sample of Americans. 16.2% of economics PhD students say they often experience feeling isolated from others, compared to 11% of Americans reporting that they experience this feeling often or always. 17.5% of economics PhD students say they often feel that they lack companionship, compared to 13% nationwide reporting that they feel this way often or always.

Feelings of not being good enough or being an impostor are pronounced in our sample as well. 61% of students experience frequent or intense impostor syndrome symptoms and 23% of students agree or strongly agree with the statement "I feel I do not have much to be proud of." 41% of students feel overwhelmed by work most of the time. Consistent with DiJulio et al. (2018) and with Hughes et al. (2004), we find these feelings to be highly correlated with other symptoms of poor mental health.

Although our findings suggest a substantial prevalence of various serious mental health issues, few students are receiving clinical treatment for these issues. 15.1% of students are currently in treatment for some mental health issue (9.6% are in treatment for anxiety and 7.5% are in treatment for depression, non-exclusively). Zooming in on those with moderate to severe mental health issues, the share receiving treatment is higher but still low. Of those with moderate to severe symptoms of depression, only 19.1% are receiving treatment for depression. 21.1% of those with moderate to severe symptoms of anxiety are receiving treatment for anxiety. Of those who have contemplated suicide, only 27% are currently receiving some form of treatment (Table 7). In contrast, a national survey of individuals in the labor market has previously raised concerns that only half of those who experienced serious symptoms of depression were receiving treatment (Kessler et al. (2008)).

Other responses point to students facing barriers to using mental health services. 87%, for example, say that they would know where to turn for help if experiencing a mental health issue, but only 55% say that they would be moderately likely or very likely to do so (Table

8). The numbers are lower (74% and 52%, respectively) for those reporting suicidal thoughts. Stigma, the difficulty of accessing services, and service quality could all be playing a role in generating this wedge between resource awareness and probability of access. Understanding the relative magnitudes of these barriers is an important area for further research.

3.2 Overall Work Experiences

Before turning to an exploration of how various PhD program structures and experiences could be affecting graduate student mental health, we first want to establish what those structures and experiences are. We use the 2015 RAND American Working Conditions Survey (Maestas et al. (2015)) to get an overview of the work environment and a sense of how it compares to what Americans generally experience in their jobs. The survey is based on a nationally representative sample of Americans and is administered online. We also use the RAND survey questions in our survey of faculty at the 8 participating departments, allowing us to compare graduate student experiences with faculty experiences. Our other reference point for graduate student work experiences is a 2017 study by *Nature* of more than 5,700 natural science and engineering PhD students worldwide (Woolston (2017)).

Across occupations in the United States, about 60% of men and women with a college degree between the ages of 25 and 35 report experiencing satisfaction of work well done always or most of the time. In contrast, 37% of economics PhD students report experiencing such satisfaction always or most of the time (Table 9). When economics faculty were posed the same question, 77% said they experienced such satisfaction always or most of the time.

26% of economics students report experiencing the feeling of doing useful work always or most of the time, compared to 70% of economics faculty and 63% of the entire working age population. Only 20% of economics students feel that they have opportunities to make a positive impact on their community or society compared to 58% of faculty and 53% of the population. Additionally, only 40% of PhD students feel they have opportunities to fully use their talents always or most of the time, compared to 85% of faculty and 53% of the population.

The economics PhD program thus appears to be distinct from the average occupation and from the economics professorship in the rarity with which one experiences satisfaction,

usefulness, and meaningfulness. Whereas faculty often have a set research agenda, students to advise, and courses in their field to teach, economics PhD students are more likely to face an unstructured environment without a regular sense of purpose. When asked what is most important for their sense of success in life, students put having a family first and knowing that they have made a useful contribution to the world second, above the importance of getting tenure at an academic institution (Table B.3). It is perhaps, then, not surprising that spending so much time in an environment that often does not produce a sense of usefulness could worsen mental health and push students into a self-perpetuating cycle of discouragement and disengagement. Another way to look at this is that being in a prolonged state of investing for the future, where the investment itself does not provide a day-to-day sense of meaningfulness, could be deteriorating mental health. This might be why we see student mental health worsening with time spent in the program.[10]

Differences between student and faculty feelings towards work are all the more striking given the experiences that students and faculty share. 73% of students and 72% of faculty report having very good friends in the department, compared to 56% of American workers. 62% of students worry always or most of the time about work when not working, compared to 60% of faculty members. 20.5% of students find themselves too tired for activities in private life always or most of the time, compared to 23% of faculty (Table 10).

The intensity of the work and the stresses that come with it thus do not seem to abate with professorship, while satisfaction, usefulness, and meaning increase. Though this could be a result of selection, with those who find academic research satisfying, useful, and meaningful going into and staying in academia, we believe that differences in work experiences, as well as differences in social standing, are driving our results. Although we frequently talk about academic professorship as a natural extension of the PhD, it is in reality a distinct experience experienced by only a fraction of PhD students.

When it comes to overall satisfaction with the PhD experience, economics programs look

[10] 9.4% of students say they seriously contemplated quitting the PhD program over the course of two or more days in the past 2 weeks (Table B.4). Given the top rankings of the programs in our sample and the likely better-than-average outside options faced by the students in these environments, we believe this percentage to be a lower bound for economics PhD students in general.

very similar to those in the natural sciences and engineering. As Figure 1 shows, economics PhD students are slightly more dissatisfied with their PhD experience, but the differences are negligible.[11] The differences are also negligible when it comes to the number of hours that PhD students report working in a typical week (Figure 2).

However, when we asked economics students what they would do differently if they were starting their program right now, we got starkly different responses from those found in the *Nature* study (Figure 3). While many in the natural sciences and in engineering would have changed advisers or area of study, those things were not of major concern to economics students. The unstructured nature of the research stage of most economics programs, which allows students to have more control over what they study and who advises them, is consistent with this finding. 36% of the economics students would have wanted to organize their time more effectively, compared to just 1% of students in the natural sciences and engineering. This also is likely a reflection of the unstructured nature of the research years, but could be a statement on the usefulness of the coursework years as well. The fact that 21% of economics students would have engaged more with their studies, compared to just 1% for those in the natural sciences, provides additional evidence that the coursework stage of the economics programs could be improved (through incentives for engaging more with study, through the usefulness of the content covered, etc.).

3.3 Relationships with Peers and Advisers

To learn more about the economics PhD environment, we asked students detailed questions about their interactions with their peers and advisers. Table 11 shows that 66% of students view their peers as not competitive at all or only somewhat competitive and, as mentioned earlier, 73% of students say they have very good friends in the department. Still, a sizable number of students feel isolated and out of place. 3% say that they never turn to someone when faced with a problem or worry and 6% say they have zero people in their personal life with whom they can talk about their most private feelings. Another 15% say that there is only one person in their personal life with whom they can be so open. 17.5% of students say

[11] A Kolmogorov-Smirnov test does not reject that the two distributions of student satisfaction are the same.

they often lack companionship and 16% say they often feel isolated from others.

Collaboration with other students, while widespread, is also elusive for a significant number of students. 29% said they mostly worked (or are working) alone on 1st year problem sets and 63% only have solo-authored projects. 11% of students do not spend any time working at their department (Table B.5). Though seminars have the potential to allow students and faculty to engage on the same level, many students do not feel comfortable engaging. 29% say they are moderately or very comfortable voicing a thought in a seminar setting, and 77% would only raise their hand if they were moderately or very certain about the high quality of their thought (Table B.6). These results are in line with those found in the AEA's recent Professional Climate Survey (Allgood et al. (2018)). We agree with the report's recommendations on this front and believe that making seminars more about helping presenters improve their work and less about one-upmanship from the audience can also improve mental health.

Women feel an especially high barrier to participation in seminars: only 19% of women would be comfortable voicing a thought in a seminar compared to 35% of men. Virtually no gap exists, however, between US students (30.5%) and international students (28.3%). The same percentage, 77%, of men and women would have to feel certain about the high quality of their thoughts before they voice them (Tables B.7-B.8). This suggests that either women have a higher internal bar for thought quality than men or that there are other factors affecting their comfort levels in seminars. Or both.

Student relationships with their faculty advisers are also nuanced. 96% of students say they met with their main adviser at least once in the last 2 months, with the mode number of meetings being 2 (Table 12). 86% met at least once with their second adviser and 67% met at least once with their third adviser.[12] Asked about the most significant impediments to the frequency with which they meet with faculty, students pointed to fear of the consequences of a bad impression, doubt about the quality of their ideas, questions, and thoughts, and lack of progress on to-dos from the previous meeting. Meeting unpleasantness was a significant impediment for 8% of students and scheduling difficulties were a significant impediment for

[12]We defined the main adviser as the faculty member with whom the student meets most frequently. The second adviser as the faculty member with whom the student meets second-most frequently, and so on.

17% of students (Table B.9).

As with seminars, these numbers suggest that focusing on what happens during the advising meetings could help improve student experiences. We believe that empowering students, treating seminars and advising meetings as constructive learning experiences and not as evaluative sessions, should lower student stress levels. One approach could be for faculty to actively communicate that they are leaving job market assessments for the very end of a student's graduate career. Committing to take a student's entire trajectory into account and to put the most weight on the final product when writing job market evaluations could improve student engagement over the course of the program and possibly mental health as well.

While most students have good, helpful relationships with their advisers, many do not receive adequate support and engagement. 27% of women and 34.5% of men say that their advisers do not care about them as a person. A gap also exists between US students (29%) and international students (34%). 19% think that their advisers do not care at all or care only somewhat about the success of their research (Table 13).

18% do not have a professional role model among the faculty in the department. 40% of men say they have 3 or more such role models, compared to 33.5% of women (Table B.10). 36% of students report that no faculty member had initiated an informal conversation with them about how they were doing academically or personally in the last 2 months.[13] 40% of international students report not having such faculty interactions, compared to 32% of US students.

We also asked students how honest they *would like to be* with their advisers about a range of difficulties and how honest they currently *can be* with their advisers about those difficulties (Table B.11). The difficulties were, by gap between desired levels of openness and actual levels of openness[14]: (1) non-academic career options, (2) preparing for the job market, (3) research progress, (4) issues with other advisers, (5) issues arising from co-authorship with the faculty

[13]The initial survey was administered in November, so the last 2 months would have been September and October. We also asked this question in our follow-up survey in May where 39% of students reported not having any informal conversations initiated by faculty about how they were doing in the last 2 months.

[14]We calculate this gap by taking the percent of students saying they *would like* to be very honest with their advisers about the topic and subtracting the percent of students saying they *can* be very honest with their advisers about it.

member, (6) presentations, (7) refereeing, (8) co-authoring with other students, (9) teaching, (10) decision to get a PhD, (11) mental health, (12) decisions related to starting a family, (13) other personal life issues.

Although fewer than 10% of students say they can be very honest with their advisers about mental health, starting a family, or other personal life issues, few students actually want to discuss these issues openly with their advisers. This is true for both men and women, international and US students.[15] Additionally, virtually the same percentage of students cannot be honest with advisers at all about research progress (38.7%) as say that they cannot be honest with advisers at all about mental health problems (41.5%) (Table B.11). Adviser-advisee communication issues thus go beyond a student's personal life difficulties and impede the core professional objectives of the advising relationship.

As our evidence for seminars and impediments to meetings with faculty also suggests, it is the adviser's dual role as supporter and evaluator that seems to be at the root of the problem. Section 4 elaborates on this conclusion and shows that the inability to discuss professional issues with advisers is strongly correlated with worse student mental health. While poor mental health may, for example, be the impediment to conversations about non-academic career options in some circumstances, we believe that other factors (such as concerns about future adviser support) are generally playing a bigger role.

There also appears to be a lack of options for students when they are experiencing issues with advising. 42% of students say that they would know where to turn for help with advising and only 36% say they would be moderately likely or very likely to seek out help if an issue arose (Table 14). Given the role of evaluator that faculty are playing, it may be difficult for students to see a way to address advising issues constructively and without negative consequences. By creating an honest relationship with students and coming to a mutual agreement with them on the most helpful advising practices, faculty could conceivably both improve student mental health and the usefulness of the meetings. Departments could also experiment with various advising schemes and feedback mechanisms. One approach we know of is to assign incoming

[15] Women and international students are slightly more likely to want to discuss mental health very honestly with their advisers than men and US students, respectively.

students to faculty members who have actively volunteered to advise more on navigating the program and less on specific research questions. Such an advising relationship, without any evaluative constraints, could be a valuable source of support for students even into the later research years and could help students navigate future relationships with dissertation committee members.

3.4 Sexual Harassment

In order to obtain a more complete picture about the departmental environment, we also asked questions about sexual harassment. Specifically, we wanted to know what share of students have experienced some form of sexual harassment from someone associated with their economics department, what form that harassment took, and who perpetrated it. For comparability purposes, we used the exact phrasing for these questions that was employed by the Association of American Universities (AAU) Climate Survey on Sexual Assault and Sexual Misconduct in 2015 (see Cantor et al. (2017)). The preamble to the questions emphasized that the situations the students should be thinking about are ones that interfered with their work, limited their ability to participate in their program, or created a hostile work environment.

16% of students experienced some form of sexual harassment in their department since starting the PhD program (Table 15). 21.5% of women experienced harassment compared to 13% of men; 22.2% of US students experienced harassment, compared to 8.9% of international students. 62.5% of the instances of harassment were perpetrated by another graduate student, while 19% came from a professor and about 10% from someone the student did not know. Advisers, undergraduates, and others affiliated with the department make up the remaining 9% of sexual harassment experiences.[16][17] For context, the AAU survey revealed that about 44% of women in graduate or professional programs had experienced some form of sexual harassment, compared to 30% of men.

In order from most common to least common, the following were forms of harassment experienced by economics PhD students: (1) sexual remarks, jokes, or stories that were insulting

[16] It is possible that students say they have experienced sexual harassment from professors but not from advisers because those professors are no longer their advisers.

[17] Experiences with sexual harassment in the department are weakly correlated with mental health outcomes (e.g., Pearson correlation of 0.079, statistically significant at the 10% level, with the PHQ-9 scale).

or offensive to you, (2) inappropriate or offensive comments about your or someone else's body, appearance, or sexual activities, (3) crude or gross sexual comments or tried to get you to talk about sexual matters when you did not want to, (4) requests to go out for dinner, have drinks, or have sex even though you said, "No", and (5) Email(s), text(s), phone call(s), or instant message(s) with offensive sexual remarks, jokes, stories, pictures, or videos that you did not want to receive.

Although the prevalence of sexual harassment appears to be lower in economics PhD programs than in graduate and professional programs nationwide, the problem is still substantial. Understanding the prevalence and characteristics of harassment is the first step and we hope the statistics we present here will help students and faculty hold each other to a higher standard. Departmental leadership could also approach the problem proactively by, for example, bringing in university Title IX coordinators to discuss why certain behaviors are problematic and what students should do when they experience or witness it. Making students aware of the new AEA ombudsperson and of other reporting tools, such as Callisto, early on in the program are other good proactive steps that departments can take. In general, conversations with students and faculty that clearly set out expectations for conduct and alert the community of the nature of the problem should help create a better work environment.

4 Potential Connections Between Mental Health and Work Experiences

What is the connection between student mental health and the work experiences we describe above? In line with other studies of the effects of workplace conditions on mental health (e.g., Woo and Postolache (2008)), our work provides suggestive evidence of a connection. One such piece of evidence is that of those who are currently experiencing moderate to severe symptoms of depression, 19% were diagnosed with a mental health issue before starting their program while 26% were diagnosed after starting their program. Of those who were diagnosed after starting their program, 19% have contemplated suicide in the past 2 weeks; of those who were diagnosed before the PhD, 10% contemplated suicide in the past 2 weeks

(Table B.12). Thus, those who were diagnosed with mental health issues as PhD students are more likely to have worse mental health today than those diagnosed before the PhD program.

Another piece of evidence is the fact that older cohorts of students have worse mental health than younger cohorts. 14.5% of first-year students experienced moderate to severe symptoms of depression (in November of their first year), with the number climbing to 25% for those who are in years 5+ of the program. The numbers are similar for anxiety: 12% of first-year students experienced moderate to severe anxiety, compared to 24% for those in years 5+. When it comes to suicidal ideation, 7% of the first-years report contemplating suicide in the last 2 weeks, compared to 13% of those in years 5+ (Tables 3-5). In addition to an accumulation of stress and the pressure of performing well on the job market, the latter years of the PhD program are also frequently characterized by a lack of structure and increased isolation. We believe that all of these factors are contributing to the pattern we observe.

We find further evidence when looking at ANOVA tests of mean differences of depression (PHQ-9), anxiety (GAD-7), suicidality (SBQR), and other scores that we performed across background characteristics and experiences. We can reject the null hypothesis that the mean scores are identical across groups for all but a few of the background characteristics and experiences. Most notably, if we sort people into groups by what they said they would do differently if they were starting their PhD program over, we can reject at the 1% level that the mental health score means are the same (Table B.13).

Of those who say that they would change their area of study, 28% contemplated suicide in the last 2 weeks. 27% of those who said they would not pursue a PhD at all, 24% of those who said they would study at another institution, and 20% of those who would change their advisers also contemplated suicide in the last 2 weeks.[18] Even though the most common responses from economics students on what they would do differently were to engage more with study and organize time more effectively, both groups of students have a substantially lower share of students (11%) that have contemplated suicide. Those who say they would change nothing about their graduate school experience have the lowest rate of suicidal ideation, at 7%.

[18]Students could select more than one option for what they would do differently.

These trends are also present for our other measures of mental health.[19] While it is possible that poor mental health is the cause of graduate school regrets and not the other way around, it is not clear why depression or anxiety or suicidality would cause some regrets but not others. Regardless of the direction of causality, we see that one's mental health and one's graduate school experience are closely linked.

Correlating student experiences with mental health provides us with additional evidence of this link. The more competitive students think their peers are with each other, the worse their mental health. Having more very good friends at one's economics department is correlated with better mental health, as is having more people in general with whom a student can openly discuss their private feelings without having to hold back (Table 11). Supportive and collaborative classmates, people who understand the PhD experience, and others who can be trusted to have the student's best interests in mind appear to be valuable tools for mitigating shocks to mental health.

Such friendships, however, might not be formed in the way we might expect. The size of one's problem set study group in the first year is not correlated with depression or anxiety later in the program. Neither are co-authorship with other students or with faculty. So, it seems, key friendships and sources of support emerge in other ways. What we can say, though, is that study group size, co-authorship, and number of days spent working in the department per week are negatively correlated with feelings of loneliness and isolation (Table B.5) and are thus behaviors that could be protective.

Mental health issues do not appear to be affecting students with different values in life differently. In particular, students who believe that tenure at an academic institution is very important for their success in life are not more or less likely to have mental health issues than students who believe that income or recognition or a family are very important for success in life (Table B.3). We see this as an important finding, suggesting that it is not possible to use a student's aspirations and values to infer mental health. Caring more about having a family

[19] It is worth noting that we find those who live alone have a statistically higher probability of having contemplated suicide in the last two weeks (16% vs. 9%). The same is true when we compare those who are gay or lesbian with those who are heterosexual (21% vs. 9%). These findings are in line with findings by other studies in this space (e.g., UCOP (2017)).

than about getting tenure at a top-ranked institution does not make one more or less resilient to mental health issues.

In addition to strong social support, having sources of meaning and usefulness appears to be important for mental health. Those who have goals to aspire to, feelings of doing useful work, and opportunities to make a positive impact on their surroundings have better mental health than those who do not (Table 9). At the same time, when work fatigue and worries negatively affect activities in private life, mental health is worse (Table 10). In line with existing literature (e.g., Layard and Clark (2015)), students who have difficulties making ends meet financially are also more likely to have mental health problems. Those with worse mental health also have worse engagement with their programs along a few dimensions. They are less likely to voice a thought in a seminar and substantially more likely to seriously contemplate leaving the program (Table B.6). They are also more pessimistic about how well they have done and will do in their courses, teaching, presentations, and (especially) research (Table B.14).

Advising relationships also appear to be tightly related to student mental health, likely through both the social support channel and the usefulness of work channel. Students who talk to faculty that care about their success and care about them as a person have better mental health than students who do not (Table 13). While the number of meetings that students have with their main adviser or with faculty more broadly is not correlated with mental health (Table 12), the nature of those meetings is. Students who say they avoid meetings with faculty because those meetings are unpleasant have worse mental health than students who do not feel that meetings are unpleasant. Students for whom fear of the consequences of a bad impression, or doubt about the quality of their work, or lack of progress since the previous meeting are big impediments to talking to faculty also have worse mental health than those students who do not experience such impediments. In contrast, students whose biggest issues with meetings are that they are too short or too difficult to schedule do not have worse mental health than students for whom those factors are not problems (Table B.9).

How honest a student can be with their adviser about difficulties in the program is also

correlated with that student's mental health. We dove deeply into those difficulties, asking students to tell us how honest they can be with their advisers about problems that ranged from research progress and presentations to mental health and starting a family. While students who cannot honestly and openly discuss mental health with their adviser have worse mental health, it is also true that students who cannot openly discuss problems with presentations and research progress also have worse mental health. Openness on teaching, preparing for the job market, considering non-academic jobs, and reflecting on whether doing the PhD was the right decision are all also correlated with student mental health (Table B.11). In other words, what matters is whether the relationship between student and adviser is trusting and honest, not whether the problems are professional or personal.

Whether mental health problems are causing a lack of honesty and openness in advising relationships or the lack of honesty and openness is causing mental health problems, it is clear that many students could be having better relationships with their advisers. These results are especially striking since few students say that they regret the field they have selected or their advisers. To us, this suggests that allowing students to move easily across fields and advisers, something that many departments already do, is not enough. Given the tenure incentives for faculty and the low weight that departments generally put on teaching and advising, a free advising market is unlikely to generate the necessary competitive forces that would improve student-adviser relationships on their own across the board.

Creating a channel for faculty to receive constructive feedback on their advising, perhaps by allowing anonymous student evaluations of each faculty's advising strengths and weakness that are collated over a several year period, could help each faculty member understand what he or she can do better. If our results are any indication, a substantial part of that improvement will be in figuring out ways to better balance the role of adviser and evaluator so as to facilitate honest and open conversations with students. Social or even financial incentives for such advising could also be explored. Certainly, a change in culture to the point where students and advisers can openly and harmlessly agree on an advising relationship that works best for both parties could go a long way. If the arrow of causality points the other way, then making

a concerted effort to improve student mental health should improve advising relationships and student productivity.

5 Conclusion

Our study of graduate economics PhD programs establishes several important features of graduate student mental health and its relationship to student experiences. A significant portion of graduate students in our sample report poor mental health. Moderate or severe symptoms of depression and anxiety are prevalent among these graduate students (18%), with rates that are more than triple those of the general population. Over a tenth of students report having suicidal ideation on at least several days over the past two weeks. The average PhD student in our study reports more feelings of loneliness than does the average retired American. Although 90 percent of students with moderate or severe symptoms of depression would be expected to have a diagnosable clinical disease, only 19% of these students are currently in treatment for depression. Students often feel limited meaning in their work and in their ability to make a positive impact on their community. 20% feel that they have opportunities to make a positive impact on their community or society, whereas 58% of faculty and 53% of the population report feeling they have these opportunities. 21.5% of female and 13% of male graduate students have experienced sexual harassment in their department, with the majority of incidents perpetrated by other graduate students.

We measure notable correlates between mental health and student experiences. Students in later years are more likely to have high levels of depressive or anxious symptoms. Students who express regrets about their PhD experience have higher rates of mental health distress. 27% of those who regret pursuing a PhD contemplated suicide in the past two weeks, compared to 7% of those who expressed no regrets about graduate school. Having friends and advisers with whom students can openly and honestly discuss their difficulties is correlated with better mental health. Overall, our work points to the importance of improving collegiality, encouraging collaboration, helping students find meaning in their work, and lowering barriers to high quality mental health care as the keys to improving graduate student mental health.

Below, we include six specific recommendations for students, faculty, department lead-

ership, and university administrators on ways to improve graduate school experiences and student mental health. Please see the Appendix for free-form advice that economics faculty submitted through the supplemental faculty survey.

First, we recommend that department leaders raise awareness of mental health issues among graduate students, raise awareness of available mental health resources, and encourage students to take their mental health and the health of their peers seriously. Doing so early in the program, as early as math camp, should make it easier to tackle issues when they arise later on. Encouragement can involve asking students to arrange for a consultation with campus mental health services, to use online screening tools often provided by campus mental health services to identify depression and anxiety symptoms, or simply to feel comfortable seeking support. This should help reduce the stigma of prioritizing mental health and seeking support when necessary.

Second, department leaders could use their platform to encourage students to build friendships with their peers and to actively avoid prolonged isolation. In the same vein, we recommend discouraging competitive attitudes, while encouraging collaboration, peer advising, and co-authorship among students across years in the program.

Messaging these points to students is key, but departments could also think more from a design perspective about how the requirements throughout the program, the physical spaces, and the financial and advising resources made available to students can encourage collaboration. Students themselves could work on organizing more informal activities and resources for each other, modeling the mutual helpfulness that such activities should strive to foster. These steps should help reduce feelings of isolation and loneliness, while also helping students build strong social networks that will serve them well into their professional lives.

Third, improving student-faculty advising relationships could help students identify promising directions for research and bounce back better from setbacks. One element of the strain could be that advisers play a dual role – one of support and one of evaluation. Harvard has started connecting students early on with faculty who have volunteered to advise students in the pre-research years. Such advising relationships, established outside of the dissertation

committee structure, may provide students with faculty support that does not come bundled with consequential evaluation. These advisers could also help students navigate their relationships with other faculty members and help address other issues with advising. Knowing that the prevalence of mental health issues worsens over the course of the program, we conclude that helping students build a strong support structure early on in the program should help them better navigate the shocks that arise later in the program.

Fourth, relatedly, we recommend instituting policies that help advisers ensure that students are not falling through the cracks and are progressing with their projects. In programs where the advising structures are more diffuse, field-specific meetings among faculty to discuss student progress could be a good way to do this. If, for example, none of the faculty have interacted with the student in a while, the most relevant faculty member could be tasked with checking in with that student. If a student is stuck, such faculty meetings could also allow faculty to brainstorm and triage solutions. Another approach could involve students and faculty establishing a regular check-in schedule, with a mutual understanding that such meetings are not just meant for showcasing progress but are also for working through problems.

Fifth, with so few students finding meaning in their work, we think it would be useful to encourage students to prioritize researching the questions they find meaningful over questions that might yield the best academic job market outcome (where those two sets of questions do not overlap). It is natural for students completing their final educational chapter to be wrestling with meaning and the focus of their future professional lives. The reality is that many students ultimately find meaning and focus outside of academia, and yet many find conversations with advisers about non-academic trajectories to be difficult. Efforts to normalize private and public sector opportunities, by celebrating alumni who work in those sectors and perhaps even inviting them to talk to current students, should help alleviate the mental distress that comes with transitioning out of graduate school.

Sixth, departments could partner with campus mental health services to experiment with different approaches to mental health treatment. Some departments have experimented with peer support groups and "Let's Talk" programs that make campus mental health professionals

available for drop-in hours close to the department. Other low-cost interventions that reduce barriers to care-seeking deserve further research. Cognitive Behavioral Therapy (CBT) interventions also deserve more attention. Working with the Psychology Department, Harvard's Economics Department offered a 2 hour transdiagnostic CBT workshop for graduate students that is now being offered to other departments. The intervention aimed to enhance emotion regulation skills through psychoeducation, group discussion, and supervised practice of the skills. We know CBT works in other settings and the preliminary results from this intervention are also promising. More research and experimentation with such tools holds substantial promise for addressing the problems we document in this study.

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Tables and Figures

Table 1: Total invited and responding survey participants, by university

Programs	Total invited	Total responded	% responded	% of all responses
UC Berkeley	131	71	54.2%	13.8%
Columbia	149	71	47.7%	13.8%
Harvard	190	73	38.4%	14.2%
MIT	130	76	58.5%	14.8%
Princeton	129	55	42.6%	10.7%
UC San Diego	127	50	39.4%	9.7%
U of Michigan	163	66	40.5%	12.9%
Yale	117	51	43.6%	9.9%
Total	1136	513	45.2%	100.0%

Note: Table shows, for each participating economics PhD program, the total number of students receiving the Fall 2017 survey; the total number of students who took the survey; the percent of invited students who took the survey; and the percent of the entire sample represented by students from each program.

Table 2: Invited and responding survey participants, by graduate year

Year	% Resp	% Fem	% Resp Fem	% US Undergrad	% Resp US Undergrad
1	44.4%	28.7%	38.4%	52.0%	57.6%
2	54.7%	31.1%	32.7%	49.5%	50.5%
3	44.0%	26.3%	33.8%	52.0%	54.5%
4	43.2%	30.1%	36.4%	47.6%	51.1%
5	47.7%	27.9%	37.0%	46.0%	48.8%
6+	36.0%	26.2%	30.5%	57.6%	58.6%
Total	45.2%	28.4%	34.7%	50.8%	53.5%

Note: Table shows, for each graduate year, the response rate for the Fall 2017 survey; the percent of students in the participating programs who are female; the percent of survey respondents who are female; the percent of students in the participating programs who received their undergraduate degree at a US institution; and the percent of survey respondents who received their undergraduate degree at a US institution.

Table 3: Depression symptoms by year in program

PHQ-9 Score	Category	G1	G2	G3	G4	G5	G6+
0 to 4	Minimal depression	45.8%	46.2%	44.7%	50.0%	40.7%	37.3%
5 to 9	Mild depression	39.6%	38.5%	39.5%	37.2%	34.6%	37.3%
10 to 14	Moderate depression	10.4%	12.5%	11.8%	7.0%	16.0%	13.6%
15 to 19	Moderately severe depression	3.1%	1.9%	1.3%	5.8%	7.4%	8.5%
>=20	Severe depression	1.0%	1.0%	2.6%	0.0%	1.2%	3.4%

Note: PHQ-9 measures symptoms of depression. Symptom intensity increases as PHQ-9 scores increase. Mental health professionals use a score of 10 as a cutoff when diagnosing individuals with depression.

Table 4: Anxiety symptoms by year in program

GAD-7 Score	Category	G1	G2	G3	G4	G5	G6+
0 - 4	No anxiety	57.1%	60.6%	53.2%	45.5%	46.9%	35.0%
5 - 9	Mild anxiety	30.6%	26.9%	27.3%	36.4%	32.1%	36.7%
10 - 14	Moderate anxiety	9.2%	10.6%	14.3%	13.6%	16.0%	20.0%
>=15	Severe anxiety	3.1%	1.9%	5.2%	4.5%	4.9%	8.3%

Note: GAD-7 measures symptoms of anxiety. Symptom intensity increases as GAD-7 scores increase. Mental health professionals use a score of 10 as a cutoff when diagnosing individuals with anxiety disorder.

Table 5: Suicidal ideation by year in program

PHQ-9 Final Question	Category	G1	G2	G3	G4	G5	G6+
0	not at all	92.7%	94.2%	86.8%	83.7%	93.8%	78.0%
>= 1	more than zero days	7.3%	5.8%	13.2%	16.3%	6.2%	22.0%

Note: The PHQ-9 Final Question measures suicidality by asking on how many days over the past two weeks a student was bothered by suicidal thoughts.

Table 6: Percent of students scoring above critical thresholds

Category	All	Male	Female	US Undergrad	Non-US Undergrad
Depression (PHQ-9)	17.7%	16.4%	18.3%	19.2%	15.5%
Anxiety (GAD-7)	17.6%	15.9%	19.2%	17.9%	16.9%
Suicidality 2-weeks (PHQ-9 Final Q)	11.3%	11.6%	10.2%	9.3%	13.1%
Suicidality 1-year (SBQR)	12.0%	12.0%	10.9%	9.8%	13.6%
Eating Disorder	31.8%	26.1%	41.8%	36.3%	27.0%
ADHD	26.8%	28.0%	24.9%	23.1%	30.9%
Physical Exercise	79.0%	80.7%	75.6%	78.4%	80.3%
Alcohol	57.4%	56.5%	59.2%	58.7%	56.2%

Note: Table shows percent of students scoring above thresholds for concern. Depression and Anxiety show those scoring 10 or higher on the PHQ-9 and GAD-7, respectively. Suicidality 2-weeks are those reporting contemplating suicide on at least several days in the last two weeks, as captured by the last question on the PHQ-9. Suicidality 1-year are those scoring 7 or higher on the SBQR suicidality screen which contains 1-year look-back questions. Eating Disorder and ADHD report percentages of those scoring in concerning territory for issues with eating patterns and with Attention Deficit Hyperactivity Disorder, respectively. Physical Exercise shows percentages of those not meeting American College of Sports Medicine, Center for Disease Control and Prevention, and American Heart Association recommendations for exercise levels. Alcohol shows percentages of those drinking more than recommended amounts, as captured by the AUDIT-C screen.

Table 7: Number and percentage of respondents receiving treatment for depression, anxiety, or any mental health issue

Panel A: Depression				
PHQ-9 Score	Category	Number	Number in Treatment	Percent in Treatment
0 to 4	none-minimal	225	5	2.2%
5 to 9	mild	190	16	8.4%
10 to 14	moderate	60	11	18.3%
15 to 19	moderately-severe	22	4	18.2%
>=20	severe	7	2	28.6%
Panel B: Anxiety				
GAD-7 Score	Category	Number	Number in Treatment	Percent in Treatment
0 to 4	none-minimal	261	11	4.2%
5 to 9	mild	159	19	11.9%
10 to 14	moderate	68	15	22.1%
>=15	severe	22	4	18.2%
Panel C: Suicidality				
PHQ-9 Final Question Score	Category	Number	Number in Treatment	Percent in Treatment
0	not at all	448	61	13.6%
>= 1	more than zero days	56	15	26.8%

Note: PHQ-9 measures symptoms of depression. GAD-7 measures symptoms of anxiety. Symptom intensity increases as PHQ-9 and GAD-7 scores increase. Mental health professionals use a score of 10 on the PHQ-9 and the GAD-7 as a cutoff when diagnosing individuals with depression or anxiety disorder, respectively. The PHQ-9 Final Question measures suicidality by asking on how many days over the past two weeks a student was bothered by suicidal thoughts. Treatment in Panel A means treatment for depression; in Panel B, treatment for anxiety; in Panel C, treatment for any mental health issue.

Table 8: Help with mental health: experiences and correlations with mental health outcomes

Panel A: Experiences

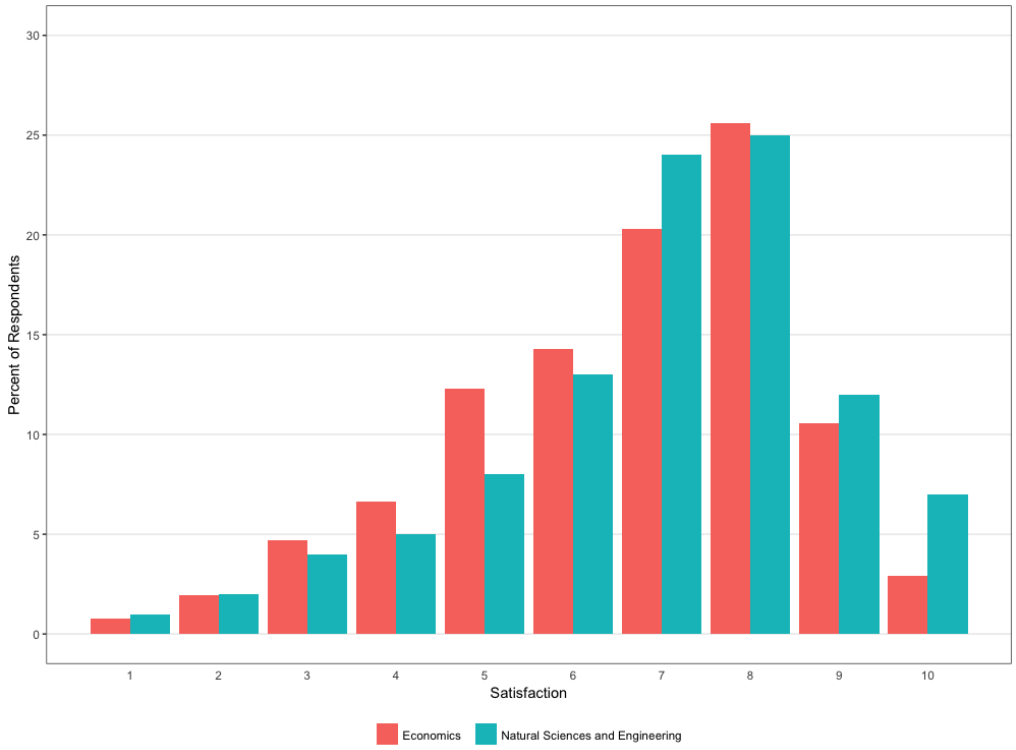
Question and Answer	Number	Percent
If issue with mental health, would you know where to turn for help?		
Yes	447	87.1%
No	66	12.9%
If issue with mental health, how likely would you be to turn to someone for help?		
Not likely	66	12.9%
Somewhat likely	164	32.0%
Moderately likely	128	25.0%
Very likely	155	30.2%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
If issue with mental health, would you know where to turn for help?	-0.103 **	-0.070	-0.141 ***	-0.193 ***
sig	0.021	0.113	0.001	0.000
n	504	510	512	511
If issue with mental health, how likely would you be to turn to someone for help?	-0.191 ***	-0.092 **	-0.132 ***	-0.197 ***
sig	0.000	0.037	0.003	0.000
n	504	510	512	511

Note: A higher response value indicates knowing where to turn for help and a greater likelihood of turning to someone for help. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = p<0.1, ** = p<0.05, *** = p<0.01.

Figure 1: On a scale of 1 to 10, where 1 = Extremely dissatisfied and 10 = Extremely satisfied, how satisfied are you with your PhD experience?



Note: Results for Natural Science and Engineering PhD students come from Woolston (2017).

Table 9: RAND meaningfulness of work: experiences and correlations with mental health outcomes

Panel A: Experiences

Question and Answer	Number	Percent
Opportunities to fully use your talents		
Always	43	8.7%
Most of the time	161	32.5%
Sometimes	224	45.2%
Rarely	60	12.1%
Never	8	1.6%
Opportunities to make positive impact on community/society		
Always	18	3.7%
Most of the time	80	16.4%
Sometimes	156	31.9%
Rarely	174	35.6%
Never	61	12.5%
Sense of personal accomplishment		
Always	39	7.7%
Most of the time	131	25.8%
Sometimes	241	47.5%
Rarely	84	16.6%
Never	12	2.4%
Goals to aspire to		
Always	79	15.6%
Most of the time	189	37.3%
Sometimes	174	34.3%
Rarely	53	10.5%
Never	12	2.4%
Satisfaction of work well done		
Always	38	7.5%
Most of the time	135	26.5%
Sometimes	220	43.2%
Rarely	101	19.8%
Never	15	2.9%
Feeling of doing useful work		
Always	31	6.1%
Most of the time	103	20.3%
Sometimes	233	45.9%
Rarely	113	22.2%
Never	28	5.5%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
Opportunities to fully use your talents	-0.364 ***	-0.240 ***	-0.187 ***	-0.331 ***
sig	0.000	0.000	0.000	0.000
n	487	493	495	494
Opportunities to make positive impact on community/society	-0.231 ***	-0.113 **	-0.120 ***	-0.186 ***
sig	0.000	0.013	0.008	0.000
n	480	486	488	487
Sense of personal accomplishment	-0.366 ***	-0.304 ***	-0.123 ***	-0.295 ***
sig	0.000	0.000	0.005	0.000
n	498	504	506	505
Goals to aspire to	-0.272 ***	-0.238 ***	-0.166 ***	-0.292 ***
sig	0.000	0.000	0.000	0.000
n	498	504	506	505
Satisfaction of work well done	-0.364 ***	-0.325 ***	-0.128 ***	-0.343 ***
sig	0.000	0.000	0.004	0.000
n	500	506	508	507
Feeling of doing useful work	-0.313 ***	-0.226 ***	-0.137 ***	-0.269 ***
sig	0.000	0.000	0.002	0.000
n	499	505	507	506

Note: These questions were borrowed from the RAND American Working Conditions Survey (Maestas et al. (2015)). A higher response value indicates a respondent's work provides more of each question item. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = $p<0.1$, ** = $p<0.05$, *** = $p<0.01$.

Table 10: RAND work issues: experiences and correlations with mental health outcomes

Panel A: Experiences

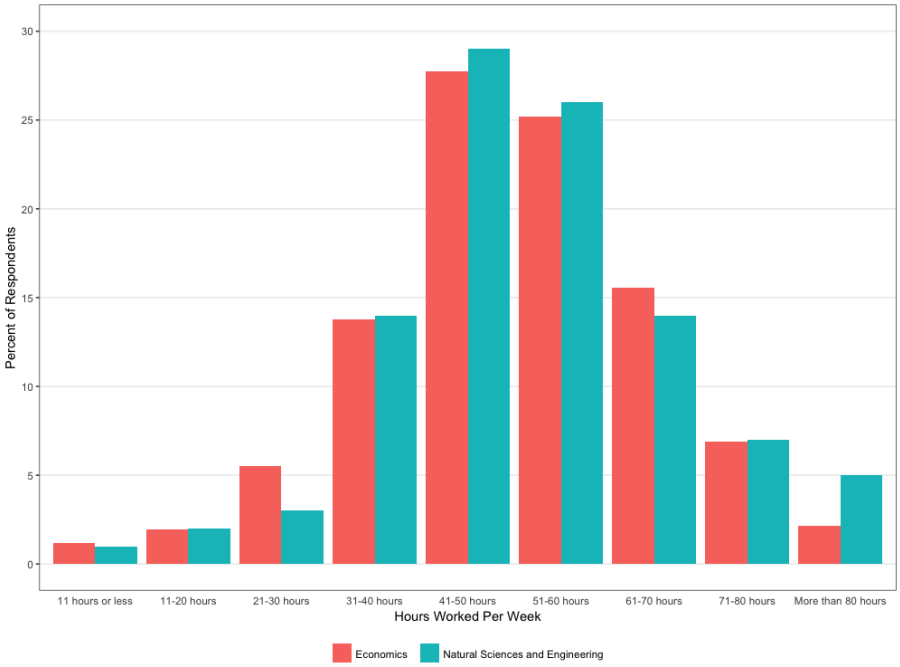
Question and Answer	Number	Percent
Worried about work when not working		
Always	103	20.1%
Most of the time	214	41.8%
Sometimes	160	31.2%
Rarely	32	6.2%
Never	3	0.6%
Were too tired for activities in private life		
Always	25	4.9%
Most of the time	80	15.6%
Sometimes	251	49.0%
Rarely	128	25.0%
Never	28	5.5%
Were too tired to do household jobs		
Always	32	6.2%
Most of the time	94	18.3%
Sometimes	217	42.3%
Rarely	137	26.7%
Never	33	6.4%
Had difficulty making ends meet financially		
Always	13	2.5%
Most of the time	29	5.7%
Sometimes	58	11.3%
Rarely	137	26.7%
Never	276	53.8%
Had work prevent time with family or significant others		
Always	34	6.7%
Most of the time	90	17.6%
Sometimes	200	39.1%
Rarely	117	22.9%
Never	70	13.7%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
Worried about work when not working	0.354 ***	0.437 ***	0.140 ***	0.237 ***
sig	0.000	0.000	0.002	0.000
n	503	509	511	510
Were too tired for activities in private life	0.354 ***	0.407 ***	0.221 ***	0.268 ***
sig	0.000	0.000	0.000	0.000
n	503	509	511	510
Were too tired to do household jobs	0.331 ***	0.364 ***	0.132 ***	0.240 ***
sig	0.000	0.000	0.003	0.000
n	504	510	512	511
Had difficulty making ends meet financially	0.215 ***	0.227 ***	0.082 *	0.193 ***
sig	0.000	0.000	0.065	0.000
n	504	510	512	511
Had work prevent time with family or significant others	0.234 ***	0.350 ***	0.109 **	0.142 ***
sig	0.000	0.000	0.014	0.001
n	502	508	510	509

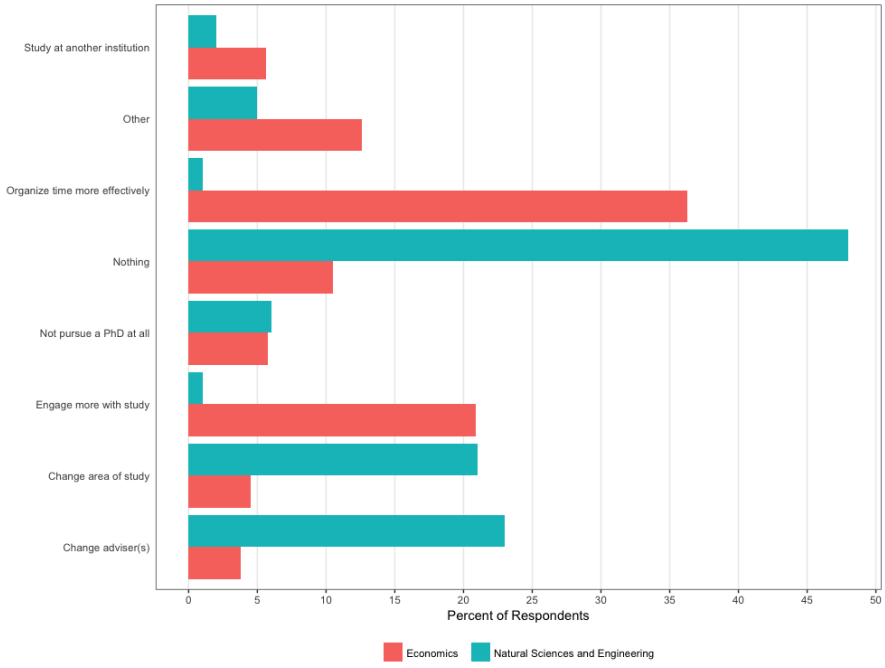
Note: These questions were borrowed from the RAND American Working Conditions Survey (Maestas et al. (2015)). A higher response value indicates a respondent experienced more moments of each question item. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = $p<0.1$, ** = $p<0.05$, *** = $p<0.01$.

Figure 2: On average, how many hours a week do you typically work?



Note: Results for Natural Science and Engineering PhD students come from Woolston (2017).

Figure 3: What would you do differently right now if you were starting your program?



Note: Results for Natural Science and Engineering PhD students come from Woolston (2017).

Table 11: Social sources of support: experiences and correlations with mental health outcomes

Panel A: Experiences

Question and Answer	Number	Percent
Number of people you can really open up to		
0	30	5.8%
1	75	14.6%
2 - 5	314	61.2%
6 - 10	78	15.2%
11 - 15	8	1.6%
16 - 20	4	0.8%
More than 20	4	0.8%
How often share problem or worry?		
Never	17	3.3%
Sometimes	248	48.4%
Most of the Time	187	36.5%
Always	60	11.7%
I have very good friends at my Economics Department.		
Strongly agree	197	38.4%
Agree	176	34.3%
Neither agree nor disagree	76	14.8%
Disagree	43	8.4%
Strongly disagree	21	4.1%
How competitive are your peers?		
Not competitive at all	124	24.2%
Somewhat competitive	213	41.6%
Moderately competitive	118	23.0%
Very competitive	57	11.1%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
Number of people you can really open up to	-0.203 ***	-0.123 ***	-0.232 ***	-0.286 ***
sig	0.000	0.005	0.000	0.000
n	504	510	512	511
How often share problem or worry?	-0.182 ***	-0.067	-0.162 ***	-0.222 ***
sig	0.000	0.132	0.000	0.000
n	503	509	511	510
I have very good friends at my Economics Department.	-0.233 ***	-0.144 ***	-0.182 ***	-0.437 ***
sig	0.000	0.001	0.000	0.000
n	504	510	512	511
How competitive are your peers?	0.222 ***	0.272 ***	0.143 ***	0.250 ***
sig	0.000	0.000	0.001	0.000
n	503	509	511	510

Note: A higher response value indicates more people to open up to, more often letting someone know about a problem, more friends in the Economics Department, and more perceived competition among peers. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = $p<0.1$, ** = $p<0.05$, *** = $p<0.01$.

Table 12: Number of meetings with main adviser: experiences and correlations with mental health outcomes

Panel A: Experiences

Question and Answer	Number	Percent
In the last 2 months, # of times met with main adviser		
0	17	4.4%
1	49	12.6%
2	77	19.8%
3	63	16.2%
4	62	15.9%
5	32	8.2%
6-10	74	19.0%
11-15	7	1.8%
15+	8	2.1%
In the last 2 months, total # of times met with three advisers		
0	0	0.0%
1	0	0.0%
2	0	0.0%
3	10	3.6%
4	10	3.6%
5	21	7.6%
6-10	129	46.7%
11-15	78	28.3%
15+	28	10.1%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
In the last 2 months, # of times met with main adviser	-0.005	0.077	0.002	-0.059
sig	0.920	0.129	0.968	0.245
n	383	387	388	387
In the last 2 months, total # of times met with three advisers	-0.074	0.079	-0.035	-0.160 ***
sig	0.228	0.190	0.567	0.008
n	270	274	275	276

Note: A higher response value indicates greater times met with advisers. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = p<0.1, ** = p<0.05, *** = p<0.01.

Table 13: Perceptions of faculty care: Experiences and correlations with mental health outcomes

Panel A: Experiences		
Question and Answer	Number	Percent
How much do advisers care about the success of your research project(s)?		
Do not care at all	10	2.3%
Care somewhat	72	16.6%
Care moderately	149	34.3%
Care very much	204	46.9%
How much do advisers care about you as a person?		
Do not care at all	36	7.8%
Care somewhat	129	28.0%
Care moderately	178	38.6%
Care very much	118	25.6%

Panel B: Pearson correlations with mental health outcomes				
Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
How much do advisers care about the success of your research project(s)?	-0.184 ***	-0.164 ***	-0.161 ***	-0.230 ***
sig	0.000	0.001	0.001	0.000
n	427	433	434	433
How much do advisers care about you as a person?	-0.236 ***	-0.245 ***	-0.160 ***	-0.269 ***
sig	0.000	0.000	0.001	0.000
n	452	459	460	459

Note: A higher response value indicates greater perceived care. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = p<0.1, ** = p<0.05, *** = p<0.01.

Table 14: Help with advising: experiences and correlations with mental health outcomes

Panel A: Experiences		
Question and Answer	Number	Percent
If issue with advising, would you know where to turn for help?		
Yes	209	41.9%
No	290	58.1%
If issue with advising, how likely would you be to turn to someone for help?		
Not likely	117	23.4%
Somewhat likely	203	40.7%
Moderately likely	116	23.2%
Very likely	63	12.6%

Panel B: Pearson correlations with mental health outcomes				
Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
If issue with advising, would you know where to turn for help?	-0.188 ***	-0.170 ***	-0.118 ***	-0.169 ***
sig	0.000	0.000	0.008	0.000
n	490	496	498	497
If issue with advising, how likely would you be to turn to someone for help?	-0.250 ***	-0.235 ***	-0.215 ***	-0.242 ***
sig	0.000	0.000	0.000	0.000
n	490	496	498	497

Note: A higher response value indicates knowing where to turn for help and a greater likelihood of turning to someone for help. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = p<0.1, ** = p<0.05, *** = p<0.01.

Table 15: Have you experienced sexual harassment in your department?

	All	Male	Female	US Undergrad	Non-US Undergrad
Yes	16.2%	13.0%	21.5%	22.2%	8.9%

Note: Table shows percentage of each group of students that report having experienced some form of sexual harassment from someone in their department. For exact question wording, see survey instrument in Appendix C1.

Appendix A: Faculty Recommendations on Working with Students Who Are Experiencing Mental Health Issues

1. "Listen, be kind, advise them to go to counselling, say that getting treated is no more shameful than wearing glasses, listen some more"

2. "Be empathetic, patient, and understanding - and refer them to mental health professionals."

3. "Engage with the student. Show empathy. Relate own experiences."

4. "Try not to equate a difficulty getting things done with laziness."

5. "Be supportive but also encourage the student to access the resources available on campus, including trained mental health professionals."

6. "Direct them to school mental health services, many have no idea it exists, or would not consider this an option for cultural reasons etc. Telling them this is completely normal and a widely used resource has been helpful in the past in my experience. Students have taken it up and have found it helpful."

7. "Be patient with them, give them time to sort out issues, and help give them a long run perspective on things so that they're not so worried about short term achievements / immediate research progress"

8. "Listen carefully, be supportive, and remember that with appropriate support the student's mental health issue does not need to be a barrier to success in PhD and beyond."

9. “The key in all cases is followup...absolutely essential. Do not wait. A same-day follow up call shows that you care. There is a real risk that without that the student will continue a downhill spiral and do nothing, until it gets much worse."

10. “Address it right away, don’t wait for it to become extreme. Don’t try to talk to the student as a therapist, but do (strongly) encourage him/her to go to therapy --- most likely the campus offers some decent free service. Tell them that it is absolutely normal, that even successful and bright people go through dark times.”

11. “Become familiar with resources available on campus for support and direct students to those resources.”

12. “Try to open lines of communication so that the student can talk with you without feeling that this will impact their academic standing or progress; urge the student to reach out to mental health professionals; try to help the student find a support network, whether making contact with family, talking with friends, or contacting a religious leader; reassure the student by explaining that many students face -- and overcome -- mental health issues”

13. “I think it’s difficult from a faculty perspective to see the difference between lack of progress because of (a) lack of effort and (b) a mental health issue that prevents focus/etc. I think discussion and training on this distinction is crucial.”

14. “I don’t have great advice, but I think this is a seriously under appreciated problem. All departments should have clear procedures for what professors should do if they think a student could use help in this domain (which I believe many do), so that students can get help without being stigmatized”

Appendix B: Additional Tables

Table B.1: Student Background Characteristics

	All	Male	Female	US Undergrad	Non-US Undergrad
Gender Identity					
Man	64.7%	100.0%	0.0%	63.9%	65.4%
Woman	34.7%	0.0%	100.0%	34.9%	34.6%
Other	0.6%	0.0%	0.0%	1.1%	0.0%
Age					
Younger than 20	0%	0%	0%	0%	0%
20-24	18.8%	18.8%	19.2%	23.0%	14.3%
25-29	66.9%	63.5%	72.3%	64.3%	69.6%
30-34	13.3%	16.7%	7.3%	11.2%	15.6%
35 or older	1.0%	0.9%	1.1%	1.5%	0.4%
Race					
American Indian or Alaska Native	0.5%	0.8%	0%	0.4%	0.8%
Asian or Asian American	26.0%	21.8%	34.2%	25.4%	26.5%
Hispanic or Latino	11.7%	12.1%	11.1%	5.3%	18.8%
Black or African American	0.5%	0.3%	1.1%	0.4%	0.8%
Native Hawaiian or Other Pacific Islander	0.2%	0%	0.5%	0.4%	0%
White	61.1%	65.0%	53.2%	68.2%	53.1%
US Citizenship					
US Citizen	46.3%	47.4%	43.2%	82.9%	5.1%
Non-US Citizen	53.7%	52.6%	56.8%	17.1%	94.9%
English Language					
English is first language	50.9%	53.5%	45.5%	83.3%	14.0%
English is not first language	49.1%	46.5%	54.5%	16.7%	86.0%
Disability					
Disability	1.6%	1.8%	0.6%	2.6%	0.4%
No disability	98.4%	98.2%	99.4%	97.4%	99.6%
Sexual Orientation					
Heterosexual	90.1%	89.7%	92.5%	89.6%	91.5%
Bisexual	4.9%	4.0%	6.9%	6.3%	3.0%
Gay or lesbian	4.3%	6.4%	0.6%	3.0%	5.6%
Relationship Status					
Single	31.3%	31.3%	30.9%	32.1%	30.1%
Casual	3.7%	4.3%	2.9%	4.1%	3.4%
Dating	9.3%	10.3%	7.4%	6.3%	12.3%
Long-term/Committed	36.4%	34.3%	40.6%	39.2%	33.5%
Married	18.7%	19.5%	17.1%	17.2%	20.8%
Divorced	0%	0%	0%	0%	0%
Other	0.6%	0.3%	1.1%	1.1%	0%
Living Alone					
Living alone	28.4%	28.0%	28.2%	24.1%	32.2%
Not living alone	71.6%	72.0%	71.8%	75.9%	67.8%
Children					
One or more	3.9%	4.3%	3.4%	3.7%	4.2%
None	96.1%	95.7%	96.6%	96.3%	95.8%
Undergrad institution					
Small liberal arts college (US)	11.0%	8.8%	14.7%	20.7%	0%
Public university (US)	12.7%	14.0%	10.2%	24.1%	0%
Private university (US)	29.2%	29.5%	28.2%	55.2%	0%
Non-U.S. university	46.5%	47.1%	46.3%	0%	100.0%
Other	0.6%	0.6%	0.6%	0%	0%

Table B.1: (Cont.) Student Background Statistics

	All	Male	Female	US Undergrad	Non-US Undergrad
Parental Relationship Status					
Never married	2.1%	1.5%	3.4%	0.4%	4.2%
Married	76.0%	75.8%	76.3%	79.3%	72.6%
Divorced or separated	18.8%	19.4%	17.5%	18.1%	19.0%
Other	3.1%	3.3%	2.8%	2.2%	4.2%
Father - Highest degree earned					
High school or below	9.2%	10.0%	8.0%	4.1%	14.4%
Associate	2.7%	3.0%	2.3%	1.5%	4.2%
Bachelor's	29.2%	30.9%	25.0%	24.4%	34.3%
Graduate degree	58.9%	56.1%	64.8%	70.0%	47.0%
Father - Graduate degrees					
MBA	13.3%	12.9%	14.2%	17.5%	5.9%
Other Master's	31.7%	32.7%	29.1%	26.9%	39.8%
MD	10.9%	12.4%	8.7%	9.4%	13.6%
JD	6.3%	7.9%	3.9%	7.1%	5.1%
Economics PhD	6.9%	5.9%	8.7%	6.6%	7.6%
Other PhD	27.8%	26.2%	30.7%	31.1%	22.0%
Other	3.0%	2.0%	4.7%	1.4%	5.9%
Mother - Highest degree earned					
High school or below	10.7%	12.1%	8.5%	5.2%	16.5%
Associate	6.6%	6.1%	7.9%	4.8%	8.4%
Bachelor's	33.8%	35.8%	30.5%	30.7%	37.1%
Graduate degree	48.8%	46.1%	53.1%	59.3%	38.0%
Mother - Graduate degrees					
MBA	10.4%	10.3%	10.0%	10.9%	9.5%
Other Master's	46.5%	48.5%	42.0%	47.7%	44.2%
MD	13.0%	13.9%	12.0%	12.6%	13.7%
JD	4.8%	4.8%	5.0%	4.6%	5.3%
Economics PhD	2.2%	1.8%	3.0%	2.9%	1.1%
Other PhD	20.1%	17.0%	26.0%	18.4%	23.2%
Other	3.0%	3.6%	2.0%	2.9%	3.2%
Math courses btw. start of undergrad & PhD					
0	2.9%	2.1%	4.5%	2.6%	3.4%
1 or 2	6.5%	6.4%	6.2%	4.5%	8.5%
3 or 4	18.6%	17.9%	20.5%	19.7%	17.4%
5 or 6	19.4%	17.3%	23.3%	17.5%	21.6%
7+	52.5%	56.2%	45.5%	55.8%	49.2%
Straight from undergraduate to PhD?					
Yes	24.3%	23.5%	26.0%	29.7%	18.1%
No	75.7%	76.5%	74.0%	70.3%	81.9%
Positions for compensation in the last two months					
Teaching Assistant	34.3%	33.9%	34.8%	28.7%	40.1%
Research Assistant	22.1%	23.3%	20.4%	22.2%	22.4%
Grader	6.1%	6.1%	6.3%	5.1%	7.4%
Resident Assistant	0.9%	1.2%	0.5%	0.9%	1.0%
Private tutor	6.3%	6.4%	6.3%	7.5%	5.1%
Non-academic data scientist	0.9%	0.9%	0.9%	1.2%	0.6%
Other	5.2%	5.4%	4.5%	6.0%	4.2%
Did not work for compensation	24.1%	22.8%	26.2%	28.4%	19.2%

Table B.2: Pearson correlations of Depression (PHQ-9) score and other outcomes

Measure	Depression (PHQ-9)
Anxiety (GAD-7)	0.655 ***
Suicidality 2-weeks (PHQ-9 Final Q)	0.511 ***
Suicidality 1-year (SBQR)	0.304 ***
Loneliness (UCLA-3)	0.482 ***
Self-Esteem (Rosenberg)	-0.585 ***
Impostor Syndrome (Clance)	0.379 ***
Eating Disorder (ESP)	0.264 ***
ADHD	0.280 ***
Alcohol Use (AUDIT-C)	0.012
Physical Exercise, Moderate	-0.015
Sleep (Good Days)	-0.418 ***
Sleepiness	0.379 ***

Note: Higher scores mean worse outcomes, except for Self-Esteem (higher score=higher self-esteem), Physical Exercise (higher score=more exercise), and Sleep (higher score=more good days of sleep). * = $p<0.1$, ** = $p<0.05$, *** = $p<0.01$.

Table B.3: How important are the following to your sense of success in life?

Panel A: Experiences

Question and Answer	Number	Percent
Tenure at an academic institution		
Not important at all	72	14.1%
Somewhat important	143	28.0%
Moderately important	168	32.9%
Very important	128	25.0%
Tenure at a top-ranked academic institution		
Not important at all	130	25.3%
Somewhat important	189	36.8%
Moderately important	130	25.3%
Very important	64	12.5%
High income		
Not important at all	49	9.6%
Somewhat important	191	37.3%
Moderately important	194	37.9%
Very important	78	15.2%
Having your own family		
Not important at all	30	5.9%
Somewhat important	67	13.1%
Moderately important	111	21.7%
Very important	303	59.3%
Knowing that you have made a useful contribution to the world		
Not important at all	20	3.9%
Somewhat important	52	10.1%
Moderately important	146	28.5%
Very important	295	57.5%
Recognition of your work by the general public		
Not important at all	83	16.2%
Somewhat important	180	35.1%
Moderately important	175	34.1%
Very important	75	14.6%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
Tenure at an academic institution	-0.094 **	-0.064	-0.005	-0.093 **
sig	0.036	0.150	0.914	0.036
n	502	508	510	509
Tenure at a top-ranked academic institution	-0.046	-0.098 **	0.009	0.004
sig	0.299	0.027	0.842	0.936
n	504	510	512	511
High income	0.069	0.012	0.048	0.055
sig	0.122	0.791	0.275	0.212
n	503	509	511	510
Having your own family	-0.084 *	0.001	-0.047	-0.033
sig	0.059	0.990	0.289	0.455
n	503	508	511	509
Knowing that you have made a useful contribution to the world	-0.036	-0.032	-0.113 **	-0.050
sig	0.425	0.474	0.010	0.258
n	504	510	512	511
Recognition of your work by the general public	-0.022	-0.009	-0.029	0.055
sig	0.630	0.842	0.509	0.215
n	504	510	512	511

Note: A higher response value indicates greater importance to a respondent's sense of success in life. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = $p<0.1$, ** = $p<0.05$, *** = $p<0.01$.

Table B.4: Happiness with PhD program: experiences and correlations with mental health outcomes

Panel A: Experiences

Question and Answer	Number	Percent
Over last 2 weeks, # days seriously contemplated quitting PhD program		
0 days	398	77.6%
1 day	67	13.1%
2 days	20	3.9%
3 days or more	28	5.5%
How satisfied are you with your PhD experience (1=extremely dissatisfied, 10=extremely satisfied)?		
1	4	0.8%
2	10	2.0%
3	24	4.7%
4	34	6.6%
5	63	12.3%
6	73	14.3%
7	104	20.3%
8	131	25.6%
9	54	10.5%
10	15	2.9%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
Over last 2 weeks, # days seriously contemplated quitting PhD program	0.338 ***	0.314 ***	0.280 ***	0.274 ***
sig	0.000	0.000	0.000	0.000
n	504	510	512	511
How satisfied are you with your PhD experience (1=extremely dissatisfied, 10=extremely satisfied)?	-0.460 ***	-0.408 ***	-0.269 ***	-0.391 ***
sig	0.000	0.000	0.000	0.000
n	503	509	511	510

Note: A higher response value indicates more days seriously contemplating quitting the PhD program and more satisfaction. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = $p<0.1$, ** = $p<0.05$, *** = $p<0.01$.

Table B.5: Working with others: experiences and correlations with mental health outcomes

Panel A: Experiences

Question and Answer	Number	Percent
In 1st year, number of people worked with on problem sets		
Worked alone	144	29.0%
2 people	76	15.3%
3 people	163	32.8%
4+ people	114	22.9%
Co-authoring with other PhD student?		
Yes	182	36.7%
No	314	63.3%
Co-authoring with faculty member?		
Yes	194	39.1%
No	302	60.9%
Over the last 7 days, how many days did you work in the Economics Department?		
0 days	58	11.4%
1 day	27	5.3%
2 days	39	7.6%
3 days	49	9.6%
4 days	77	15.1%
5 days	143	28.0%
6 days	69	13.5%
7 days	49	9.6%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
In 1st year, number of people worked with on problem sets	-0.016	0.013	-0.030	-0.182 ***
sig	0.723	0.778	0.505	0.000
n	488	494	496	495
Co-authoring with other PhD student?	-0.078 *	0.020	-0.026	-0.130 ***
sig	0.085	0.656	0.568	0.004
n	487	493	495	494
Co-authoring with faculty member?	-0.074	0.012	-0.043	-0.130 ***
sig	0.102	0.787	0.336	0.004
n	487	493	495	494
Over the last 7 days, how many days did you work in the Economics Department?	-0.095 **	-0.021	-0.077 *	-0.165 ***
sig	0.033	0.638	0.084	0.000
n	502	508	510	509

Note: A higher response value indicates a larger group, one or more projects co-authored, and more days worked in the Economics Department. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = $p<0.1$, ** = $p<0.05$, *** = $p<0.01$.

Table B.6: Seminar environment: experiences and correlations with mental health

Panel A: Experiences

Question and Answer	Number	Percent
Comfortable voice a thought in a seminar setting?		
Not comfortable at all	182	35.5%
Somewhat comfortable	180	35.2%
Moderately comfortable	99	19.3%
Very comfortable	51	10.0%
How certain about high quality of thought before sharing it in seminar setting?		
Not certain at all	46	9.0%
Somewhat certain	70	13.6%
Moderately certain	134	26.1%
Very certain	263	51.3%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
Comfortable voice a thought in a seminar setting?	-0.162 ***	-0.115 ***	-0.057	-0.160 ***
sig	0.000	0.010	0.195	0.000
n	503	509	511	510
How certain about high quality of thought before sharing it in seminar setting?	0.056	0.044	-0.065	0.018
sig	0.207	0.323	0.140	0.690
n	504	510	512	511

Note: A higher response value indicates greater comfort and certainty. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = p<0.1, ** = p<0.05, *** = p<0.01.

Table B.7: As of right now, how comfortable would you be voicing a thought in a seminar setting?

	All	Male	Female	US Undergrad	Non-US Undergrad
Moderately/Very Comfortable	29.3%	34.8%	19.3%	30.5%	28.3%

Table B.8: As of right now, how certain would you have to be about the high quality of a thought before you voiced it in a seminar setting?

	All	Male	Female	US Undergrad	Non-US Undergrad
Moderately/Very Certain	77.4%	77.0%	77.4%	81.1%	73.8%

Table B.9: Impediments to meeting with faculty: experiences and correlations with mental health outcomes

Panel A: Experiences

Question and Answer	Number	Percent
Meetings are difficult to schedule		
Not significant at all	257	56.6%
Somewhat significant	121	26.7%
Moderately significant	50	11.0%
Very significant	26	5.7%
Meetings are too short		
Not significant at all	322	70.9%
Somewhat significant	94	20.7%
Moderately significant	31	6.8%
Very significant	7	1.5%
Meetings are not useful		
Not significant at all	318	70.4%
Somewhat significant	98	21.7%
Moderately significant	28	6.2%
Very significant	8	1.8%
Meetings are unpleasant		
Not significant at all	361	79.9%
Somewhat significant	55	12.2%
Moderately significant	26	5.8%
Very significant	10	2.2%
Fear of the consequences of a bad impression		
Not significant at all	147	32.3%
Somewhat significant	140	30.8%
Moderately significant	83	18.2%
Very significant	85	18.7%
Doubt about the quality of your ideas, questions, thoughts		
Not significant at all	114	24.8%
Somewhat significant	122	26.6%
Moderately significant	115	25.1%
Very significant	108	23.5%
Lack of progress on to-dos from previous meeting		
Not significant at all	137	30.1%
Somewhat significant	112	24.6%
Moderately significant	105	23.1%
Very significant	101	22.2%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
Meetings are difficult to schedule	0.105 **	0.062	0.042	0.103 **
sig	0.027	0.191	0.373	0.028
n	446	451	453	452
Meetings are too short	0.041	0.074	-0.021	0.096 **
sig	0.392	0.115	0.657	0.042
n	446	451	453	452
Meetings are not useful	0.178 ***	0.148 ***	0.131 ***	0.166 ***
sig	0.000	0.002	0.005	0.000
n	444	449	451	450
Meetings are unpleasant	0.314 ***	0.322 ***	0.258 ***	0.272 ***
sig	0.000	0.000	0.000	0.000
n	444	449	451	450
Fear of the consequences of a bad impression	0.285 ***	0.339 ***	0.151 ***	0.315 ***
sig	0.000	0.000	0.001	0.000
n	447	452	454	453
Doubt about the quality of your ideas, questions, thoughts	0.215 ***	0.238 ***	0.088 *	0.253 ***
sig	0.000	0.000	0.060	0.000
n	451	456	458	457
Lack of progress on to-dos from previous meeting	0.180 ***	0.195 ***	0.100 **	0.199 ***
sig	0.000	0.000	0.033	0.000
n	447	452	454	453

Note: A higher response value indicates greater significance for each impediment. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = p<0.1, ** = p<0.05, *** = p<0.01.

Table B.10: Faculty attention and role modeling: experiences and correlations with mental health outcomes

Panel A: Experiences				
Question and Answer	Number	Percent		
Over last 2 months, # of faculty initiating informal conversation				
0	182	36.3%		
1	160	31.9%		
2	120	24.0%		
3 or more	39	7.8%		
# of faculty members in department you consider to be professional role models				
0	90	18.0%		
1	94	18.8%		
2	128	25.6%		
3 or more	188	37.6%		
Panel B: Pearson correlations with mental health outcomes				
Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
Over last 2 months, # of faculty initiating informal conversation	-0.109 **	-0.087 *	-0.085 *	-0.091 **
sig	0.016	0.053	0.058	0.043
n	492	498	500	499
# of faculty members in department you consider to be professional role models	-0.174 ***	-0.182 ***	-0.162 ***	-0.136 ***
sig	0.000	0.000	0.000	0.002
n	492	497	500	498

Note: A higher response value indicates more faculty informal conversations and more faculty professional role models. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = $p<0.1$, ** = $p<0.05$, *** = $p<0.01$.

Table B.11: How honest can you be with advisers about difficulties?: experiences and correlations with mental health outcomes

Panel A: Experiences		
Question and Answer	Number	Percent
How honest can you be with advisers about non-academic career options?		
Not honest at all	169	49.7%
Somewhat honest	77	22.6%
Moderately honest	58	17.1%
Very honest	36	10.6%
Research progress		
Not honest at all	135	38.7%
Somewhat honest	114	32.7%
Moderately honest	69	19.8%
Very honest	31	8.9%
Presentations		
Not honest at all	11	3.0%
Somewhat honest	68	18.8%
Moderately honest	114	31.6%
Very honest	168	46.5%
Teaching		
Not honest at all	11	4.0%
Somewhat honest	44	15.9%
Moderately honest	88	31.8%
Very honest	134	48.4%
Refereeing		
Not honest at all	6	3.6%
Somewhat honest	21	12.4%
Moderately honest	53	31.4%
Very honest	89	52.7%
Co-authoring with other students		
Not honest at all	16	6.0%
Somewhat honest	51	19.2%
Moderately honest	84	31.6%
Very honest	115	43.2%
Your mental health		
Not honest at all	142	41.5%
Somewhat honest	112	32.7%
Moderately honest	50	14.6%
Very honest	38	11.1%
Your other advisers		
Not honest at all	49	15.8%
Somewhat honest	102	32.9%
Moderately honest	80	25.8%
Very honest	79	25.5%
Preparing for the job market		
Not honest at all	11	4.1%
Somewhat honest	54	20.1%
Moderately honest	81	30.1%
Very honest	123	45.7%
Your decision to get a PhD in economics		
Not honest at all	69	22.6%
Somewhat honest	69	22.6%
Moderately honest	59	19.3%
Very honest	108	35.4%
Decisions related to starting a family		
Not honest at all	76	31.0%
Somewhat honest	74	30.2%
Moderately honest	48	19.6%
Very honest	47	19.2%
Co-authoring with these faculty		
Not honest at all	31	11.7%
Somewhat honest	72	27.3%
Moderately honest	72	27.3%
Very honest	89	33.7%
Other personal life issues		
Not honest at all	135	38.7%
Somewhat honest	114	32.7%
Moderately honest	69	19.8%
Very honest	31	8.9%

Table B.11: (Cont.) How honest can you be with advisers about difficulties?: experiences and correlations with mental health outcomes

Panel B: Pearson correlations with mental health outcomes				
Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
How honest can you be with advisers about non-academic career options?	-0.193 ***	-0.272 ***	-0.184 ***	-0.220 ***
sig	0.000	0.000	0.001	0.000
n	335	338	339	338
Research progress	-0.261 ***	-0.313 ***	-0.198 ***	-0.323 ***
sig	0.000	0.000	0.000	0.000
n	340	347	348	347
Presentations	-0.257 ***	-0.310 ***	-0.223 ***	-0.236 ***
sig	0.000	0.000	0.000	0.000
n	353	359	360	360
Teaching	-0.215 ***	-0.326 ***	-0.183 ***	-0.328 ***
sig	0.000	0.000	0.002	0.000
n	274	275	277	276
Refereeing	-0.290 ***	-0.344 ***	-0.252 ***	-0.273 ***
sig	0.000	0.000	0.001	0.000
n	166	169	169	169
Co-authoring with other students	-0.146 **	-0.191 ***	-0.235 ***	-0.252 ***
sig	0.018	0.002	0.000	0.000
n	262	264	266	265
Your mental health	-0.284 ***	-0.308 ***	-0.296 ***	-0.278 ***
sig	0.000	0.000	0.000	0.000
n	334	340	341	341
Your other advisers	-0.159 ***	-0.191 ***	-0.176 ***	-0.216 ***
sig	0.005	0.001	0.002	0.000
n	303	308	309	308
Preparing for the job market	-0.340 ***	-0.312 ***	-0.244 ***	-0.326 ***
sig	0.000	0.000	0.000	0.000
n	263	267	268	268
Your decision to get a PhD in economics	-0.293 ***	-0.271 ***	-0.195 ***	-0.269 ***
sig	0.000	0.000	0.001	0.000
n	298	304	304	304
Decisions related to starting a family	-0.234 ***	-0.239 ***	-0.133 **	-0.300 ***
sig	0.000	0.000	0.037	0.000
n	239	243	245	244
Co-authoring with these faculty	-0.248 ***	-0.244 ***	-0.217 ***	-0.230 ***
sig	0.000	0.000	0.000	0.000
n	258	262	264	263
Other personal life issues	-0.261 ***	-0.313 ***	-0.198 ***	-0.323 ***
sig	0.000	0.000	0.000	0.000
n	340	347	348	347

Note: A higher response value indicates greater ease of discussing non-academic career options and greater honesty with difficulties in each question category. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = p<0.1, ** = p<0.05, *** = p<0.01.

Table B.12: Symptom severity and mental health diagnoses

Panel A: Depression			
PHQ-9 Score	Category	Diagnosed Before	Diagnosed After
0 to 4	none-minimal	34.8%	27.9%
5 to 9	mild	39.4%	34.4%
10 to 14	moderate	16.7%	24.6%
15 to 19	moderately-severe	7.6%	9.8%
>=20	severe	1.5%	3.3%
Panel B: Anxiety			
GAD-7 Score	Category	Diagnosed Before	Diagnosed After
0 to 4	none-minimal	43.3%	36.1%
5 to 9	mild	34.3%	34.4%
10 to 14	moderate	17.9%	19.7%
>=15	severe	4.5%	9.8%
Panel C: Suicidality			
PHQ-9 Final Question Score	Category	Diagnosed Before	Diagnosed After
0	not at all	89.4%	80.3%
>= 1	more than zero days	10.6%	19.7%

Note: Table shows the percentage of students diagnosed with a mental health issue before starting the PhD program and percentage of students diagnosed after starting the PhD program who are scoring in each PHQ-9, GAD-7, and PHQ-9 Final Question category. Those who score 10 or higher on the PHQ-9 or the GAD-7 would, with a 90% probability, be diagnosed with depression or anxiety disorder, respectively, upon seeing a mental health professional. The PHQ-9 Final Question measures suicidality by asking on how many days over the past two weeks a student was bothered by suicidal thoughts.

Table B.13: Regrets and mental health

	PHQ-9	GAD-7	PHQ-9 Final Question	SBQR
Change area of study	9.06 (σ=5.75)	7.39 (σ=5.55)	0.28 (σ=0.45)	4.65 (σ=2.63)
Change adviser(s)	8.03 (σ=6.25)	7.65 (σ=5.59)	0.20 (σ=0.40)	4.23 (σ=2.77)
Not pursue a PhD at all	8.64 (σ=5.06)	7.68 (σ=4.79)	0.27 (σ=0.44)	4.54 (σ=2.52)
Engage more with study	6.47 (σ=4.51)	5.19 (σ=4.07)	0.11 (σ=0.32)	3.68 (σ=2.38)
Study at another institution	7.98 (σ=6.13)	6.54 (σ=4.43)	0.24 (σ=0.43)	4.55 (σ=2.30)
Organize time more effectively	6.24 (σ=4.50)	5.39 (σ=4.23)	0.11 (σ=0.31)	3.62 (σ=2.20)
Nothing	4.31 (σ=4.12)	4.23 (σ=3.98)	0.07 (σ=0.26)	3.51 (σ=2.36)
Other	5.91 (σ=4.52)	5.58 (σ=4.30)	0.09 (σ=0.28)	3.77 (σ=2.26)
ANOVA Test Statistic	6.72	5.16	3.92	2.62
p-value	0.000	0.000	0.000	0.011

Note: Table shows mean scores on screens for depression (PHQ-9), anxiety (GAD-7), suicidal ideation in the last 2 weeks (PHQ-9 Final Question), and suicidal ideation in the last year (SBQR). PHQ-9 and GAD-7 scores range from 1 (least severe) to 20+ (most severe). Mental health professionals use a score of 10 as a cutoff when diagnosing individuals with depression (PHQ-9) or anxiety disorder (GAD-7). A score of 7 or above on the SBQR reflects elevated risk of suicide. PHQ-9 Final Question numbers show shares of students reporting suicidal ideation on at least several days in the past 2 weeks. Standard deviations are in parentheses. Table columns show answer options students had to the question: What would you do differently right now if you were starting your program? ANOVA test statistics and p-values for comparisons of student means between answer choices are also shown.

Table B.14: In this academic year, how successful do you think you will be...: experiences and correlations with mental health outcomes

Panel A: Experiences

Question and Answer	Number	Percent
in your courses		
Not successful at all	23	8.2%
Somewhat successful	60	21.3%
Moderately successful	144	51.1%
Very successful	55	19.5%
in your research process		
Not successful at all	39	8.3%
Somewhat successful	184	39.2%
Moderately successful	196	41.8%
Very successful	50	10.7%
in your presentations		
Not successful at all	42	10.3%
Somewhat successful	124	30.5%
Moderately successful	193	47.5%
Very successful	47	11.6%
in your teaching		
Not successful at all	11	3.9%
Somewhat successful	58	20.4%
Moderately successful	135	47.4%
Very successful	81	28.4%

Panel B: Pearson correlations with mental health outcomes

Question	PHQ-9	GAD-7	PHQ-9 Final Question	Loneliness
in your courses	-0.285 ***	-0.315 ***	-0.197 ***	-0.247 ***
sig	0.000	0.000	0.001	0.000
n	277	281	282	281
in your research process	-0.361 ***	-0.290 ***	-0.172 ***	-0.317 ***
sig	0.000	0.000	0.000	0.000
n	461	466	468	467
in your presentations	-0.325 ***	-0.259 ***	-0.158 ***	-0.317 ***
sig	0.000	0.000	0.001	0.000
n	399	404	405	404
in your teaching	-0.201 ***	-0.193 ***	-0.128 **	-0.266 ***
sig	0.001	0.001	0.031	0.000
n	280	283	284	284

Note: A higher response value indicates greater belief in success in each endeavor. Higher PHQ-9, GAD-7, PHQ-9 Final Question, and Loneliness scores reflect worse mental health. PHQ-9 captures depressive symptoms, GAD-7 captures anxious symptoms, PHQ-9 Final Question captures suicidal ideation, and Loneliness captures degree of loneliness and isolation. For exact question wording, see survey instrument in Appendix C1. * = $p<0.1$, ** = $p<0.05$, *** = $p<0.01$.

Appendix C1: 2017 Fall Student Survey

Note that you cannot return to the previous page.
Please do not use your browser navigation button to go back.

Overview & ID

Graduate Student Mental Health: A Study of American Economics Departments
Researchers: Paul Barreira, MD; Matthew Basilico; Valentin Bolotnyy

Consent Form

Participation is voluntary

It is your choice whether or not to participate in this research. If you choose to participate, you may change your mind and leave the study at any time. Refusal to participate or stopping your participation will involve no penalty or loss of benefits to which you are otherwise entitled.

What is the purpose of this research?

The purpose of this research is to understand the prevalence and severity of common mental health problems among graduate students in economics departments across the United States. In addition, the study will help identify environmental factors that may mitigate or contribute to mental health issues. A faculty survey portion of the study will help supplement the graduate student study by shedding additional light on faculty-student relationships.

What can I expect if I take part in this research?

The study is intended for economics graduate students in all years of the PhD program.

The initial survey will take 20 to 25 minutes to complete. A follow-up survey will be sent to you in the Spring of 2018 and will take about 10 minutes to complete. At the end of each survey, you will receive scores on the clinically validated mental health screens and explanations for what those scores mean about your mental health.

Once you begin a survey you will not be able to leave it and return to it at another time, so please complete it in one sitting. There is also no "Back" button, so you cannot change responses once you proceed to the next page.

The researchers will produce an aggregated report across all participating economics programs, as well as an aggregated report specifically for your department. Data from your department will only be studied in an aggregated way and the researchers will share department-specific results only with your

department Chair. The report aggregated across all participating programs will not identify department-specific results.

What are the risks and possible discomforts?

If you choose to participate, answering questions that require reflection on issues related to your mental health and potentially distressing past experiences has some psychological risk. If you become upset or feel any distress when you are responding to these questions, please call your university's mental health services. The National Suicide Prevention Lifeline is another resource that is available 24 hours a day at 1-800-273-8255.

Benefits

We cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include an improved understanding of your own mental health and its connection to your life experiences; structural department-level and profession-level reforms that improve student and faculty quality of life; improved departmental culture around mental health; initiatives across graduate programs worldwide to improve mental health among students and faculty.

If I take part in this research, how will my privacy be protected? What happens to the information you collect?

The data we collect will be stored on a secure server and analyzed in an anonymous way. No raw, individual response-level data will ever be made public. Such data will also not be handled or accessed by anyone other than a third-party data scientist hired by the researchers. The data scientist has no affiliation with any economics department and has signed a confidentiality agreement. No attempt will ever be made to identify whether or how specific individuals answered the questions in this study.

The ID provided to you for access to each survey is intended to ensure that you only complete each survey once and to allow the researchers to see how graduate student mental health changes over time across all participating programs and in your department. Data matching the ID to you will be stored on a separate secure server from the data set with your survey responses and will only be used for the purpose of this study, as described above.

If I have any questions, concerns, or complaints about this research study, who can I talk to?

The lead researcher for this study is *Paul Barreira, MD* who can be reached at 671-495-2010; 75 Mt. Auburn Street, Cambridge, MA 02138; gradsurvey@huhs.harvard.edu .

Please contact him if you have questions, concerns, complaints, or:

- If you would like to talk to the research team,

- If you think the research has harmed you, or
- If you wish to withdraw from the study.

This research has been reviewed by the Committee on the Use of Human Subjects in Research at Harvard University. The Committee can be reached at 617-496-2847, 1350 Massachusetts Avenue, 9th Floor, Suite 935, Cambridge, MA 02138, or cuhs@harvard.edu for any of the following:

- If your questions, concerns, or complaints are not being answered by the research team,
- If you cannot reach the research team,
- If you want to talk to someone besides the research team, or
- If you have questions about your rights as a research participant.

Statement of Consent

I have read the information in this consent form. All my questions about the research have been answered to my satisfaction.

Click here to download consent form PDF

Signature

By selecting this box, I consent to taking part in this research.

Please note that refreshing the survey or using your browser navigation button to go back will invalidate the survey.

Please enter the survey ID number provided in the e-mail:

PHQ-9

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
Little interest or pleasure in doing things	O	O	O	O
Feeling down, depressed, or hopeless	O	O	O	O
Trouble falling or staying asleep, or sleeping too much	O	O	O	O
Feeling tired or having little energy	O	O	O	O

	Not at all	Several days	More than half the days	Nearly every day
Poor appetite or overeating	O	O	O	O
Feeling bad about yourself - or that you are a failure or have let yourself or your family down	O	O	O	O
Trouble concentrating on things, such as reading the newspaper or watching television	O	O	O	O
Moving or speaking so slowly that other people could have noticed. Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual	O	O	O	O
Thoughts that you would be better off dead or of hurting yourself in some way	O	O	O	O

How difficult have these problems made it for your to do your work, take care of things at home, or get along with other people?

Not difficult at all | Somewhat difficult | Very difficult | Extremely difficult

GAD-7

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly everyday
Feeling nervous, anxious or on edge	O	O	O	O
Not being able to stop or control worrying	O	O	O	O
Worrying too much about different things	O	O	O	O
Trouble relaxing	O	O	O	O
Being so restless that it is hard to sit still	O	O	O	O
Becoming easily annoyed or irritable	O	O	O	O
Feeling afraid as if something awful might happen	O	O	O	O

How difficult have these problems made it for your to do your work, take care of things at home, or get along with other people?

Not difficult at all | Somewhat difficult | Very difficult | Extremely difficult

SBQ-R Suicide Behaviors Questionnaire-Revised

Have you ever thought about or attempted to kill yourself?

Never

It was just a brief passing thought

I have had a plan at least once to kill myself but did not try to do it

I have had a plan at least once to kill myself and really wanted to die

I have attempted to kill myself, but did not want to die

I have attempted to kill myself, and really hoped to die

How often have you thought about killing yourself in the past year?

Never

Rarely (1 time)

Sometimes (2 times)

Often (3-4 times)

Very Often (5 or more times)

Have you ever told someone that you were going to commit suicide, or that you might do it?

No

Yes, at one time, but did not really want to die

Yes, at one time, and really wanted to die

Yes, more than once, but did not want to do it

Yes, more than once, and really wanted to do it

How likely is it that you will attempt suicide someday?

Never

No chance at all

Rather unlikely

Unlikely

Likely

Rather likely

Very likely

Self Esteem, Rosenberg Self-Esteem Scale

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

	Strongly Agree	Agree	Disagree	Strongly Disagree
On the whole, I am satisfied with myself.	O	O	O	O
At times I think I am no good at all.	O	O	O	O
I feel that I have a number of good qualities.	O	O	O	O
I am able to do things as well as most other people.	O	O	O	O
I feel I do not have much to be proud of.	O	O	O	O
I certainly feel useless at times.	O	O	O	O
I feel that I am a person of worth, at least on an equal plane with others.	O	O	O	O
I wish I could have more respect for myself.	O	O	O	O
All in all, I am inclined to feel that I am a failure.	O	O	O	O
I take a positive attitude toward myself.	O	O	O	O

Imposter Phenomenon (IP)

For each question, please check the box that best indicates how true the statement is of you. It is best to give the first response that enters your mind rather than dwelling on each statement and thinking about it over and over.

	Not at all true	Rarely true	Sometimes true	Often true	Very true
I can give the impression that I'm more competent than I really am.	O	O	O	O	O
I'm afraid people important to me may find out that I'm not as capable as they think I am.	O	O	O	O	O
I often compare my ability to those around me and think they may be more intelligent than I am.	O	O	O	O	O
Sometimes I'm afraid others will discover how much knowledge or ability I really lack.	O	O	O	O	O

	Not at all true	Rarely true	Sometimes true	Often true	Very true
I feel bad and discouraged if I'm not "the best" or at least "very special" in situations that involve achievement.	O	O	O	O	O
I feel confident in my abilities as a researcher.	O	O	O	O	O
I feel confident in my abilities in math.	O	O	O	O	O
I feel that I am at the same level of technical ability as my peers.	O	O	O	O	O

EPS (Eating Disorder Screening Tool for Primary Care)

Please answer the following questions:

	Yes	No
Are you satisfied with your eating patterns?	O	O
Do you ever eat in secret?	O	O
Does your weight affect the way you feel about yourself?	O	O
Have any members of your family suffered with an eating disorder?	O	O
Do you currently suffer with or have you ever suffered in the past with an eating disorder?	O	O

Adult Self-Report Scale -VI.I (ASRS-VI.I) Screener (ADHD)

Check the box that best describes how you have felt and conducted yourself over the past 6 months.

	Never	Rarely	Sometimes	Often	Very Often
How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?	O	O	O	O	O
How often do you have difficulty getting things in order when you have to do a task that requires organization?	O	O	O	O	O
How often do you have problems remembering appointments or obligations?	O	O	O	O	O
When you have a task that requires a lot of thought, how often do you avoid or delay getting started?	O	O	O	O	O

	Never	Rarely	Sometimes	Often	Very Often
How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?	O	O	O	O	O
How often do you feel overly active and compelled to do things, like you were driven by a motor?	O	O	O	O	O

Question on feeling overwhelmed

Over the last 7 days, on how many days did you feel overwhelmed by the work you had to do?

0-1 days 2-3 days 4-5 days 6-7 days

Exercise

On how many of the past 7 days did you:

	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
Do moderate-intensity cardio or aerobic exercise (caused a noticeable increase in heart rate, such as a brisk walk) for at least 30 minutes?	O	O	O	O	O	O	O	O
Do vigorous-intensity cardio or aerobic exercise (caused large increase in breathing or heart rate, such as jogging) for at least 20 minutes?	O	O	O	O	O	O	O	O
Do 8-10 strength training exercises (such as resistance weight machines) for 8-12 repetitions each?	O	O	O	O	O	O	O	O

AUDIT-C

How often do you have a drink containing alcohol?

Never Monthly or less 2-4 times per month 2-3 times per week 4+ times per week

How many units of alcohol do you drink on a typical day when you are drinking?

1-2 3-4 5-6 7-9 10+

If female: how often have you had 6 or more units on a single occasion in the last year?
If male: how often have you had 8 or more units on a single occasion in the last year?

Never Less than monthly Monthly Weekly Daily or almost daily

Sleep

On how many of the past 7 days did you get enough sleep so that you felt rested when you woke up in the morning?

0 days 1 day 2 days 3 days 4 days 5 days 6 days 7 days

People sometimes feel sleepy during the daytime. In the past 7 days, how much of a problem have you had with sleepiness (feeling sleepy, struggling to stay awake) during your daytime activities?

No problem at all
A little problem
More than a little problem
A big problem
A very big problem

Mental Health Diagnosis & Treatment

How would you rate your mental health overall?

Poor
Fair
Good
Excellent

Do you think your mental health is better or worse than the mental health of the average PhD student in your department?

Better
Worse

If you ever feel that you are experiencing a mental health issue, would you know where to turn for help?

Yes
No

If you ever feel that you are experiencing a mental health issue, how likely would you be to turn to someone for help?

Not likely
Somewhat likely
Moderately likely
Very likely

If you had an issue with mental health in the last 2 months, to whom did you turn for help? (Select all that apply)

Mental health professional(s) at your university
Mental health professional(s) outside of your university
Department staff member(s)
Department faculty member(s)
Family member(s)
Friend(s) in the department
Friend(s) outside of the department
Did not turn to anyone for help

How helpful were the mental health professional(s) at your university with addressing your mental health issue?

Not helpful

Somewhat helpful

Moderately helpful

Very helpful

How helpful were the mental health professional(s) outside of your university with addressing your mental health issue?

Not helpful

Somewhat helpful

Moderately helpful

Very helpful

How helpful were the department staff member(s) with addressing your mental health issue?

Not helpful

Somewhat helpful

Moderately helpful

Very helpful

How helpful were the department faculty member(s) with addressing your mental health issue?

Not helpful

Somewhat helpful

Moderately helpful

Very helpful

How helpful were the family member(s) with addressing your mental health issue?

Not helpful

Somewhat helpful

Moderately helpful

Very helpful

How helpful were the friend(s) in the department with addressing your mental health issue?

Not helpful

Somewhat helpful

Moderately helpful

Very helpful

How helpful were the friend(s) outside of the department with addressing your mental health issue?

Not helpful

Somewhat helpful

Moderately helpful

Very helpful

Were you diagnosed by a mental health professional with any mental health issue(s) prior to starting this PhD program?

Yes

No

Have you been diagnosed by a mental health professional with any mental health issue(s) after you started this PhD program?

Yes

No

Are you currently receiving treatment for:

	Yes	No
Depression	○	○
Anxiety	○	○
Any other mental health issue	○	○

Personal

About how many people do you have in your personal life that you can really open up to about your most private feelings without having to hold back?

0

1

2 - 5

6 - 10

11 - 15

16 - 20

More than 20

When you have a problem or worry, how often do you let someone in your personal life know about it?

Never Sometimes Most of the Time Always

I have very good friends at my Economics Department.

Strongly agree

Agree

Neither agree nor disagree

Disagree

Strongly disagree

The following questions address how you feel about different aspects of your life. For each question, please tell us how often you feel that way.

	Hardly Ever	Some of the Time	Often
How often do you feel you lack companionship?	○	○	○
How often do you feel left out?	○	○	○
How often do you feel isolated from others?	○	○	○

Over the last 7 days, how many hours per day did you typically spend on a leisure activity unrelated to the PhD program?

0

1

2

3 or more

Over the last 7 days, how many times per day did you typically check Facebook?

0

1

2

3 or more

Don't have a Facebook account

Over the last 2 weeks:

	Yes	No
Has a significant other, friend, or family member experienced a significant negative life event?	O	O
Have you experienced a significant negative life event?	O	O

How important are the following to your sense of success in life?

	Not important at all	Somewhat important	Moderately important	Very important
Tenure at an academic institution	O	O	O	O
Tenure at a top-ranked academic institution	O	O	O	O
High income	O	O	O	O
Having your own family	O	O	O	O
Knowing that you have made a useful contribution to the world	O	O	O	O
Recognition of your work by the general public	O	O	O	O

Academic Performance

In this academic year, how successful do you think you will be ... ?

	Not successful at all	Somewhat successful	Moderately successful	Very successful	Not applicable
in your courses	O	O	O	O	O
in your research process	O	O	O	O	O
in your presentations	O	O	O	O	O
in your teaching	O	O	O	O	O

As of right now, how comfortable would you be voicing a thought in a seminar setting?

Not comfortable at all

Somewhat comfortable

Moderately comfortable

Very comfortable

As of right now, how certain would you have to be about the high quality of a thought before you voiced it in a seminar setting?

Not certain at all

Somewhat certain

Moderately certain

Very certain

As of right now, how competitive do you think your peers are with each other?

Not competitive at all

Somewhat competitive

Moderately competitive

Very competitive

If you are a 2nd year student or above, please answer the following: What was the average of your grades in the first-year Microeconomic Theory and Macroeconomic Theory courses?

A

A/A-

A-

A-/B+

B+

B+/B

B

B/B-

B-

Lower than B-

During your 1st year in the PhD program, how large was the group (including yourself) in which you typically found yourself working on problem sets? Please respond even if you are currently a 1st year student.

Worked alone

2 people

3 people

4+ people

As of right now, do you have one or more projects that you are co-authoring with another PhD student?

Yes

No

As of right now, do you have one or more projects that you are co-authoring with a faculty member?

Yes

No

In general, how often does your work provide you with the following:

	Always	Most of the time	Sometimes	Rarely	Never	Don't Know
Opportunities to fully use your talents	O	O	O	O	O	O
Opportunities to make positive impact on community/society	O	O	O	O	O	O
Sense of personal accomplishment	O	O	O	O	O	O
Goals to aspire to	O	O	O	O	O	O
Satisfaction of work well done	O	O	O	O	O	O
Feeling of doing useful work	O	O	O	O	O	O

Thinking about both your commitments at work and outside of work, please select the response which best describes your situation. How often, in the last 3 months, has it happened that you:

	Always	Most of the time	Sometimes	Rarely	Never
Worried about work when not working	O	O	O	O	O
Were too tired for activities in private life	O	O	O	O	O
Were too tired to do household jobs	O	O	O	O	O
Had difficulty making ends meet financially	O	O	O	O	O
Had work prevent time with family or significant others	O	O	O	O	O

Over the last 2 weeks, on how many days did you seriously contemplate quitting the PhD program?

0 days

1 day

2 days

3 days or more

Academic Field

What year are you in your program?

1st 2nd 3rd 4th 5th 6th 7th+

What do you consider to be your primary field?

What do you consider to be your secondary field, if you have one?

On a scale of 1 to 10, where 1 = Extremely dissatisfied and 10 = Extremely satisfied, how satisfied are you with your PhD experience?

1 2 3 4 5 6 7 8 9 10

What would you do differently right now if you were starting your program? Please select as many as apply.

Change area of study
Change adviser(s)
Not pursue a PhD at all
Study at another institution
Engage more with study
Organize time more effectively
Nothing
Other

On average, how many hours a week do you typically work?

Less than 11 hours | 11-20 hours | 21-30 hours | 31-40 hours | 41-50 hours | 51-60 hours | 61-70 hours | 71-80 hours | More than 80 hours

Over the last 7 days, how many days did you work in the Economics Department?

0 days 1 day 2 days 3 days 4 days 5 days 6 days 7 days

Over the last 2 months, have you been physically away from your department for 1 month or longer?

Yes

No

Advising

Think of your Economics Department faculty members with whom you've met in the last 2 months:

From your impressions, how much do they care about the success of your research project(s)?

Do not care at all

Care somewhat

Care moderately

Care very much

Not applicable/have not met with faculty in the last 2 months

From your impressions, how much do they care about you as a person?

Do not care at all

Care somewhat

Care moderately

Care very much

Not applicable/have not met with faculty in the last 2 months

How easy is it for you to talk to them about non-academic career options?

Not easy at all

Somewhat easy

Moderately easy

Very easy

Not applicable/have not met with faculty in the last 2 months

Think of your Economics Department faculty members with whom you've met in the last 2 months:

How honest can you be with them about the difficulties you face with:

	Not honest at all	Somewhat honest	Moderately honest	Very honest	Not applicable/have not met with faculty in the last 2 months
Research progress	○	○	○	○	○
Presentations	○	○	○	○	○
Teaching	○	○	○	○	○
Refereeing	○	○	○	○	○
Co-authoring with other students	○	○	○	○	○
Co-authoring with these faculty	○	○	○	○	○
Your other advisers	○	○	○	○	○
Preparing for the job market	○	○	○	○	○
Your decision to get a PhD in economics	○	○	○	○	○
Decisions related to starting a family	○	○	○	○	○
Your mental health	○	○	○	○	○
Other personal life issues	○	○	○	○	○

Think of your Economics Department faculty members with whom you've met in the last 2 months:

How honest would you like to be with them about the difficulties you face with:

	Not honest at all	Somewhat honest	Moderately honest	Very honest	Not applicable/have not met with faculty in the last 2 months
Research progress	○	○	○	○	○
Presentations	○	○	○	○	○
Teaching	○	○	○	○	○
Refereeing	○	○	○	○	○
Co-authoring with other students	○	○	○	○	○
Co-authoring with these faculty	○	○	○	○	○
Your other advisers	○	○	○	○	○
Preparing for the job market	○	○	○	○	○
Your decision to get a PhD in economics	○	○	○	○	○
Decisions related to starting a family	○	○	○	○	○

	Not honest at all	Somewhat honest	Moderately honest	Very honest	Not applicable/have not met with faculty in the last 2 months
Your mental health	O	O	O	O	O
Other personal life issues	O	O	O	O	O

How easy would you like it to be for you to talk to them about non-academic career options?

Not easy at all

Somewhat easy

Moderately easy

Very easy

Not applicable/have not met with faculty in the last 2 months

In the last 2 months, how many times have you met with your:

Main adviser (the faculty member with whom you meet most frequently)	▼
Second adviser (the faculty member with whom you meet second-most frequently)	▼
Third adviser (the faculty member with whom you meet third-most frequently)	▼

As of right now, how significant are the following impediments for the frequency with which you meet with faculty?

	Not significant at all	Somewhat significant	Moderately significant	Very significant
Meetings are difficult to schedule	O	O	O	O
Meetings are too short	O	O	O	O
Meetings are not useful	O	O	O	O
Meetings are unpleasant	O	O	O	O
Fear of the consequences of a bad impression	O	O	O	O
Doubt about the quality of your ideas, questions, thoughts	O	O	O	O
Lack of progress on to-dos from previous meeting	O	O	O	O

Over the last 2 months, how many faculty members in your department initiated an informal conversation with you about how you were doing academically or personally?

0

1

2

3 or more

As of right now, how many faculty members in your department do you consider to be your professional role models?

0

1

2

3 or more

If you are a 2nd year student or above, please select the number of advisers you had last academic year who are:

No longer at the department

On leave this term only

On leave this academic year

Was one of the advisers who is no longer at the department or currently on leave your main adviser?

Yes

No

If you ever feel that you are experiencing an issue with advising, would you know where to turn for help?

Yes

No

If you ever feel that you are experiencing an issue with advising, how likely would you be to turn to someone for help?

Not likely

Somewhat likely

Moderately likely

Very likely

Background Questions

How old are you?

Younger than 20

20-24

25-29

30-34

35 or older

Which of the following races best describe(s) you: (Select all that apply)

American Indian or Alaska Native

Asian or Asian American

Hispanic or Latino

Black or African American

Native Hawaiian or Other Pacific Islander

White

Are you a U.S. citizen or permanent resident?

Yes

No

Is English your first language?

Yes

No

Which best describes your gender identity?

Man

Woman

Transgender

Other

Do you consider yourself to be:

Heterosexual

Bisexual

Gay or lesbian

Other

Do you have a disability?

Yes

No

How would you best describe your current relationship status?

Single

Casual

Dating

Long-term/Committed

Married

Divorced

Other

Do you live alone?

Yes

No

Do you have 1 or more children?

Yes

No

Are your parents:

Never married

Married

Divorced or separated

Other

Please indicate the highest degree earned by your father (biological or step). If you have multiple fathers, select the highest degree earned.

High school or below

Associate

Bachelor's

Graduate degree

Please indicate the graduate degree(s) earned by your father. (Select all that apply)

MBA
Other Master's
MD
JD
Economics PhD
Other PhD
Other

Please indicate the highest degree earned by your mother (biological or step). If you have multiple mothers, select the highest degree earned.

High school or below
Associate
Bachelor's
Graduate degree

Please indicate the graduate degree(s) earned by your mother. (Select all that apply)

MBA
Other Master's
MD
JD
Economics PhD
Other PhD
Other

Which of the following best describes your undergraduate institution?

Small liberal arts college (US)
Public university (US)
Private university (US)
Non-U.S. university
Other

How many math courses did you take between the start of your undergraduate study and the start of this PhD program?

0

1 or 2

3 or 4

5 or 6

7+

Did you go straight into this Economics PhD program after completing your undergraduate degree?

Yes

No

Over the last 2 months, what position(s) have you held for compensation? (Select all that apply)

Teaching Assistant

Grader

Research Assistant

Resident Assistant

Private tutor

Non-academic data scientist

Other

Did not work for compensation

Sexual Harassment

These next questions ask about situations in which a student, faculty member, staff member, or someone else associated with your Economics Department said or did something that:

- Interfered with your academic or professional performance,
- Limited your ability to participate in your academic program, or
- Created an intimidating, hostile or offensive social, academic or work environment

Check all that you have experienced since becoming a PhD student from a student, faculty member, staff member, or someone else associated with your Economics Department:

Sexual remarks, jokes, or stories that were insulting or offensive to you

Inappropriate or offensive comments about your or someone else's body, appearance, or sexual activities

Crude or gross sexual comments or tried to get you to talk about sexual matters when you did not want to

Email(s), text(s), phone call(s), or instant message(s) with offensive sexual remarks, jokes, stories, pictures, or videos that you did not want to receive

Requests to go out for dinner, have drinks, or have sex even though you said, "No"

At the time of this event/these events, what was the person's/were the persons' relationship(s) to you? (Select all that apply)

At the time, it was someone I was involved or intimate with

Someone I had been involved or was intimate with

Professor

Adviser

Staff member

Graduate student friend or acquaintance

Undergraduate student friend or acquaintance

Stranger

Other

Don't know

Appendix C2: 2017 Fall Faculty Survey

Note that you cannot return to the previous page.
Please do not use your browser navigation button to go back.

Overview & ID

Graduate Student Mental Health: A Study of American Economics Departments
Researchers: Paul Barreira, MD; Matthew Basilico; Valentin Bolotnyy

Consent Form

Participation is voluntary

It is your choice whether or not to participate in this research. If you choose to participate, you may change your mind and leave the study at any time. Refusal to participate or stopping your participation will involve no penalty or loss of benefits to which you are otherwise entitled.

What is the purpose of this research?

The purpose of this research is to understand the prevalence, severity, and correlates of common mental health problems among graduate students in economics departments across the United States. The faculty survey portion of the study will help supplement the graduate student study by shedding additional light on faculty-student relationships.

What can I expect if I take part in this research?

This survey should take about 5 minutes to complete. It is intended for all tenured or tenure-track faculty in Economics.

Once you begin the survey you will not be able to leave it and return to it at another time, so please complete it in one sitting. There is also no "Back" button, so you cannot change responses once you proceed to the next page.

The researchers will produce an aggregated report across all participating economics programs, as well as an aggregated report specifically for your department. Data from your department will only be studied in an aggregated way and the researchers will share department-specific results only with your department Chair. The report aggregated across all participating programs will not identify department-specific results.

What are the risks and possible discomforts?

Answering questions that require reflection on interactions with students and colleagues, as well as on the environment in the department, may cause discomfort. Your thoughtful and honest responses are important to us, but if you are uncomfortable answering a certain question, please feel free to skip that question.

Benefits

We cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include students' improved understanding of their own mental health and its connection to their life experiences; structural department-level and profession-level reforms that improve student and faculty quality of life; improved departmental culture around mental health; initiatives across graduate programs worldwide to improve mental health among students and faculty.

If I take part in this research, how will my privacy be protected? What happens to the information you collect?

The data we collect will be stored on a secure server and analyzed in an anonymous way. No raw, individual response-level data will ever be made public. Such data will also not be handled or accessed by anyone other than a third-party data scientist hired by the researchers. The data scientist has no affiliation with any economics department and has signed a confidentiality agreement. No attempt will ever be made to identify whether or how specific individuals answered the questions in this study.

If I have any questions, concerns, or complaints about this research study, who can I talk to?

The lead researcher for this study is *Paul Barreira, MD* who can be reached at 671-495-2010; 75 Mt. Auburn Street, Cambridge, MA 02138; gradsurvey@huhs.harvard.edu .

Please contact him if you have questions, concerns, complaints, or:

- If you would like to talk to the research team,
- If you think the research has harmed you, or
- If you wish to withdraw from the study.

This research has been reviewed by the Committee on the Use of Human Subjects in Research at Harvard University. The Committee can be reached at 617-496-2847, 1350 Massachusetts Avenue, 9th Floor, Suite 935, Cambridge, MA 02138, or cuhs@harvard.edu for any of the following:

- If your questions, concerns, or complaints are not being answered by the research team,
- If you cannot reach the research team,
- If you want to talk to someone besides the research team, or

- If you have questions about your rights as a research participant.

Statement of Consent

I have read the information in this consent form. All my questions about the research have been answered to my satisfaction.

Consent Form PDF Download

Signature

By selecting this box, I consent to taking part in this research.

Please note that refreshing the survey or using your browser navigation button to go back will invalidate the survey.

Faculty

Think of the PhD students with whom you've met in the last 2 months:

How honest do you think they would be with you if they faced difficulties with:

	Not honest at all	Somewhat honest	Moderately honest	Very honest	Not applicable/did not meet with students
Research progress	O	O	O	O	O
Presentations	O	O	O	O	O
Teaching	O	O	O	O	O
Refereeing	O	O	O	O	O
Co-authoring with other students	O	O	O	O	O
Co-authoring with you	O	O	O	O	O
Their other advisers	O	O	O	O	O
Preparing for the job market	O	O	O	O	O
Their decision to get a PhD in economics	O	O	O	O	O
Their decisions related to starting a family	O	O	O	O	O
Their mental health	O	O	O	O	O
Their other personal life issues	O	O	O	O	O

How easy do you think it would be for them to talk to you about non-academic career options?

Not easy at all

Somewhat easy

Moderately easy

Very easy

Not applicable or did not meet with students

In what year of the Economics PhD program do you think the average student experiences the highest level of strain on his or her mental health?

1st 2nd 3rd 4th 5th 6th 7th+

Have you ever received training on a mental health-related topic?

Yes

No

Don't know

Have you ever advised PhD student(s) who were experiencing an issue with mental health at the time?

Yes

No

Don't know

If yes, approximately how many of such students have you advised?

What advice would you give to other faculty members who might be advising a PhD student with a mental health issue?

RAND American Working Conditions Survey

The following are standard questions based on the RAND American Working Conditions Survey:

In general, how often does your work provide you with the following:

	Always	Most of the time	Sometimes	Rarely	Never	Don't know
Opportunities to fully use your talents	O	O	O	O	O	O
Opportunities to make positive impact on community/society	O	O	O	O	O	O
Sense of personal accomplishment	O	O	O	O	O	O
Goals to aspire to	O	O	O	O	O	O
Satisfaction of work well done	O	O	O	O	O	O
Feeling of doing useful work	O	O	O	O	O	O

The following are standard questions based on the RAND American Working Conditions Survey:

Thinking about both your commitments at work and outside of work, please select the response which best describes your situation. How often, in the last 3 months, has it happened that you:

	Always	Most of the time	Sometimes	Rarely	Never
Worried about work when not working	O	O	O	O	O
Were too tired for activities in private life	O	O	O	O	O
Were too tired to do household jobs	O	O	O	O	O
Had difficulty making ends meet financially	O	O	O	O	O
Had work prevent time with family or significant others	O	O	O	O	O

I have very good friends at my Economics Department.

Strongly agree

Agree

Neither agree nor disagree

Disagree

Strongly disagree

What is your level of seniority in the department?

On tenure track

Tenured

Since receiving your PhD, for how many years have you held an academic position?