Diversity in Elite Economics Departments in the United States

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Introduction

According to the New Dictionary of Cultural Literacy, *affirmative action* is described as policies with intention to increase the percentage of women and minorities in "jobs and educational institutions historically dominated by white men", and states that critics "dismiss it as 'reverse discrimination' that denies "opportunities for qualified whites and men" (E. D. Hirsch, J. F. Kett, & J. S. Trefil, 2002). Although, qualification standards do not seem to be the sole contributing factor of the cultivation of gender gaps and lack of minority representation that prompted the demand for affirmative action. Attention is being drawn to the lack of diversity in higher education. It can be observed at a variety of levels from students and faculty, department, department size, field of study, and the rank of the institution.

Previous research suggests that elite Economics departments are lacking the most demographic diversity. Bayer and Rouse (2016) state that "underrepresentation within the field of Economics is present at the undergraduate level and continues into the ranks of the academy." This research will explore the relationship between diversity, or gender and visible minority status, and the ranking of the top 100 economics departments in the United States. Factors that contribute to the underrepresentation of women and minorities of economic professors will also be investigated.

Background

It is not uncommon to see that women and minorities continue to be underrepresented in jobs and educational institutions across America. In academia, lack of diversity of faculty and students can be observed within individual departments and the university as a whole. Bayer and Wilcox (2017) note that "less than one-third of economics graduates in 2015 were women or a

historically underrepresented racial or ethnic groups in the U.S."

Previous research suggests the number of economic graduates has had an effect on the pipeline to faculty in the same field. Dynan and Rouse (1997) point out that "an undergraduate degree in economics is not necessarily a prerequisite to a Ph.D. in the field or in becoming a professor". However, it is fair to assume that economic graduate students could be expected to have studied economics ant the undergraduate level (Dynan and Rouse, 1997). Therefore, students that study economics as their undergraduate degree would be expected to make up the majority of the pool of candidates that continue to graduate school, then on to be tenured in Economics departments. This goes for ethic statuses as well. The U.S. Department of Education describes the "disparities in the percentage of faculty of color versus white are similar to disparities among post-secondary students" (2016). "Female and underrepresented minority undergraduates collectively major in economics at 0.36 the rate that white, non-Hispanic male students do" (Bayer & Wilcox, 2017). If the number of women and minorities have low representation as undergraduates, we can expect to observe just as low representation continuing up ladder of education in economics.

In a recent New York Times article, Terry Hartle, the Senior Vice President at the American Council of Education that represents more than 1,700 colleges and universities, explains how minorities, such as Blacks and Hispanics, that even with affirmative action have not gained ground at the "highly selective institutions", and that they are "more underrepresented at the nation's top colleges and universities than they were thirty-five years ago" (Ashkenas, Park, & Pearce, 2017). In 2006, out of "106 Ph.D. granting departments ranked by the National Research Council" there were only a total of forty-four black economists, where only "six of the forty-four were at Howard," a historically black university (Bayer & Rouse, 2016). It is apparent that ap-

plying affirmative action is not necessarily the key to reducing these discrepancies of diversity, especially at higher ranked schools.

Other researchers identify factors that explain the lack of diversity in economic professors are emerging from undergraduate student's initial decision to major in field (Dyan & Rouse, 1997). Majors like engineering, computer science, interior design, and nursing have strong reputations for gender bias. Males tend to dominate fields that demand skills in science, technology, engineering, and math (STEM), while women tend to prefer to study and work in fields that help society (U.S Department of Education, n.d.). Stereotypes and sexual norms portray women as caretakers. Therefore, when women try to participate in these male-dominated fields, they run the risk of being be seen as intellectually inferior or masculine. Likewise, when men pursue female-dominated fields, they can be viewed as "gay" or "feminine". These types of assumptions are "discouraging and harmful to the academic and professional development of all genders" not just women, and can effect prejudices among racial groups as well (Wu, 2017)

However, Amanda Bayer, Swarthmore College Economics professor, in an interview with the American Economics Association said that "forty-five percent of math majors at the undergraduate level are women". She describes Economics as an "outlier" because "women are major[ing] in math at a higher rate than they are economics" (Fleisher & Schoder, 2017). When ask if she had experienced any gender bias in here career, she responded that she was not aware of her gender, nor was it her identity until she was around other economists. Therefore, she claims that the high demand for mathematics is not a primary factor deferring women away (Fleisher & Schoder, 2017).

Previous research explain how these stereotypes have an "implicit bias effect on the aca-

demic pipeline" in terms of what classes professors are suggesting students to take, as well as the classroom environment early on (Carrell, Page, & West, 2010; Bayer & Rouse, 2016). Classrooms can "systematically disadvantage students who are members of traditionally unrepresented groups" to where the environment created by faculty choices can effect if women or minorities feel like economics is a field that they can be successful in (Bayer & Rouse, 2016). If students of these underrepresented groups see a professor of their same underrepresented background, they will feel more encouraged and that they have a better chance to succeed. A study found that female students performed better in math and science courses and were more likely to pursue related majors when these courses where taught by a female (Carrell, Page, & West, 2010). In addition, Owen (2010) found that a quality grade in their beginning economics courses has an "encouragement effect on their decision to study economics further" for female students, and did not find a similar effect to hold true for males.

The gender differences that we observe today are also said to be a result of the environment associated with economics in the classroom, office, and online. Previous research by Alice Wu followed a forum for economic faulty members, graduate students, and others to post and discuss their opinions on topics in the profession. She documented that discussions of women were "much more likely to involve topics related to personal information, physical attributes, or gender related terms". While discussions about men were more likely to stick to topics on economics and professional advice (Wolfers, 2017; Wu, 2017).

In the office environment, Okpara, Squillace, and Erondu (2005) found that job satisfaction and motivation plays a key role in women moving up the ladder in education, and that "ranks were significant in gender differences and job satisfaction". They found that female facul-

ty were more satisfied with their "work and their coworkers", while men were more satisfied and

motived by promotions and their pay. Therefore, gender discrepancies in tenured or tenured-track

faculty could also be explained by how men and women are motivated by different factors and

overall goals.

The purpose of this research is to analyze the relationship between the rank of Economic

departments in the United States and the diversity of the department. This study will also discuss

factors that contribute to the prevalent racial and gender gaps in students and department faculty

that are observed today.

Methodology

This relationship explores the relationship between how size and rank of an economics

department impacts diversity, and the proportion of females and minorities at the top 100 Eco-

nomics Departments in the United States. Rankings of the top twenty-five percent of Economic

departments as of June 2018 were retrieved from Research Papers in Economics (RePEc) biblio-

graphic database (RePEc.org, 2018). For each department, the number of tenured or tenured-

track professors were counted as well as the the percent of professors who are visibly female and

the percent who are one of five visible statuses — *White*, *Black*, *Asian*, *Indian*, or *Other*. For this

research, the ethnicity or visible minority status of a faulty member was determined only by

physical appearance from department website photograph. Visible minority status includes all

categories with the exception of *White*. This information was then used to calculate the percent

of females, the percent of each unique ethnicity, the percent of total visible minorities, and the

diversity index of each individual department. Simpson's Diversity Index is an index "used to

summarize the diversity of a population in which each member belongs to a unique

group" (NIST, 2016) Maximum diversity is indicated by a diversity index of 1. Minimum diversity is indicated by a diversity index of 0. The closer the diversity index is the 1, the more diversity there is. This index was used to formulate the diversity within departments and is specified as

$$D = \frac{N(N-1)}{\sum n(n-1)}$$

where the variable D represents the diversity measurement, n represents the number of professors of each ethnicity, or group, in one department, and N represents the total number of professors across all departments. Summary statistics for diversity and visible minority status can be found in *Table 1*. Each dependent variable is modeled as a function of either rank of the department or rank and size of the department where dependent variables are % *Female* represented as *F*, % *Minority* represented as *M*, and *Diversity Index* represented as *DI*. Models that are used to describe percent female of a department by rank while controlling for the size of the department are specified as

$$\% \text{ Female: } F = \beta_0 + \beta_1 Rank$$

$$\% \text{ Female: } F = \beta_0 + \beta_1 Rank + \beta_2 Total$$

β_0 is the intercept parameter estimate, and β_1 identifies the marginal effect the rank of the institution has on the proportion of females (F). β_2 identifies the marginal effect the total number of professors, or size of department has on the proportion of females (F). Models used to describe the relationship between percent minority and rank while controlling for the size of the department are specified as

$$\% \text{ Minority: } M = \beta_0 + \beta_1 Rank$$

$$\% \text{ Minority: } M = \beta_0 + \beta_1 Rank + \beta_2 Total$$

where β_0 is as described previously, and β_1 identifies the marginal effect the rank of the institu-

tion has on the percent minority (M). In addition, β_2 identifies the marginal effect the total num-

ber of professors, or size of department has on the percent minority. Models used to describe the

relationship of diversity and rank while controlling for the size of the department are specified as

$$\text{Diversity: } DI = \beta_0 + \beta_1 Rank$$

$$\text{Diversity: } DI = \beta_0 + \beta_1 Rank + \beta_2 Total$$

β_0 as described previously, and β_1 identifies the marginal effect the rank of the institution has on

the overall diversity (D). β_2 identifies the marginal effect the total number of professors, or size

of department has on overall diversity as well (D). Estimation results are presented in table 2.

For all models, β_1 and β_2 are both parameters to be estimated. Estimation results are presented in

table 2.

Results

Table 1 contains the summary statistics for the data collected on each group on the top

ranked economics departments. All attributes had a minimum of zero except for white men who

had a minimum of 44.44% white. On average, black professors were represented the least at

1.6%. The maximum percent female of all the departments was 92.86%, while the average per-

cent female was 26.59%. The maximum percent minority of all the departments was 55.56%,

while the average percent minority was 21.97%. The average diversity index measured at 0.36.

Model 1 for percent female is illustrated in *Figure 1* and depicts the relationship between

rank of the department and percent of faculty that is visibly female. A positive statistically sig-

nificant correlation was found between the two in that one percent of females increases as the

rank increases at a rate of 0.002. (See *Table 1*). This model suggests prestigious institutions have less percent of females compared to other economics faculty. Model 2 for percent female is illustrated in *Figure 1* and depicts the relationship between rank of the department and percent of female faculty while controlling for the size of the department. The marginal effect of rank increases to 0.037, while the marginal impact of the total amount of faculty on percent of female faculty is 0.21. Model 2 supports the findings of Model 1 in terms of rank having a positive effect on the percent female yet not being statistically significant. These results suggest that less prestigious institutions have a larger proportion of female faculty member.

Model 3 for percent minority is illustrated in *Figure 1* and depicts the relationship between rank and percent of minorities per department and shows a slight positive correlation with a parameter estimate of 0.0006. However, this was not found statistically significant (See *Table 2*). Model 4 for percent minority is illustrated in *Figure 2* and shows the relationship between rank and percent minority. The parameter estimated for rank was 0.0001, but again, was not significant. The parameter estimate for size was -0.002 (See *Table 2*). The marginal impact of rank on percent minority decreased from Model 3 to Model 4 suggesting that the level of diversity is driven more by the size of the department rather than its rank.

Model 5 in *Figure 3* explores the relationship between diversity and rank in economic departments. There is a slight correlation between these two variables; institutions become more diverse the lower they are ranked at a statistically significant rate of 0.0006 (See *Table 2*). Model 6 illustrates the relationship between the diversity index and the rank and size of the department in *Figure 3*. The parameter estimate for rank in this model was 5.56^{-05}, and the parameter estimate for size was -0.002 (See *Table 2*). Both coefficients are not statistically significant. From

Model 5 to Model 6, the marginal impact of rank decreases after the size of the department was considered suggesting that smaller lower ranked departments show more favor towards diversity yet the smaller size of the department negatively effects potential for diversity.

Discussion

Results from this research support the hypothesis that more prestigious economics departments in the United States are somewhat less diverse than less prestigious counterparts. However, the observed relative lack of diversity was limited to female representation.

I also find that it is important to control for the size of the department . This is because there are two different competing effects occurring that made it important to control for size of the departments. For example, if fifteen percent of economics graduates are women, eighty-five percent of graduates are men. If the size of the department only consists of two professors, the probability having two male professors is as follows: $0.85 * 0.85 = 0.723$. There is over a 70% chance both faculty members will be male versus the 2.25% chance both faculty will be female. As the size of the department increases, so will the probability of a greater number of females and a less likely chance that departments will have zero women.

Therefore, one effect is that smaller and lower ranked departments are more likely to hire women, yet the departments may be less likely to actually have women as part of the staff because of the total number of faculty is low. It may not be the case of sexism, but rather the limited number of qualified individuals in economics or aspiring to tenured-track professors would fall back on these groups' self-selection into the field of economics. Yet, given that less prestigious departments have fewer faculty members, the fact there is still an inverse relationship between the prestigiousness of the department and percentage of faculty who are visibly female,

even before controlling for the size of the department, is somewhat surprising and suggestive of sexism. Wu (2017) found evidence of sexism in a study that followed a forum set up for economic faculty members and graduate students to post and discuss their opinions on topics in the profession. She found that "discussions of women are much more likely to involve topics related to personal information, physical attributes, or gender related terms", while discussions about men were more likely to stick to "topics like economics itself" and professional and career advice.

There are two different competing effects occurring that made it important to control for size of the departments. One effect is that smaller and lower ranked departments are more likely to hire women, yet the departments may be less likely to actually have women as part of the staff them because of the initial total number of faculty is low. This can be used to explain the professors who are viewed as a minority as well. It may not be the case of sexism, racism, or both crowding economics departments, but the limited number of qualified individuals in economics or aspiring to tenured-track professors would fall back on these groups' self-selection into the field of economics.

A factor that could explain the gender differences in tenured or tenure-track faculty in economics is the time in which professors have to publish research. Professors are expected to publish research in order to move up in academia. Men tend to focus more or their promotion, status, or ranks, and these ranks are significant in explaining gender differences (Okpara, et., 2005). Life decisions could play a role in the time professors have to publish research and progress in ranks in academia. Women are more likely than men to have to make decisions that may take away their ability to publish for reasons such as fertility and taking time off take care of a child. Where a woman is expected to stay home and raise her family, men would not have this

type of interruption, could publish more frequently, and reach tenured sooner.

A study by Babcock, Recalde, & Vesterlund (2017) contends the idea that professors that are more involved in their department and field by such serving on committees, would be important to the ability to be promoted, which can be supported by findings in this research. A suggestion would be to encourage women to do fewer "non-tenurable" work related tasks (e.g., serve on pointless committees). At lower ranked schools, serving on a committee is extremely important and valuable, while at higher ranked schools, it is not important. Therefore if a woman at a higher ranked school more often volunteers to serve on a needless committee, she has less time to research and would lead to less publishing. Furthermore, women are more likely to volunteer for these "non-tenurable" tasks than men leaving men with more time to research.

An additional suggestions to limit discrepancies in gender and diversity would be to increase awareness and support for underrepresented groups in the field of economics. For example, the Department of Electrical Engineering and Computer Science encourages young women to pursue STEM topics though their Women's Technology Program (O'Leary 2017). Data for this research was limited to only one hundred economics departments in the United States. According to RePEc (2018), there are 14,137 economic institutions in 232 countries. Selecting a larger sample size of departments could provide more insight to factors that cause discrepancies in diversity for future research.

Table 2

	% Female		% Minority		Diversity Index	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
RANK	0.002	0.037	0.001	0.0002	0.001	0.000
	(0.001)	(0.011)	(0.0004)	(0.001)	(0.001)	(0.001)

TOTAL	0.210		-0.002		-0.002
	(0.027)		(0.001)		(0.002)
Constant	0.184	-2.367	0.189	0.265	0.331	0.429
	(0.032)	(1.25)	(0.023)	(0.059)	(0.031)	(0.078)
OBS	100	100	100	100	100	100
R Square	0.0828	0.3968	0.0228	0.0422	0.0132	0.0316

Table 1

	Mean	Std	Min	Max
% Female	26.59	16.36	0	92.86
% Minority	21.97	11.66	0	55.56
Diversity Index	0.36	0.15	0	0.68
% White	78.03	11.66	44.44	100
% Asian	10.95	8.74	0	38.89
% Indian	6.54	4.69	0	19.05
% Black	1.6	2.88	0	15.38
%Other	2.89	3.79	0	17.65

Figure 1:

% Female vs. Rank

Figure 2:

% Minority vs. Rank

Figure 3:

Diversity Index vs. Rank
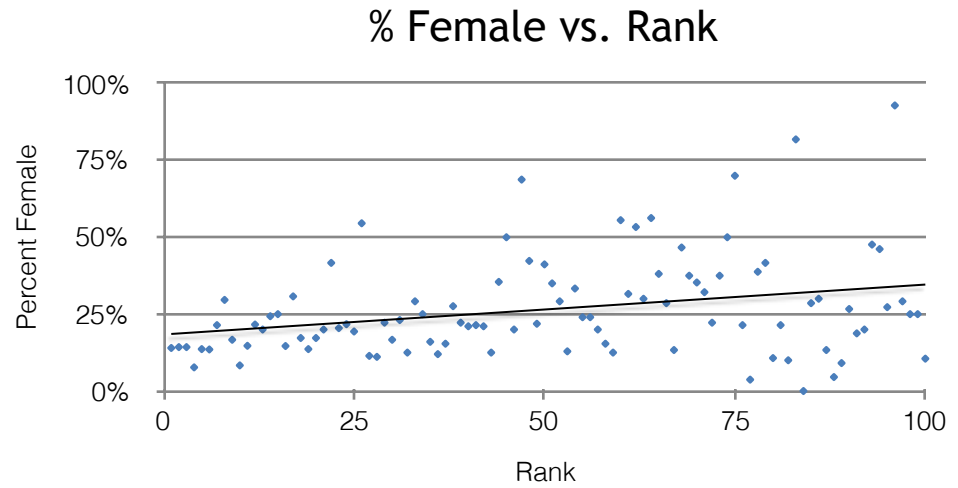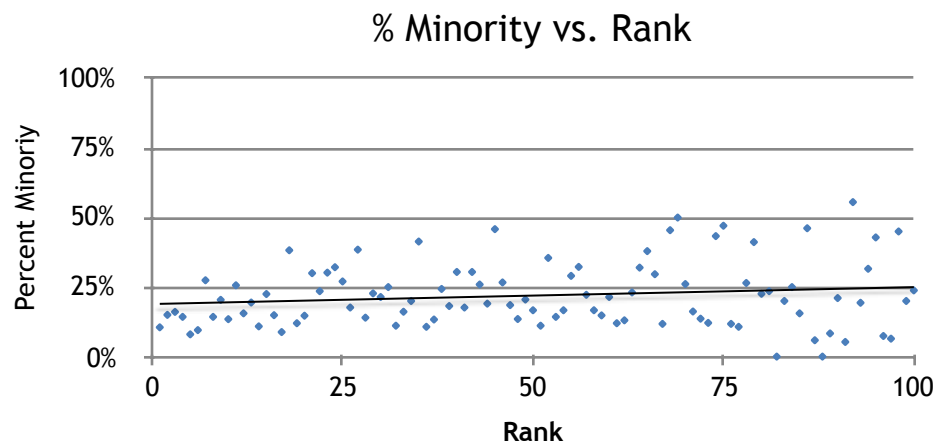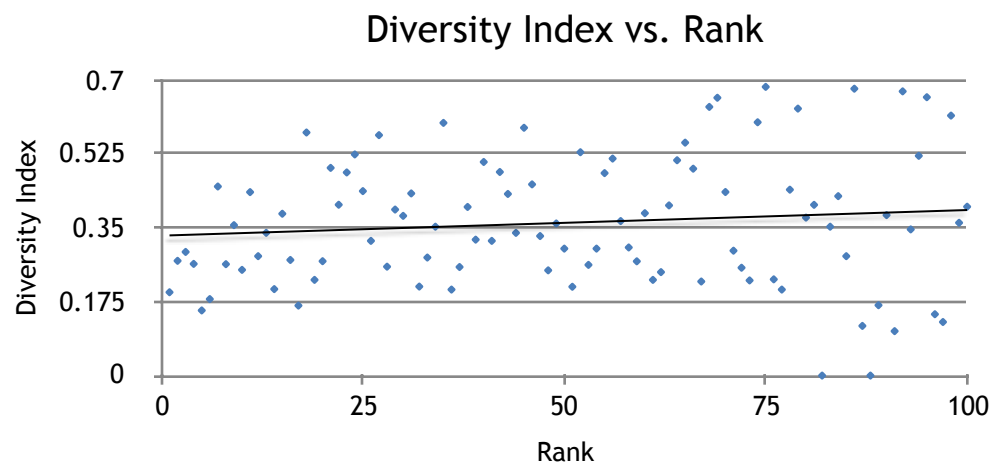
References

Ashkenas, J., Park, H., & Pearce, A. (2017). Even with affirmative action, blacks and hispanics are more underrepresented at top colleges than 35 years ago. The New York Times.

Babcock, L., Recalde, M.P., Vesterlund, L. (2017). Gender differences in the allocation of low-promotability tasks: The role of backlash, *American Economic Review,* 107(5): 131–135, https://doi.org/10.1257/aer.p2017101

Bardaro, K. (2018). 10 college majors with the biggest gender gap. Retrieved July 29, 2018, from https://www.bachelorsdegreeonline.com/blog/2012/10-college-majors-with-the-biggest-gender-gap/

Bayer, A., & Rouse, C.E. (2016). Diversity in the economics profession: A new attack on an old problem. *Journal of Economic Perspectives*, *30* (4): 221-42.

Bayer, A., & Wilcox, D.(2017). The unequal distribution of economic education: A report on the race, ethnicity, and gender of economics majors at U.S. colleges and universities, Finance and Economics Discussion Series 2017-105. Washington: Board of Governors of the Federal Reserve System, https://doi.org/10.17016/FEDS.2017.105.

Carrell, S. E., Page, M. E., & West, J. E. (2010). Sex and science: How professor gender perpetuates the gender gap. *The Quarterly Journal of Economics*, *125*(3), 1101-1144.

Fleisher, C., & Schoder, D. (2017). The gender gap in economics. The american economics association. Retrieved July 29, 2018, from https://www.aeaweb.org/research/gender-gap-economics-profession-interview-with-amanda-bayer

Hirsch, E., Kett, F.K., & Trefil, J. S. (2002). Affirmative action. In, *The New Dictionary of Cultural Literacy,* Houghton Mifflin (3rd ed.). Boston, MA: Houghton Mifflin. Retrieved from https://login.cyrano.ucmo.edu:2048/login?url=https://search.credoreference.com/content/entry/hmndcl/affirmative_action/0?institutionId=1035

Karen E. Dynan & Cecilia Elena Rouse (1997) The underrepresentation of women in economics: A study of undergraduate economics students, *The Journal of Economic Education*, *28*(4), 350-368, DOI: 10.1080/00220489709597939

National Institute of Standards and Technology. (2016). Simpson diversity index. Retrieved July 30, 2018, from https://www.itl.nist.gov/div898/software/dataplot/refman2/auxillar/simpson.htm

Okpara, J., Squillace, M., & Erondu, E.A. (2005). Gender differences and job satisfaction: a study of university teachers in the United States. *Women in Management Review, 20*(3), 177-190, https://doi.org/10.1108/09649420510591852

O'Leary, M. B. (2017). Closing the gender gap in mechanical engineering. *Massachusetts Institute of Technology,* Retrieved July 29, 2018, from http://news.mit.edu/2017/closing-the-gender-gap-in-mit-mechanical-engineering-0731

Owen, A.L., (2010) Grades, gender, and encouragement: A regression discontinuity analysis, *The Journal of Economic Education*, (41)3, 217-234, DOI: 10.1080/00220485.2010.486718

Owens, C. T. (2004). Affirmative action. In J. G. Geer (Ed.), *Public opinion and polling around t he world: a historical encyclopedia*. Santa Barbara, CA: ABC-CLIO. Retrieved from h ttps://login.cyrano.ucmo.edu:2048/login?url=https://search.credoreference.com/content/ entry/abcopinion/affirmative_action/0?institutionId=1035

RePEc.org. (2018). Top 25% US Economics Departments, as of June 2018. *Research Papers in Economics*, Retrieved July 30, 2018, from https://ideas.repec.org/top/ top.usecondept.html.

U.S. Department of Education. (n.d.). Science, technology, engineering and math: Education for global leadership. *United States Department of Education.* Retrieved July 29, 2018, from https://www.ed.gov/stem

U.S Department of Education, Planning, Evaluation and Policy Development. (2016) *Advancing diversity and inclusion in higher education: Key data highlights focusing in race and ethnicity and promising practices.* Retrieved July 21, 2018, from https://www2.ed.gov/ rschstat/research/pubs/advancing-diversity-inclusion.pdf

Wu, A. H. (2017). *Gender stereotyping in academia: Evidence from economics job market rumors forum*. University of California-Berkeley. 26