



Gender disparities in colloquium speakers at top universities

Christine L. Nittrouer^{a,1}, Michelle R. Hebl^a, Leslie Ashburn-Nardo^b, Rachel C. E. Trump-Steele^a, David M. Lane^{a,c}, and Virginia Valian^d

^aDepartment of Psychology, Rice University, Houston, TX 77251; ^bDepartment of Psychology, Indiana University–Purdue University Indianapolis, Indianapolis, IN 46202; ^cDepartment of Statistics, Rice University, Houston, TX 77251; and ^dDepartment of Psychology, Hunter College, New York, NY 10065

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Colloquium talks at prestigious universities both create and reflect academic researchers' reputations. Gender disparities in colloquium talks can arise through a variety of mechanisms. The current study examines gender differences in colloquium speakers at 50 prestigious US colleges and universities in 2013–2014. Using archival data, we analyzed 3,652 talks in six academic disciplines. Men were more likely than women to be colloquium speakers even after controlling for the gender and rank of the available speakers. Eliminating alternative explanations (e.g., women declining invitations more often than men), our follow-up data revealed that female and male faculty at top universities reported no differences in the extent to which they (i) valued and (ii) turned down speaking engagements. Additional data revealed that the presence of women as colloquium chairs (and potentially on colloquium committees) increased the likelihood of women appearing as colloquium speakers. Our data suggest that those who invite and schedule speakers serve as gender gatekeepers with the power to create or reduce gender differences in academic reputations.

academia | gender bias | gatekeepers | colloquia | professional recognition

It is not a new notion that female faculty face disadvantages relative to their male colleagues. Past documented disadvantages for female (relative to male) faculty at Massachusetts Institute of Technology include less laboratory space, less optimal office space, decreased equipment funding, lower amounts of research support and funding, inequitable service burdens, and decreased salary (1). In efforts to eliminate institutional discrimination, many colleges and universities now maintain task forces to ensure that equity exists between male and female professors (2). Such task forces have been effective at reducing many of the overt, formal types of discrimination against women, further bolstering the Civil Rights Act of 1991, which already protected female academicians against gender disparities (3).

Almost 20 years ago, Valian published *Why So Slow?*, a book addressing the fact that, despite the passage of Title VII and more equitable proportions of women and men entering professional fields, women continued to lag behind men in earnings, promotions, and positions at the top in virtually all professional disciplines (4). Recent data confirm that progress has been slow over the last 20 years in terms of the representation and salaries of men and women in many occupational domains (5–8). Some have argued that such disparities arise from the different choices that men and women make, such as women opting out of tenure-track positions, or spending more time with their families, thus stalling their progress midcareer, or engaging in aspects of work (e.g., teaching, service) that are less highly rewarded, or possibly fearing or avoiding success (5–8).

A different explanation is that seemingly innocuous schemas or stereotypes that people hold about men and women give rise to substantially different expectations, behavioral confirmations, and workplace trajectories for the genders, which, in turn, produce lingering disparities (9). The biases may not be conscious, in that individuals may be unaware of their schemas and stereotypes. However, these same individuals often serve as gatekeepers, or

individuals who make decisions about who will enter and advance in the workplace. Gatekeepers may inadvertently restrict women from fulfilling their workplace potential. Three very recent sets of studies confirm the presence of subtle forms of disparate treatment of female (versus male) academicians and reveal the implications of schemas and stereotypes. First, recent research has shown gender differences in the letters of recommendation written for job applicants who are on the academic job market. In particular, both male and female letter writers tend to use more caring words and fewer agentic words to describe female compared with male PhD candidates; further, the more caring words in letters, the more negatively the candidates were perceived (10). Letter writers (both male and female) also wrote longer letters on average for men than women, and they used more hedging and doubt-raisers (“she ‘has the potential to be’ good” versus “he ‘is’ good”; she “appears to be a highly motivated colleague” versus he “is a motivated colleague”) in letters written for women than for men (11). Although such seemingly small differences in word choice may seem innocuous, the results tell another story. Letter writers serve as gatekeepers and are less positive about women than men, even when their achievements may be equivalent.

Second, work previously published in PNAS (12) found lower hiring and competence ratings, lesser willingness to mentor, and lower recommended starting salaries for a female (versus a male) laboratory manager, despite the fact that the applications (aside from the gendered name) were identical. Faculty need not overtly choose men over women; rather, their stereotypes result in their unintentionally valuing the male more than the female researcher.

Significance

Recently, research has focused on identifying gender gatekeepers—people or practices that may (unintentionally) engage in, create, or maintain gender disparities. In the current research, we examine gender differences in academic colloquium speakers. Colloquium talks lead to enhancement of a researcher's reputation, networks, research collaborations, and sometimes result in job offers. Results from our three studies indicate that women are underrepresented relative to men as colloquium speakers across six disciplines. To examine the role of self-selection, we find that women neither decline talk invitations at greater rates nor question the importance of talks more than men do. Finally, we show that the presence of women as colloquium chairs (and potentially committee members) increases the likelihood of having female colloquium speakers.

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¹To whom correspondence should be addressed. Email: cln4@rice.edu.

Third, teachers receive lower teaching evaluation ratings if their online students believe that they are women versus men (13). Student evaluations were systematically lower for women than men, so much that the authors concluded that teaching evaluations may be better instruments for reflecting bias than teaching quality. Additional studies similarly show that female (versus male) teachers are rated more negatively (14–17). For example, participants who read a lecture, which was posited as having been written and delivered by a male or female professor, rated the lecture by the male (versus the female) professor significantly more positively (18). Thus, gatekeepers affect the careers of men and women in academia at a range of levels. Gender gatekeeping results in slower advancement for women compared with men (4).

In the current research, we examine gatekeepers in an aspect of academia that has not yet been the focus of any known previous research attention. Specifically, we examine the proportion of male and female colloquium speakers who gave talks at top US institutions. Colloquium talks are an important part of academicians' careers, providing an opportunity to publicize one's research, begin and maintain synergistic and productive collaborations, and enhance one's national reputation; those results in turn typically lead to retention, promotion, or greater salary increases (19, 20). Individuals or committees responsible for choosing colloquium speakers, then, also serve as gender gatekeepers and may thereby reinforce the research and careers of the speakers they select. Colloquium talks also signal to audience members who is worthy of being invited.

Current Study

The present research is unique in addressing whether there are gender differences and disparities (relative to available pools) in colloquium speakers at the top 50 universities and whether that disparity remains even after controlling for obvious alternative explanations (e.g., higher rates of men than women in academia, different levels of interest in and ability to travel for the sake of giving colloquium talks). Additionally, it examines whether these differences are moderated by factors such as rank, program, gender of the colloquium committee chair, and gender composition of the colloquium committee.

We created a database from all of the speakers on the departmental websites of the top 50 universities in the country (21). We recorded the gender of every speaker in six disciplines (biology, bioengineering, political science, history, psychology, sociology), which range from 22 to 47% female. We chose these disciplines in an effort to represent the main colleges (e.g., social science, humanities, natural science, engineering) at the top schools. We excluded disciplines with either a very low or very high representation

of women. In examining the speakers giving talks at these schools, we found that many came from a wider swath than just the top 50 universities (e.g., University of Florida, The Ohio State University, University of Washington, University of Texas-Austin); thus, we counted the numbers of men and women in each department and each faculty rank at the top 100 universities to provide baselines against which to compare the numbers of male and female colloquium speakers. We also emailed a subset of faculty members—both those who had and those who had not given talks at any of the canvassed schools in 2013–2014—to determine whether giving colloquium talks was significantly more important to men than women, and whether men reported declining these talk invitations significantly less frequently than did women. Finally, we asked the administrators of all 300 of these programs (many programs had more than one administrator that we contacted) to tell us the gender of the colloquium chair or the gender composition of their colloquium committee.

Methods

Researchers obtained Rice Institutional Review Board (IRB) approval for each of the three sets of data collection that were conducted (IRB no. 709893-2). For the first dataset, we collected archival data from websites of the top 50 colleges and universities in the United States (as documented by *US News and World Report*, 2013–2014) to identify all 3,652 speakers who gave a talk in one of six disciplines (biology, bioengineering, history, psychology, sociology, and political science) (21). Each speaker was only included one time in our dataset to control for speakers who gave more than one talk. In Table 1, we present and compare the percentages of available female and male speakers (broken down by both discipline and rank) who actually gave talks. (The numerator is the number of female or male speakers and the denominator is the number of possible female or male speakers.)

For the second dataset, we collected responses from a subset of faculty members ($n = 186$; 15% response rate). We sampled faculty who did not give a colloquium talk at one of the top 50 colleges and universities but were in the same departments and universities as those who did. [In an earlier version of this manuscript, we reported the ratings of "importance of giving talks" and "talks declined" derived from a sample of the colloquium speakers ($n = 188$; 19% response rate)]. No significant gender differences emerged ($p > 0.4$) in this sample, either. However, those individuals clearly believed giving talks were important since they all gave talks; hence, we just include the numbers from those who did not give colloquium talks.) Of those who responded, 104 (56%) were male and 82 (44%) were female; 43 (23%) participants were from biology, 18 (10%) were from bioengineering, 15 (8%) were from history, 31 (17%) were from political science, 40 (22%) were from psychology, and 39 (21%) were from sociology; and 51 (27%) were assistant professors, 47 (25%) were associate professors, 82 (44%) were full professors, and 6 (4%) did not indicate their rank.

Contacted faculty who consented to participate indicated (i) the number of colloquium talks they declined at top 50 universities in the United States for the 2013–2014 academic year, and (ii) the extent to which they perceived

Table 1. Frequency and percentage of male and female faculty available vs. male and female faculty actually giving talks: Comparisons in six disciplines at three professorial ranks

	Biology		Bioengineering		Political science		Psychology		Sociology		History	
	M	F	M	F	M	F	M	F	M	F	M	F
Assistant professors												
Total no. in pool	664	470	472	191	382	293	330	350	205	262	318	308
Total no. of speakers	188	101	111	35	85	51	57	49	45	48	60	52
% giving talks	28	22	24	18	22	17	17	14	22	18	19	17
Associate professors												
Total no. in pool	843	428	508	162	501	305	386	388	221	268	708	606
Total no. of speakers	215	96	131	42	70	42	66	49	39	41	120	78
% giving talks	26	22	26	26	14	14	17	13	18	15	17	13
Full professors												
Total no. in pool	2,055	679	945	189	1,048	327	1,120	623	596	379	1,236	589
Total no. of speakers	428	115	248	42	196	63	142	66	114	67	204	96
% giving talks	21	17	26	22	19	19	13	11	19	18	17	16

that it was important to give colloquium talks. For the last measure, participants indicated their agreement with four 5-point Likert-type scale items, anchored by 1 = "Do not agree" and 5 = "Completely agree," that were then combined to create an Importance Composite. These items include the following: "I try to go to every place I'm invited to talk," "Going to places to give invited colloquium talks is important to me," "I avoid going to places to give invited colloquium talks because of family obligations" (reverse-coded), and "Going to places to give invited colloquium talks helps my career."

For the third dataset, we contacted 425 administrators (from each of the six disciplines at the top 50 colleges and universities) and explained the study and obtained their verbal consent to participate before we asked them our survey questions. The goal of studying the colloquium committees was to determine whether female membership was related to the number of female speakers. The sample was not large enough to examine potential moderators of the relation between faculty rank and discipline. Previous research has suggested that female chairs or a substantial proportion of female members results in more women receiving academic awards (22, 23). A total of 91 administrators from different programs (21% response rate) agreed to participate.

A set of power analyses calculated to detect moderate effect sizes revealed that our sample sizes exceeded the recommended participant numbers for all three sets of analyses ($n = 172, 148, \text{ and } 89$, respectively).

Results

There was a substantial difference in the number of colloquium talks given by men and women at the top 50 colleges and universities in the United States. Men gave over twice as many colloquia overall (69%, $n = 2,519$) as did women (31%, $n = 1,133$). Although full professors gave the most colloquium talks ($n = 1,781$), a large number of associate professors ($n = 989$) and assistant professors ($n = 882$) also gave talks. Our focus was on differences in the proportions of men and women giving talks, as shown in Fig. 1 and discussed below.

Table 1 shows the number of faculty members in the pool and the percentage giving talks as a function of program, rank, and gender. Rounded to the nearest whole number, the percentage of men giving talks was higher than the percentage of women giving talks in 15 of the 18 combinations of rank and program, and the percentage was the same in 3 of the 18 combinations. This difference is significant by a binomial significance test ($P < 0.001$). We conducted a logistic regression to predict whether a person would give a talk with the factorial combination of program, rank, and gender as predictor variables. The effect of gender was significant, $\chi^2(1) = 18.3, P < 0.0001$, and there was no evidence for gender by rank, gender by program, or gender by rank by program interactions with p values of 0.40, 0.81, and 0.91, respectively. Controlling for all other variables, the ratio of the odds of a male giving a talk to the odds of a female giving a talk was 1.2:1, with the 95% confidence interval on this odds ratio ranging from 1.11 to 1.32. The absence of interactions with gender means that there is no evidence of differences in the gender effects shown in Table 1 as a function of rank and program.

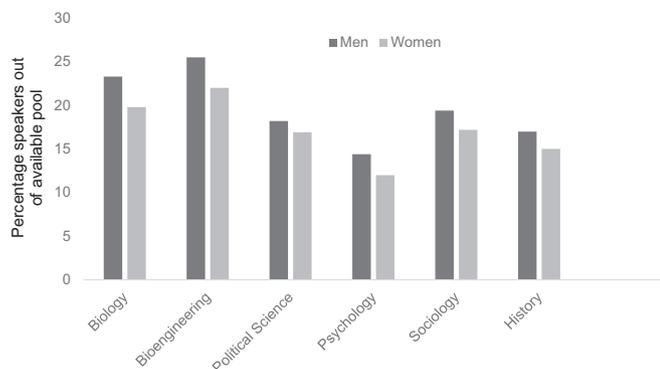


Fig. 1. Study 1: Percentage of male and female speakers out of the available pool by department giving colloquium talks.

In addition to the main effect of gender, there were also main effects for program, $\chi^2(5) = 114.9, P < 0.0001$ and rank, $\chi^2(2) = 6.4, P = 0.041$. Because the logistic regression also showed a significant program by rank interaction, $\chi^2(10) = 36.6, P < 0.0001$, we do not discuss the main effects. Table 1 shows the percentage of assistant, associate, and full professors giving talks as a function of program. As can be seen in Table 1, the interaction is complex. For example, in biology, assistant professors were more likely to give talks than were full professors, whereas the opposite is true for bioengineering. As another example, in political science an assistant professor was much more likely to give a talk than was an associate professor, but this difference was much smaller in psychology. Although we have no explanation for this interaction, it is unrelated to our primary concern, the effect of gender.

Faculty Subsample. There was no significant gender difference in the number of times participants declined invitations to give colloquium talks [$M_{\text{women}} = 0.53, SD_{\text{women}} = 1.2; M_{\text{men}} = 0.50, SD_{\text{men}} = 1.1; F(1, 176) = 0.06, P = 0.81$]. That is, women do not decline invited colloquium talks more than men. Additionally, we found no gender differences in ratings of the importance of giving colloquium talks [$M_{\text{women}} = 3.45$ on a scale from 1 to 5, $SD_{\text{women}} = 0.77; M_{\text{men}} = 3.28; SD_{\text{men}} = 0.80; F(1, 185) = 2.02, P = 0.16$]. If anything, women evaluated giving talks as higher in importance than did men, although the difference did not attain statistical significance. On the individual items comprising importance, no differences emerged on any item [item 1: "I try to go to every place I'm invited to talk," $M_{\text{women}} = 3.70, SD_{\text{women}} = 1.3, M_{\text{men}} = 3.46, SD_{\text{men}} = 1.34$; item 2: "Going to places to give invited colloquium talks is important to me," $M_{\text{women}} = 3.99, SD_{\text{women}} = 1.06, M_{\text{men}} = 3.70, SD_{\text{men}} = 1.11$; item 3 (reverse-coded): "I avoid going to places to give invited colloquium talks because of family obligations," $M_{\text{women}} = 3.99, SD_{\text{women}} = 1.16, M_{\text{men}} = 3.81, SD_{\text{men}} = 1.24$; item 4: "Going to places to give invited colloquium talks helps my career," $M_{\text{women}} = 4.10, SD_{\text{women}} = 1.13, M_{\text{men}} = 3.79, SD_{\text{men}} = 1.1$]. Thus, women neither decline invitations to give colloquium talks more than men do, nor do they place less importance on accepting and giving colloquium talks than men do. The observed gender differences in the numbers of talks given by men and women are not likely due to self-selection.

Colloquium Committee Composition. We created a composite variable called percentage female speakers, consisting of the number of women speaking in a departmental colloquium (taken from the archival data) divided by the total number of speakers. We used percentage female speakers as the outcome variable and tested potential characteristics that would predict a higher percentage of female speakers.

First, we examined whether a committee would make different decisions than a single person. Of the 91 administrators who responded to our survey, 34 indicated that the colloquium speaker selection process was handled by an individual (37%), and 57 indicated that this process was handled by a colloquium committee (63%). We regressed the individual/committee variable onto the percentage female speakers and found no significant difference, $t(97) = 1.09, P = 0.28$.

Second, we examined the 34 individuals (23 male; 11 female) who served as colloquium chairs to determine whether the gender of the chair significantly predicted the percentage female speakers. We found that committees with female chairs sponsored talks in which 49% of colloquium speakers were women, whereas those with male chairs sponsored talks in which 30% of colloquium speakers were women [$t(32) = 2.24, P = 0.03, d = 0.77$].

Third, we examined the 57 groups comprising colloquium committees, which consisted of 145 men and 140 women. For each committee, we determined the percentage of female speakers and

regressed this percentage on the proportion of women on the committee. There was a strong hint of an effect, but it did not reach conventional levels of significance [$t(55) = 1.93$, $\beta = 0.41$, $R^2 = 0.1$, $P = 0.059$]. That is, colloquium committees that had a greater representation of women on them were marginally more likely to have a higher percentage (41%) of female colloquium speakers.

Discussion

These results provide evidence that a man is more likely to give a colloquium talk at a top 50 college or university than is a woman. This effect was consistent across the three different ranks and six different departments, showing a strong generalization of the results. One might suppose that gender bias would occur most frequently in the senior ranks; however, no such effect was apparent in our data.

Given the data from our faculty subsample, it cannot be argued that the discrepancy between women and men in giving colloquium talks is due to women turning down talks more frequently than men do or women thinking that giving colloquium talks is less important than men think giving talks is. The inclusion of one gender over the other in positions of visibility (e.g., colloquium talks) may not, at first glance, seem to be that problematic. However, this action, compounded across talks, has the potential to have stark negative consequences for women: Success is the accumulation of small advantages (4). Consistent with social role theory (24, 25), if women are less visible, they may be perceived to have less success and may as a result get to practice their skills less frequently, both of which could harm women's careers. As status indicators, talks also signal to audiences who counts. The message to aspiring young female researchers who see many more male than female speakers can be discouraging.

Our administrator sample reveals a significantly positive relationship between the gender of the individuals making the decisions about whom to invite and the percentage of female speakers represented in each discipline. There is also a positive, albeit marginal, relationship between the percentage of women on the colloquium committees and the percentage of female speakers represented in each discipline. However, due to the sample size, we cannot examine any potential moderators of this relationship (e.g., faculty rank, discipline). The inclusion of women on selection committees leading to an enhanced selection of women is supported by other data in the field (26). However, other possibilities are also at play. For instance, consider the availability heuristic (22): Because female professors are so few, these women may be hyperaware of the other women in their fields. (We are grateful to one of our reviewers for suggesting the potential influence of the availability heuristic.) As such, female (versus male)

committee members may be more likely to include female speakers. Future research is needed to delineate the mechanism more clearly and also identify potential moderators.

This study provides empirical evidence of gender disparities in the representation of colloquium speakers at top tier research universities in the United States. Since the opportunity to present one's work is related to career advancement within academia (19, 20), a gender disparity in this opportunity may be costly for women. One limitation of our study was its focus on six disciplines; it is not clear if our results would generalize to other fields. However, our six fields spanned the natural and social sciences and included fields with different percentages of women. Further, although our study is high in external validity, it is difficult to say exactly which psychological mechanisms are driving our findings. Bias could be one contributor to the results, and it is consistent with the discrepancy that emerged between male and female faculty speakers in the colloquium dataset. However, there may be other explanations (e.g., availability heuristic) and future research is needed to clarify this. Finally, the size of the administrator sample precluded examination of potential interactions between gender and faculty rank. Thus, we concentrate on the main effect of gender of colloquium chairs and committees. Future research should examine potential moderators.

Despite the limitations, our findings, based on diverse population samples and a mix of methods, as well as archival and cross-sectional data, reveal that, even in disciplines with relative gender parity, female academics give colloquium talks less frequently than do male academics. This gender disparity cannot be attributed to self-selection, but does seem to be influenced by the gender makeup of the chairs and colloquium committees making colloquium talk decisions.

Conclusion

Speakers who visit college and university campuses gain visibility; invitations to share their scholarship at prestigious research institutions; the possibility of collaborations, national prestige, and tangible success, such as promotions and job offers. They also provide young scholars with models of what speakers look like. Women are at a disadvantage compared with men in colloquium presentations. The gatekeepers who constitute colloquium committees can unwittingly favor men. Possible remedies include adding more women as colloquium chairs and to colloquium committees and promoting more deliberate efforts among committees to ensure gender parity in colloquium talk invitations.

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