Graduate Student Mental Health
Lessons from American Economics Departments

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Road Map

1. Context
2. Study Overview
3. Mental Health Findings
4. Work Experiences & Mental Health
5. Recommendations

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Turning to a Biologist/Neurologist for Context

Robert Sapolsky

American neuroendocrinologist

profiles.stanford.edu/robert-sapolsky

Robert Morris Sapolsky is an American neuroendocrinologist and author. He is currently a professor of biology, and professor of neurology and neurological sciences and, by courtesy, neurosurgery, at Stanford University. In addition, he is a research associate at the National Museums of Kenya. Wikipedia

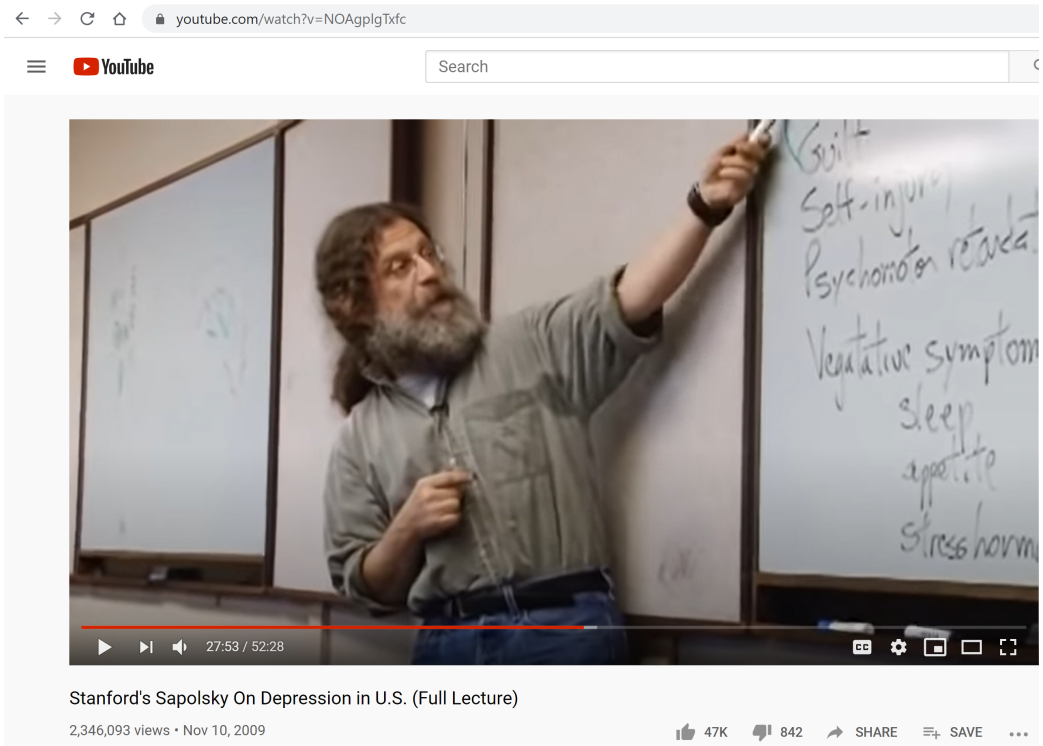
Born: April 6, 1957 (age 63 years), Brooklyn, New York, NY

Spouse: Lisa Sapolsky

Parents: Thomas Sapolsky

Education: John Dewey High School, The Rockefeller University, Harvard University

Awards: MacArthur Fellowship



What is Depression? More Info

- "When you want to come to the basic meat and potatoes of human medical misery, there is nothing out there like depression. Depression is absolutely crippling, depression is incredibly pervasive, and thus important to talk about. I'll make the argument here today that. . . basically, depression is like the worst disease you can get."
- "So what's a depression? You sit there and you think about kids in refugee camps, you think about the inevitable mortality of your loved ones, you think about whatever, and suddenly your body does the exact same thing as if you were gored by an elephant. . . on a certain totally simplistic level, what depression is about is the cortex whispering in the ear of the rest of the brain and saying: this is as real as if you were just physically assaulted by some sort of predator. . . the cortex having too many sad thoughts and getting the rest of the brain to go along with it."

What is Depression? (Continued)

- "Statistically, before their first major depressive episode, something awful, stressful occurs. . . have one of those first depressive episodes due to some stressful event, you come out the other side eventually, you are no more at risk for depression than anybody else. Along comes a second major stressor, and you fall into a depression, come out the other end, no more at risk than anyone else for depression. Somewhere around the fourth or fifth stress-induced depression, something happens and things start cycling on their own and you no longer need a major stressor to cause you to get depressed."

What is Depression? (Continued)

- "Depression is learned helplessness, it's taking a circumstance where by any logic you should be saying 'this was awful, but it's not the whole world' and [instead you] do this cognitive distortion and decide 'this is indeed the entire world and I have no control, I am always helpless, I am always hopeless.' This is the psychology of what a depression is about."
- "Depression is aggression turned inward."

What is Depression? (Continued)

- "The single thing I want to emphasize over and over. . . is this is not 'oh pull yourself together, we all get depressed'. This is as real of a biological disorder as diabetes. . . you should be no more inhibited about admitting that you've got something going on that's funny with this type of gene than you would be to admit that your pancreas isn't secreting insulin."

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Motivation and Objectives

Our motivation was a suicide in the MIT Economics PhD program

Objectives were to understand:

1. The prevalence and severity of mental health issues in Economics PhD programs
2. Student experiences in PhD programs
3. Potential connections between experiences and mental health

And to:

4. Make recommendations on steps programs can take to improve student mental health

Survey Structure

- Online (link sent by e-mail to students at 8 U.S. departments)
- Includes clinically validated instruments that measure prevalence and severity of mental health conditions
- Also includes questions on student academic, health, and personal backgrounds, as well as on experiences with peers, research, and advising in the department
- Student survey: Fall 2017 (25 min)
- Faculty survey: Fall 2017 (10 min)
- Student follow-up survey: Spring 2018 (10 min)

Basic Demographic Stats

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	131	55	42.0%	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	1138	513	45.1%	100.0%

Basic Demographic Stats

	Year in Graduate Program						
	G1	G2	G3	G4	G5	G6+	Total
Panel A: All Enrolled							
Number	223	190	175	206	172	172	1,138
Percent Female	28.7%	31.1%	26.3%	30.1%	27.9%	26.2%	28.4%
Percent U.S. Undergrad	52.0%	49.5%	52.0%	47.6%	46.0%	57.6%	50.8%
Percent Responded to Survey	44.4%	54.7%	44.0%	43.2%	47.7%	36.0%	45.1%
Panel B: Participants							
Number	99	104	77	89	82	60	511
Percent Female	38.4%	32.7%	33.8%	36.4%	37.0%	30.5%	34.7%
Percent U.S. Undergrad	57.6%	50.5%	54.5%	51.1%	48.8%	58.6%	53.5%

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Depression: Patient Health Questionnaire (PHQ-9)

- Commonly used. Threshold of $\geq$10: Sensitivity 88%; Specificity 88% (Kroenke et al 2001).

PHQ-9

Q485 Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
1. Little interest or pleasure in doing things (1)	❍	❍	❍	❍
2. Feeling down, depressed, or hopeless (2)	❍	❍	❍	❍
3. Trouble falling or staying asleep, or sleeping too much (3)	❍	❍	❍	❍
4. Feeling tired or having little energy (4)	❍	❍	❍	❍
5. Poor appetite or overeating (5)	❍	❍	❍	❍
6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down (6)	❍	❍	❍	❍
7. Trouble concentrating on things, such as reading the newspaper or watching television (7)	❍	❍	❍	❍
8. 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 (8)	❍	❍	❍	❍
9. Thoughts that you would be better off dead or of hurting yourself in some way (9)	❍	❍	❍	❍

PHQ-9: Depressive Symptoms

Alternative Estimates

PHQ-9 Score	Category	All	Male	Female	US Undergrad	Non-US Undergrad
0 - 4	Minimal depression	44.6%	47.4%	40.6%	45.9%	44.1%
5 - 9	Mild depression	37.7%	36.2%	41.1%	37.1%	38.5%
10 - 14	Moderate depression	11.9%	11.8%	12.0%	11.8%	12.2%
15 - 19	Moderately severe depression	4.4%	3.7%	4.6%	3.5%	4.4%
20 or greater	Severe depression	1.4%	0.9%	1.7%	1.7%	0.7%
>= 10	**Moderate or severe depression**	**17.7%**	**16.4%**	**18.3%**	**19.2%**	**15.5%**

Comparison to national incidence estimates:

- ***Our Survey:** **≥10: 17.7%**
- **20-39 year-olds: ≥10: 7.7% (CDC 2018)**
- **All ages: ≥10: 8.1% (CDC 2018)**
- **Harvard graduate students: ≥ 10: 21.6% (Dench et al. 2020)**

Anxiety: Generalized Anxiety Disorder (GAD-7)

- Commonly used. Threshold of $\geq$10: Sensitivity 89%; Specificity 82% (Spitzer et al 2006).

Q496 Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all (0)	Several days (1)	More than half the days (2)	Nearly everyday (3)
1. Feeling nervous, anxious or on edge (1)	❍	❍	❍	❍
2. Not being able to stop or control worrying (2)	❍	❍	❍	❍
3. Worrying too much about different things (3)	❍	❍	❍	❍
4. Trouble relaxing (4)	❍	❍	❍	❍
5. Being so restless that it is hard to sit still (5)	❍	❍	❍	❍
6. Becoming easily annoyed or irritable (6)	❍	❍	❍	❍
7. Feeling afraid as if something awful might happen (7)	❍	❍	❍	❍

GAD-7: Anxious Symptoms

Alternative Estimates

GAD-7 Score	Category	All	Male	Female	US Undergrad	Non-US Undergrad
0 - 4	No anxiety	51.2%	56.0%	43.5%	51.1%	52.2%
5 - 9	Mild anxiety	31.2%	28.1%	37.3%	32.6%	29.8%
10 - 14	Moderate anxiety	13.3%	12.2%	14.1%	12.4%	14.0%
15 or greater	Severe anxiety	4.3%	3.7%	5.1%	3.9%	4.0%
>= 10	**Moderate or severe anxiety**	**17.6%**	**15.9%**	**19.2%**	**17.9%**	**16.9%**

Comparison to national incidence estimates:

***Our Survey: $\geq$ 10: 17.6%**

Studies of US adults over last 25 years: $\geq$ 10: not more than 6%

Harvard graduate students: $\geq$ 10: 21.3% (Dench et al. 2020)

Suicidality

Alternative Estimates

PHQ-9

Q485 Over the last 2 weeks, how often have you been bothered by any of the following problems?

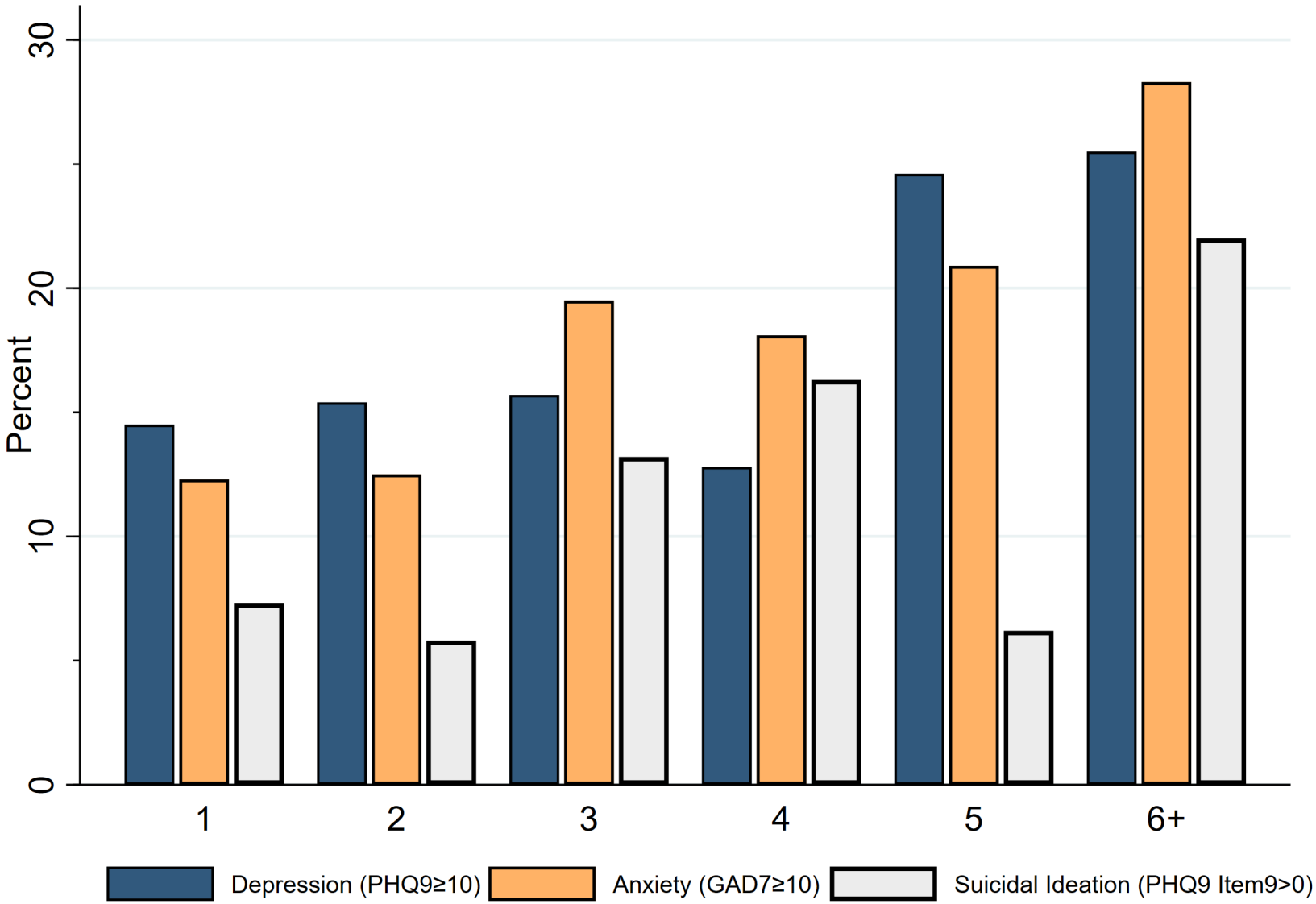
	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
9. Thoughts that you would be better off dead or of hurting yourself in some way (9)	○	○	○	○

"Cumulative risk of suicide attempt over one year increased from .4% among outpatients reporting thoughts of death or self-harm "not at all" to 4% among those reporting thoughts of death or self-harm "nearly every day."" (Simon et al. 2013)

Comparison, suicidal ideation:

***Our Survey: 11.3% (several days +), 1.4% (nearly every day)**
U.S. adults: 3.9% (at some point in past year) (CDC 2015)
U.S. adults ages 18-25: 7.4% (at some point in past year) (CDC 2015)

Mental Health Issues by Year in Program



Diagnoses & Treatment by Year in Program

	Year in Graduate Program						
	G1	G2	G3	G4	G5	G6+	Total
Diagnosed, pre-program	13.3%	11.5%	10.4%	20.2%	9.8%	13.3%	13.1%
Diagnosed, during program	0.0%	6.8%	9.1%	15.7%	19.5%	28.8%	11.9%
Of those w/moderate-severe depression or anxiety, % in treatment	14.3%	15.0%	26.3%	35.0%	33.3%	27.3%	25.2%

Comparison, mental illness diagnoses:

- ***Our Survey: 25%**
- **U.S. adults: 18.9% (Bose et al. 2018)**
- **U.S. adults ages 18-25 (group w/highest prevalence): 25.8% (Bose et al. 2018)**

Comparison, % of people w/serious symptoms in treatment:

- ***Our Survey: 25.2%**
- **Harvard graduate students: 41.4% (Dench et al. 2020)**
- **Adults in labor force: 50% (Kessler et al. 2008)**

Faculty Training and Advising Experiences

Question and Answer	Percent
Have you ever advised PhD student(s) who were experiencing an issue with mental health at the time?	
Yes	55.4%
No	22.6%
Don't know	22.0%
Have you ever received training on a mental health-related topic?	
Yes	15.6%
No	84.4%

Summary: Mental Health Findings

- Moderate-severe symptoms of depression, anxiety are 2-3X more prevalent among economics PhD students than in general population
- Suicidal ideation is 1.5X more prevalent than in highest risk group in general population
- Symptom prevalence among economics students is better than among other grad students, but...
- Econ students are half as likely to seek treatment when facing serious symptoms as other grad students
- Prevalence of serious symptoms is highest in final years of PhD: 23% of G6+ students experienced suicidal ideation

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Sources of Support

Question and Answer	Percent	PHQ-9 ρ	GAD-7 ρ	PHQ-9 Item 9 ρ
Number of people you can really open up to		**-0.203*** **	**-0.123*** **	**-0.232*** **
0	5.8%			
1	14.6%			
2 - 5	61.2%			
6 - 10	15.2%			
11 - 15	1.6%			
16 - 20	0.8%			
More than 20	0.8%			
How often share problem or worry?		**-0.182*** **	**-0.067**	**-0.162*** **
Never	3.3%			
Sometimes	48.4%			
Most of the Time	36.5%			
Always	11.7%			
I have very good friends at my Economics Department.		**-0.233*** **	**-0.144*** **	**-0.182*** **
Strongly agree	38.4%			
Agree	34.3%			
Neither agree nor disagree	14.8%			
Disagree	8.4%			
Strongly disagree	4.1%			
How competitive are your peers?		**0.222*** **	**0.272*** **	**0.143*** **
Not competitive at all	24.2%			
Somewhat competitive	41.6%			
Moderately competitive	23.0%			
Very competitive	11.1%			

Meaningfulness of Work Faculty

Question and Answer	Percent	PHQ-9 ρ	GAD-7 ρ	PHQ-9 Item 9 ρ
Opportunities to fully use your talents		**-0.364*** **	**-0.240*** **	**-0.187*** **
Always	8.7%			
Most of the time	32.5%			
Sometimes	45.2%			
Rarely	12.1%			
Never	1.6%			
Opportunities to make positive impact on community/society		**-0.231*** **	**-0.113** **	**-0.120*** **
Always	3.7%			
Most of the time	16.4%			
Sometimes	31.9%			
Rarely	35.6%			
Never	12.5%			
Satisfaction of work well done		**-0.364*** **	**-0.325*** **	**-0.128*** **
Always	7.5%			
Most of the time	26.5%			
Sometimes	43.2%			
Rarely	19.8%			
Never	2.9%			
Feeling of doing useful work		**-0.313*** **	**-0.226*** **	**-0.137*** **
Always	6.1%			
Most of the time	20.3%			
Sometimes	45.9%			
Rarely	22.2%			
Never	5.5%			

Perceptions of Faculty Care

Question and Answer	Percent	PHQ-9 ρ	GAD-7 ρ	PHQ-9 Item 9 ρ
How much do advisers care about the success of your research project(s)?		**-0.184*** **	**-0.164*** **	**-0.161*** **
Do not care at all	2.3%			
Care somewhat	16.6%			
Care moderately	34.3%			
Care very much	46.9%			
How much do advisers care about you as a person?		**-0.236*** **	**-0.245*** **	**-0.160*** **
Do not care at all	7.8%			
Care somewhat	28.0%			
Care moderately	38.6%			
Care very much	25.6%			

Discussing Difficulties with Advisers Faculty

Question and Answer	Percent	PHQ-9 ρ	GAD-7 ρ	PHQ-9 Item 9 ρ
How easy is it for you to talk to advisers about non-academic career options?		**-0.193*** **	**-0.272*** **	**-0.184*** **
Not easy at all	49.7%			
Somewhat easy	22.6%			
Moderately easy	17.1%			
Very easy	10.6%			
How honest can you be with advisers about difficulties with research progress?		**-0.261*** **	**-0.313*** **	**-0.198*** **
Not honest at all	38.7%			
Somewhat honest	32.7%			
Moderately honest	19.8%			
Very honest	8.9%			
Teaching		**-0.215*** **	**-0.326*** **	**-0.183*** **
Not honest at all	4.0%			
Somewhat honest	15.9%			
Moderately honest	31.8%			
Very honest	48.4%			
Your mental health		**-0.284*** **	**-0.308*** **	**-0.296*** **
Not honest at all	41.5%			
Somewhat honest	32.7%			
Moderately honest	14.6%			
Very honest	11.1%			
Preparing for the job market		**-0.340*** **	**-0.312*** **	**-0.244*** **
Not honest at all	4.1%			
Somewhat honest	20.1%			
Moderately honest	30.1%			
Very honest	45.7%			

Number of advising meetings

Question and Answer	Percent	PHQ-9 ρ	GAD-7 ρ	PHQ-9 Item 9 ρ
In the last 2 months, # of times met with main adviser		**-0.005**	**0.077**	**0.002**
0	4.4%			
1	12.6%			
2	19.8%			
3	16.2%			
4	15.9%			
5	8.2%			
6-10	19.0%			
11-15	1.8%			
15+	2.1%			
In the last 2 months, total # of times met with one of three advisers		**-0.074**	**0.079**	**-0.035**
0	0.0%			
1	0.0%			
2	0.0%			
3	3.6%			
4	3.6%			
5	7.6%			
6-10	46.7%			
11-15	28.3%			
15+	10.1%			

How important are these to your sense of success in life?

Question and Answer	Percent	PHQ-9 ρ	GAD-7 ρ	PHQ-9 Item 9 ρ
Tenure at an academic institution		**-0.094****	**-0.064**	**-0.005**
Not important at all	14.1%			
Somewhat important	28.0%			
Moderately important	32.9%			
Very important	25.0%			
Tenure at a top-ranked academic institution		**-0.046**	**-0.098****	**0.009**
Not important at all	25.3%			
Somewhat important	36.8%			
Moderately important	25.3%			
Very important	12.5%			
High income		**0.069**	**0.012**	**0.048**
Not important at all	9.6%			
Somewhat important	37.3%			
Moderately important	37.9%			
Very important	15.2%			
Having your own family		**-0.084***	**0.001**	**-0.047**
Not important at all	5.9%			
Somewhat important	13.1%			
Moderately important	21.7%			
Very important	59.3%			

Seminar Environment

Question and Answer	Percent	PHQ-9 ρ	GAD-7 ρ	PHQ-9 Item 9 ρ
Comfortable voicing a thought in a seminar setting?		**-0.162*** **	**-0.115*** **	**-0.057**
Not comfortable at all	35.5%			
Somewhat comfortable	35.2%			
Moderately comfortable	19.3%			
Very comfortable	10.0%			

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

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

Sexual Harassment

Table: Have you experienced sexual harassment in your department?

	All	Male	Female	U.S. Undergrad	Non-U.S. Undergrad
Yes	16.2%	13.0%	21.5%	22.2%	8.9%

- 62.5% of the instances of harassment came from fellow grad student, 19% from a professor
- For comparison, 44% of women and 30% of men in grad and professional programs across U.S. report experiencing sexual harassment (2015 AAU Climate Survey)

Summary: Work Experiences & Mental Health

- Echoing previous literature: strong social support, meaning & purpose in work are all negatively correlated with mental illness
- Quality of advising relationships is more important than frequency of meetings
- It's just as hard for students to talk about mental health with advisers as it is for them to talk about research and non-academic jobs
- Only 20% of women feel comfortable speaking in seminars and more than 20% of women have experienced sexual harassment in the department

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Where Do We Go From Here?

Things to work on:

- Raise awareness of mental illness prevalence and characteristics
- Decrease stigma of treatment (point to other grad students!), improve access
- Increase collaboration & sources of **quality** social connections
- Improve advising relationships so that they are honest and supportive, in addition to evaluative
- Help students find meaning and purpose in their projects
- Improve seminar and departmental culture

Concrete Suggestions

- Departmental leadership & senior faculty talk early, openly, and seriously with students about the importance of mental health care
- Faculty stress the value of collaborating with other students, across years in the program, and building friendships
- Support student initiatives to build a happier, friendlier work environment (apply design thinking)
- Connect each student with a faculty volunteer early in the program whose job is purely to advise and support
- Steer students towards researching questions that they care about
- Partner with campus mental health services for interventions (e.g., Cognitive Behavioral Therapy, building a growth mindset, etc.)

What Do We Mean By Mental Health Disorder?

- Mental Health Disorder $\neq$ Stress
  - Clinical Depression $\neq$ "This is depressing"
- Known Psychological States
  - A state (e.g. depression) affects several elements of mental processing in a characteristic manner
    - ★ Ex: Depression: mood, memory, beliefs about self, sleep, appetite, psychomotor functioning, and scores of known others
    - ★ 1.65% productivity loss per 1 point increase in PHQ-9 (Beck 2011)
  - States are real
    - ★ Evidence from neuropathology, neuroimaging, genetics, endocrinology
  - For many: Cycle in and out. Often treatable.
- States are Socially Endogenous
  - Gene-environment interactions. Known environmental contributors
- Choice? Analogy: fight or flight vs. normal
  - Fight or flight often not a choice
  - Probably unwise to blame someone for their condition

Alternative Estimates ←

	Total	Gender Wgt	Country Wgt	Lower Est	Upper Est
Depression	17.7%	16.9%	17.4%	8.0%	62.9%
Anxiety	17.6%	16.8%	17.4%	8.0%	62.9%
Depression or Anxiety	24.8%	24.0%	24.7%	11.2%	66.1%
Suicidality 2-weeks	11.3%	11.2%	11.2%	5.1%	60.0%

Faculty Meaningfulness of Work ←

Question and Answer	Percent
Opportunities to fully use your talents	
Always	28.8%
Most of the time	57.1%
Sometimes	13.6%
Rarely	0.5%
Never	0.0%
Opportunities to make positive impact on community/society	
Always	17.8%
Most of the time	40.5%
Sometimes	35.1%
Rarely	5.9%
Never	0.5%
Satisfaction of work well done	
Always	24.2%
Most of the time	52.7%
Sometimes	19.9%
Rarely	3.2%
Never	0.0%
Feeling of doing useful work	
Always	19.5%
Most of the time	51.4%
Sometimes	24.9%
Rarely	3.8%
Never	0.5%

Faculty Perceptions of Relationships with Students

Question and Answer	Percent
How easy do you think it would be for them to talk to you about non-academic career options?	
Not easy at all	8.2%
Somewhat easy	23.5%
Moderately easy	41.5%
Very easy	26.8%
How honest do you think they would be with you if they faced difficulties with research progress?	
Not honest at all	0.5%
Somewhat honest	13.2%
Moderately honest	48.4%
Very honest	37.9%
Teaching	
Not honest at all	2.4%
Somewhat honest	20.0%
Moderately honest	44.7%
Very honest	32.9%
Their mental health	
Not honest at all	19.4%
Somewhat honest	53.5%
Moderately honest	22.4%
Very honest	4.7%
Preparing for the job market	
Not honest at all	0.0%
Somewhat honest	14.6%
Moderately honest	40.4%
Very honest	44.9%