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Lacking a Voice: Bias against Women as Academic Speakers at Top Universities
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Abstract

Across a wide range of settings, women still face disparities in the workplace relative to men. In the current research, I conduct five studies focusing on academia and examining how gender biases might influence the research presentations heard throughout top academic institutions. Specifically, Study 1 uses archival data to examine colloquia speakers who gave talks in six academic disciplines within the top 50 U.S. colleges and universities in 2013-2014. Results show that women are significantly less likely to be colloquia speakers than are men, even after taking into account the differential number of men and women who get their PhDs and hold academic positions. To eliminate alternative explanations (e.g., women are declining invitations more often than are men), Study 2 results (with a faculty sample) reveal no gender preferences. Then, Study 3 (with a convenience sample) and Study 4 (with a faculty sample) examine individuals’ ratings of manipulated “potential speakers.” Results from Study 3 demonstrate a preference for women when they talk about communal topics and a denigration of women when they talk about agentic topics. Results from Study 4 indicate no preference for women or men. Finally, Study 5 examines whether such differences can be predicted by the gender of the individuals or groups making invitation decisions, and results indicate that a female individual or women in the group positively impacts the number of women speakers who receive invitations. As a whole, this research strongly shows that those who invite and schedule speakers are gatekeepers and can create (or avoid) gender bias.

*academia *gender bias *gatekeepers *colloquia *speakers *talks
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Lacking a Voice: Bias against Women as Academic Speakers at Top Universities

Almost 15 years ago, Virginia Valian (1998) published her “Why So Slow” book and addressed the fact that, despite the passage of Title VII and increases in the equity of women and men going into professional fields, women continued to lag behind men in earnings, promotions, and in gaining positions at the top in virtually all professional disciplines. Recent data confirms that little seems to have changed in the last fifteen years. For instance, as of November 2014, only 26 of the Fortune 500 (5.2%) and 51 of the Fortune 1000 CEOs (5.1%) are female (versus male) CEOs. Data from 2013 show a $420 per week discrepancy in salary between what U.S. female and male lawyers, on average, make (Bureau of Labor Statistics, 2013). In the judiciary branch, there are 56 out of 169 (33.1%) women serving as judges for the Circuit Court of Appeals, and 451 out of 1874 (24.1%) women serving as Federal Court Judges in the U.S.

Academics, often presumed to be a more egalitarian profession, show similar trends. In academia, women in the life sciences earn 23% less than their male counterparts, and there is an overall 14% salary gap between male and female professors (Ginther, 2003). In a study conducted by Wright et al. (2003), specifically looking at the medical field, women earn $12,777 (or 11%) less than men, after adjusting for rank, track, degree, specialty, years in rank, and administrative positions. Of female faculty, 62% were assistant professors (of which 49% were non-tenure eligible), while 55% of men were promoted and tenured. Even in professions in which we assume paradigms of equity, we also find differences.

Valian (1998) attributed many of these lingering disparities to schemas or different stereotypes that people hold about men and women, which in turn lead to substantially different expectations, behavioral confirmations, and workplace trajectories for the genders. In holding such schemas, Valian (1998) cited the fact that people, often unbeknownst to themselves and
others, may be playing the role of gender “gatekeepers” or people who are restricting women from succeeding as much as men by behaving in overt and even more subtle forms of discrimination.

In the current study, I examine gatekeepers in one seemingly small aspect of academia, but an aspect that may have a large amount of impact. In this way, people who play a role in this context may have gatekeeper status in which a gender bias may emerge. More specifically, I am interested in biases that might exist when academics invite and host colloquia speakers to visit. That is, do colloquium chairs and committees invite male versus female academicians more often? And this is the main purpose of the current research, which we examine by conducting five studies.

Professors indicate these important visits on their vitaes and to their scholarship, often take great pride in such invitations, and are reviewed favorably by colleagues and administration when they are asked to speak at reputable colleges and universities across the U.S. The influential role that colloquium invitations can play in one’s career cannot be overemphasized. Such events are an opportunity to publicize one’s research and can lead to collaborations and/or even outside job offers, which themselves can lead to promotions. Indeed, the University of Washington’s law school defines colloquia as “a forum for provocative and innovative legal scholarship and provide an opportunity for faculty to exchange ideas with other scholars, to foster relationships with other institutions, and to collaborate on works in progress” (University of Washington, 2015).

So, the main question we ask in this paper is whether a gender difference exists in the extent to which men and women give colloquia at colleges and universities. To examine this question, we examine the role of gatekeepers more generally. First, I present relevant theories of
Schema (Madera, Hebl, & Martin, 2009; Maranto & Griffin, 2010), Social Role (Gallant & Cross, 1993; Eagly & Johnson, 1990) and Goodness of Fit (Rudman & Glick, 2001; Madera, Hebl, & Martin, 2009; Maranto & Griffin, 2010; Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012), all of which converge in predicting similar outcomes, namely that societal stereotypes suggest that men are more agentic and successful than women in many professional spheres. Then, I specifically consider the context of academia and discuss why examining the incidence of colloquia speakers might be an important arena to examine for gender differences. Finally, I present a summary of the five studies I plan to address, some of which systematically eliminate plausible alternative explanations and examine potential moderating factors for the pattern of data that we observe.

**Gender Discrimination and the Role of Gatekeepers**

Broadly speaking, most people share gender schemas that result in overrating men and underrating women in professional settings, but often such biases are subtle or observable only as presumable “molehills” and not “mountains” of disparity (Valian, 2005). However, over time, these small disadvantages may accumulate, and provide professional men with many more advantages than professional women (Martell, Lane, & Emrich, 1996). Since most individuals are susceptible to these gender schemas, gatekeepers (or others in positions of power) have the ability to make these disadvantages accumulate much more quickly than those individuals who are not in positions of power. Thus, Research Question 1 will be addressed in Study 1,

*RQ1*: We will find more men than women in the distribution of speakers at the top fifty schools (across six departments) than we would expect by chance.

**Schema, Social Role, and Goodness of Fit Theories**
Gatekeepers, or individuals in positions of power who collaborate to select people for finite opportunities, may be guided by previously described gender schemas as proposed by Valian (2005). Additionally, they may be influenced by the Heilman (2001) Lack-of-Fit Theory, which suggests differences in the perceptions people have of working men and women, and often has been used to explain gender bias against women in organizational decisions. This theory focuses on the perceived incongruity between stereotypically-based attributes assigned to women (i.e., kind, caring, and relationship-oriented) and men (i.e., assertive, autonomous, and achievement-oriented), which are believed to be learned from and necessary for success at gender-typed jobs. This theory also gives rise to an expectation that women will perform poorly in male-stereotyped positions—and that the greater the lack of perceived fit the more negative the expectations for women’s performance (Lyness & Heilman, 2006). Further, Heilman and Eagly (2008) emphasize that it is not the negativity of gender stereotypes that has the impact, but the mismatch between these negative gender stereotypes and specific jobs that leads to biased workplace evaluations. Discrimination is the behavioral result when people are asked to make ratings and evaluations. Gatekeepers, then, may be influenced particularly but inadvertently by gender schemas and/or a perceived lack-of-fit between women in some, more overtly, agentic roles and their more stereotypical, feminized, communal attributes. This gives rise to Research Question 2 which will be addressed in Study 1,

*RQ2:* We will find that men give significantly more agentically-themed talks than women, and that women give significantly more communally-themed talks than men, in the distribution of speakers at the top fifty schools (in a subsection of six departments) than we would expect by chance.
There is another relevant theory, that of Social Role Theory, which also proposes role distribution as well as psychological phenomena that may be influencing gatekeepers in these positions of power. Specifically, Eagly and Steffen (1984) discuss the foundational Social Role Theory that offers the underpinnings for the Lack-of-Fit Model. Social Role Theory (Eagly, 1987) involves perceivers who often may observe a particular group of people engaging in a particular activity, and consequently believe that the abilities and personality attributes required to carry out the activity are typical of the group of people being observed (Eagly & Steffen, 1984). For instance, perceivers who constantly observe women caring for children may be more likely to believe that characteristics thought to be necessary for child care, such as nurturance and warmth, are typical of women. Further, the theory goes on to state that certain stereotypes may reflect the distribution of groups into broader aspects of social structure, such as social class. Social role theory is a foundational theory similar to “occupational stereotyping—a preconceived attitude about a particular occupation, about people who are employed in that occupation, or about one’s suitability for that occupation” (Bavishi, Madera, & Hebl, 2010, p.246). Much of the sentiment regarding gender discrimination in the workplace may be unconscious, “embedded in hidden, deeply rooted symbolic structures which amplify action trajectories and ramify them throughout all levels of a given organization” (Gallant & Cross, 1993, p.240). Fallout from this negatively impacts job expectations and hiring procedures. Stereotypes about certain groups can potentially halt career advancement, particularly as individuals unconsciously develop attitudes about the attributes of a group’s members and consequently negatively evaluate them. For example, in a meta-analysis of 96 studies of the effectiveness of leaders by Eagly, Karau, and Makhigani (1995), men fared better than women in male-dominated leadership roles or culturally masculine settings but women surpassed men in
settings that were less male dominated or less culturally masculine (Heilman, & Eagly, 2008). Consequently, in Study 3 we hypothesize:

*H1a:* Participants, when presented with an advertisement for a speaker (including gender, talk title, and department), will engage in gatekeeping or the selection of men significantly more often than women as speakers.

**Agentic and communal attributes.** Further, in a study conducted by Rudman and Glick (2001), participants evaluated video recorded applicants for a job description and rated applicants on characteristics of competence, social skills, and hireability. Findings replicated past research, demonstrating that an agentic female applicant was rated as less socially skilled and likeable than an identically presented man. The female also was viewed as less hireable for a managerial job than her male counterpart. This seems to have legitimize discrimination based upon prescriptive gender stereotypes. Devaluation of the female applicant’s social skills (and not her competence) mediated this gender discrimination effect. Agentic female applicants were discriminated against because they were viewed as “not nice,” whereas the male applicant’s social skills and hireability were negligibly affected by his dominating style. So, a female applicant who presented as both nice and competent was not discriminated against. However, this results in women having to maintain a bilingual impression of themselves (nice and able) in order to not be perceived as overbearing and dominant. This manifests as a delicate form of impression management that could create anxieties which may undermine task performance. Similar to what was previously described regarding Lack-of-Fit, when there is incongruity between stereotypically-based attributes assigned to women (i.e., kind, caring, and relationship-oriented) and male-stereotyped jobs—the greater the lack of this perceived fit the more negative
the expectations for women’s performance (Lyness & Heilman, 2006). Thus, we also predict in Study 3,

**H1b:** Participants will be more likely to rate female speakers who talk about communal topics (i.e., relationships) higher on talk interest and speaker competence than male speakers talking about communal topics, and more likely to rate female speakers who talk about agentic topics (i.e., control) lower on talk interest and speaker competence than male speakers talking about agentic topics.

**Gatekeeping in Academia**

In academia, these gatekeepers may include faculty members on hiring/search committees, faculty members on promotion and tenure (P&R) committees, journal reviewers (when papers are not reviewed blindly), grant reviewers (when grants are not reviewed blindly), and faculty members who invite other faculty members to their respective universities for talks (those who serve on colloquia committees). More broadly referring back to gatekeeping in academia, social role theory (Eagly, Wood, & Diekman, 2000) provides a useful framework for understanding why it is possible that female professors might be evaluated more negatively than male professors. Women are expected to behave in communal ways (i.e., being concerned with the welfare of other people, being affectionate, kind, and sensitive) whereas men are expected to be agentic (i.e., being concerned with getting ahead, being aggressive, assertive and independent). In the workplace, communal qualities are perceived to be less important and positive than agentic qualities (Bavishi, Madera, & Hebl, 2010; Madera, Hebl, & Martin, 2009). Findings in Steinpreis, Anders, and Ritzke (1999) found that CVs labeled “male” were rated higher than those labeled “female,” despite the fact that the vitaes were identical. Academia remains a male-dominated occupation—therefore it is likely to be perceived more appropriate for
a man than for a women (Bavishi, Madera, & Hebl, 2010). Female-dominated fields in academia tend to be undervalued. Accordingly, in Study 4, we predict that we will replicate the findings in Study 3.

Thus, gatekeepers may be influenced by gender schemas, a perceived lack-of-fit between female academics and their area of study (as well as just their general occupation), and these social roles, which cause them to attribute group membership to anyone with characteristics they have observed previously in members of a specific group. Further, there remains significant evidence documenting the barriers and marginalization women face in academia including high levels of social isolation, slower rates of advancement, and a greater lack of academic mentors (Bavishi, Madera, & Hebl, 2010). Stereotypes that men are good at some things and women are good at others permeate the workplace. Discrimination and sexism against women still exist and women still experience a variety of incivilities.

It is important to note that it is not just men denigrating female more than male targets: rather, it is both male and female perceivers who denigrate women more than men (e.g., Elg & Jannergård, 2003). Studies have demonstrated the difficulty involved in attempting to alter these evaluations, even within academia (Elg & Jannergård, 2003). Glick and Fiske (1996) show that both men and women are equally likely to hold stereotypes and negative attitudes toward women. Thus, I believe that gatekeepers of women’s equity will consist of both men and women. Consequently, in Studies 3 and 4 we predict,

\( H2: \) Participants who are higher on prejudice toward women will be particularly more likely to “gatekeep” and select men than will those low on prejudice toward women.

Further,
**H3:** The relation between prejudice of participants and exhibited discrimination will be moderated by whether the speaker’s research area is more feminine (communal) or masculine (agentic). In particular, gatekeepers who are prejudiced, relative to all other comparison groups, are perceived to rate female speakers giving communal talks the lowest on talk interest and speaker competence and masculine speakers giving agentic talks the highest on talk interest and speaker competence.

**Agentic and communal attributes and hireability in academia.** Specifically, characteristics that are particularly attributed to women and men, respectively, can have a profound impact on career opportunities and trajectories. Turning to the empirical research examining gender in the context of academia, two studies conducted by Madera, Hebl, and Martin (2009) examined letters of recommendation for academia to see if they were written differently for men and women and whether those potential differences influenced selection decisions in academia. Letters of recommendation have been found to be some of the most important metrics used to screen and evaluate applicants for internships, graduate programs, medical schools, military training programs, and psychology faculty positions (Madera, Hebl, & Martin, 2009). The first study confirmed that female applicants were described with communal terms (i.e., affectionate, warm, kind, and nurturing) more often than were their male counterparts. The letters of recommendation for women versus men also mentioned more social-communal terms (i.e., student(s), child, relative, and mother). As expected, men were more likely to be described in agentic terms (i.e., ambitious, dominant, and self-confident) than were women. The second study examined whether the differences in agentic and communal characteristics influenced hiring decisions in academia. According to experts in the field, academic positions for research-oriented universities require more masculine and less communal traits. Subsequently,
agentic characteristics in applicants positively related to hiring ratings and the communal characteristics of applicants were related negatively to hireability ratings (Madera, Hebl, & Martin, 2009). Further, the results exhibited that communal ratings mediated the relationship between applicant gender and hireability ratings for a research-oriented university. The results for agency were not as distinct; there was no significant effect for a positive relationship between hireability and agency. However, the findings still showed that women are described as more communal and less agentic than men and that communal characteristics have a negative relationship with hiring decisions in academia.

**Competence and hireability in academic science.** In a study conducted by Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman (2012), science faculty members across the biology, chemistry, and physics departments rated application materials for completely identical male and female candidates (other than gender) for a lab manager position. The candidates were positioned as undergraduate science students who were applying to work in a science laboratory manager position. Both male and female faculty members consistently rated the male candidate as both more competent and hireable than the female applicant. Further, both male and female faculty members offered the female candidate a smaller salary and less career mentoring than the male applicant. Finally, the candidates’ competence ratings mediated the relationship between gender and hireability ratings. So, even looking at a subset of academia, there is further evidence that females with the exact same credentials as men are being unfairly penalized.

**Informal networks and discrimination in academia.** Looking specifically at tenure-track faculty, Maranto and Griffin (2010) surveyed faculty at a private Midwestern university and found that women perceived greater exclusion than did men from informal networks of their academic departments. Even when other antecedents of a “chilly” organizational climate were
added to the model (including the percentage of women in the department, procedural fairness, and gender equity), gender remained a significant predictor of exclusion. This suggests even as departments experience more gender balance, women still may perceive exclusion from informal department networks. This exclusion was posited to be a powerful barrier to achievement given the role informal collaboration and mentoring has on measures of success (e.g., publications). Further, men’s perception of exclusion from their department was unaffected by the proportion of women faculty, which conforms to research indicating that men are advantaged even in situations in which they are tokens.

Summary

This cumulative theory and research suggests that gender-role spillover, or the carryover into the workplace of gender-based expectations for behavior exists (Eagly & Johnson, 1990). Gender roles may pollute organizational roles to some extent and cause people to have different expectations for female and male managers. University women described as effective female (as opposed to male) leaders, had higher levels of both the interpersonally-oriented and task-oriented aspects of leadership (Eagly & Johnson, 1990). So, gender social roles still define competence in leadership positions, at least to a certain extent.

Research conducted in academia seems to provide support for each of the three theories presented here: gender schemas (Madera, Hebl, & Martin, 2009; Maranto & Griffin, 2010), the Lack-of-Fit model (Rudman & Glick, 2001; Madera, Hebl, & Martin, 2009; Maranto & Griffin, 2010; Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012), and Social Role theory (Gallant & Cross, 1993; Eagly & Johnson, 1990). Each of these theories, clearly supported by previous research, influence the formulation of the hypotheses for the current research.

Current Research
Across five studies, the current research will document if (and the extent to which) there is a gender difference among academic speakers who give talks at the top 50 universities in the country (Study 1). Then, in Study 2, this research will ensure that this difference is not due to women declining more invitations than men. Then, two studies document whether general audience members (Study 3) and academic faculty members (Study 4) show biases in the extent to which they would evaluate and want to hear male versus female speakers. Finally, Study 5 examines the extent to which predictors (gender, decision made by individual or committee) might influence the extent to which men versus women are chosen as speakers.

**Study 1**

**Participants**

Although this study was archival, participants could be categorized as any speaker who was invited to give a talk in one of six disciplines (biology, bioengineering, history, psychology, sociology, and political science) at one of the top 50 colleges and universities in the U.S as documented by U.S. News and World Report 2013-2014. This resulted in 5,293 speakers.

**Methods**

To provide a conservative test of our hypothesis, we examined fields of specialty that had more (versus less) parity in the distributions of men and women. To do this, we consulted a guide with published information broken down by gender on the number of PhDs who graduated in the U.S. in 2011 (Rice University, 2013). A total of 30 research assistants coded all of the speakers who gave talks listed on the university websites under the seminars and events pages for the six different disciplines at the top 50 colleges and universities throughout the 2013-2014 academic year. In addition, research assistants recorded the name of each speaker’s talk and 2 independent coders rated them on the extent to which the talk titles were communal/feminine.
(i.e., concerned with the welfare of other people, affectionate, kind, and sensitive) and agentic/masculine (i.e., concerned with getting ahead, aggressive, assertive and independent)

(Likert Scale, 1-Extremely agentic, 4-Neither agentic nor communal, 7-Extremely communal).

There was 88% agreement between coders.

Results

The results show a stark difference in the extent to which men versus women give talks at colleges and universities. Specifically, supporting Research Question 1, men gave significantly more talks overall (67%, $M = 3,579$) than did women (33%, $M = 1,736$), $\chi^2 (1) = 329.1$, $p < .001$, $\phi = .49$. Also, in accordance with Research Question 2, the ratings of the talks show that men also gave significantly more agentically-themed talks than did women, ($M_{men} = 3.68$, $SD_{men} = 1.20$) versus ($M_{women} = 3.84$, $SD_{women} = 1.24$), $t (4293) = 3.06$, $p = .002$, $d = .14$ (on a 7-point Likert scale where 1 = ”Extremely agentic” and 7 = ”Extremely communal”). Figure 1 demonstrates the observed totals of men and women across each department.

Department. To assess comparisons of the talks that men and women gave, we used the actual distribution and compared it with three different sets of statistics. First, one might examine whether ratios differed significantly from an expectation that half of talks would be given by men and the other half from women. Thus, using a liberal litmus test of gender parity, we used six Chi-square tests to compare the expected numbers (based on 50/50 representation) with the actual observed number of faculty members of each gender in each of these departments. These are also presented in Table 1, although I will discuss each in detail. For Bioengineering, there were 818 total faculty in our sample. Given a 50/50 split, we expected to observe 409 males and 409 females if there were no biases. Results revealed a male representation of 77% (631 male faculty) and a female representation of 23% (187 female faculty). When compared to observed
totals, the Chi-square was significant, $\chi^2 (1) = 130.08, p < .001, \phi = .40$. For Biology, there were 1,683 total faculty in our sample. Given a 50/50 split, we expected to observe 842 males and 842 females if no biases emerged. Results revealed a male representation of 71% (1,193 male faculty) and a female representation of 29% (490 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 153.56, p < .001, \phi = .30$. For Political Science, there were 777 total faculty in our sample. Given a 50/50 split, we expected to observe 389 males and 389 females if no biases emerged. Results revealed a male representation of 70% (536 male faculty) and a female representation of 30% (241 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 58.13, p < .001, \phi = .27$. For Psychology, there were 640 total faculty in our sample. Given a 50/50 split, we expected to observe 320 males and 320 females if no biases emerged. Results revealed a male representation of 62% (396 male faculty) and a female representation of 38% (244 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 18.31, p < .001, \phi = .17$. For Sociology, there were 516 total faculty in our sample. Given a 50/50 split, we expected to observe 258 males and 258 females if no biases emerged. Results revealed a male representation of 55% (285 male faculty) and a female representation of 45% (231 female faculty). When compared to observed totals, the Chi-square was not significant, $\chi^2 (1) = 2.83, p = .09, \phi = .07$. For History, there were 880 total faculty in our sample. Given a 50/50 split, we expected to observe 440 males and 440 females if there were no biases. Results revealed a male representation of 61% (537 male faculty) and a female representation of 39% (343 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 21.65, p < .001, \phi = .16$.

Second, we used a more conservative test. That is, critics might note that the distribution of men and women going into faculty positions, even in the fields we chose which most closely
approximate parity, are still not equitable and the leaky pipeline works to encourage disparities in the number of men and women who gain their Ph.Ds. Hence, in a second analysis we compared the speakers chosen with the actual ratio of Ph.D recipients who graduated in each of the fields, with the most recent data available. Both sets of these comparisons show a reduced but still significant pattern of results that mirrors those used with the 50:50 ratios. That is, as shown in Table 1, nine of the twelve comparisons were significant.

Using a tier 1 university example, we utilized the number of PhDs broken down by gender who graduated by department in 2010; thus, we had an expected ratio of men to women. We ran six Chi-square tests to compare the expected numbers (based on these reported percentages) with the actual observed values. The Bioengineering field is comprised of 38% female and 62% male PhD recipients. Given these expected percentages, we expected to observe 311 females and 507 males in our sample if there was no bias. When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 44.39, p < .001, \phi = .23$. The Biology field is 47% female and 53% male. Given these expected percentages, we expected to observe 791 females and 892 males in our sample. When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 114.18, p < .001, \phi = .26$. The Political Science field is 40% female and 60% male. Given these expected percentages, we expected to observe 311 females and 466 males in our sample. When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 13.77, p < .001, \phi = .13$. The Psychology field is 67% female and 33% male. Given these expected percentages, we expected to observe 429 females and 211 males. When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 107.24, p < .001, \phi = .41$. The Sociology field is 61% female and 39% male. Given these expected percentages, we expected to observe 315 females and 201 males. When compared to observed totals, the Chi-square was significant, $\chi^2 (1)$
= 27.44, \( p < .001, \phi = .23 \). The History field is 45% female and 55% male. Given these expected percentages, we expected to observe 396 females and 484 males. When compared to observed totals, the Chi-square was significant, \( \chi^2 (1) = 6.55, p = .01, \phi = .08 \).

Third, an even more conservative test to conduct in examining biases in speaker invitations would be to use the available distributions of male and female faculty at a typical Tier 1 Research University for each of the respective fields. Using Tier 1 university distributions from 2012 (Rice University, 2013), we examined whether the ratio of men to women selected to give talks reflected this. We ran six Chi-square tests to compare the expected numbers (based on the distributions present at a Tier 1 institution) with the actual observed values. The Tier 1 Bioengineering field had 40% female faculty and 60% male faculty; thus, we would have expected to observe 327 female faculty and 491 male faculty in our sample if no further bias existed. When compared to observed totals, the Chi-square was significant, \( \chi^2 (1) = 55.60, p < .001, \phi = .26 \). The Tier 1 Biology Department had 32% female faculty and 68% male faculty; thus, we would have expected to observe 539 female and 1,144 male faculty if no further bias existed. When compared to observed totals, the Chi-square was not significant, \( \chi^2 (1) = 3.36, p = .07, \phi = .04 \). The Tier 1 Political Science Department had 19% female faculty and 81% male faculty; thus, we would have expected to observe 148 females and 629 males if no further bias existed. When compared to observed totals, the Chi-square was significant, \( \chi^2 (1) = 29.66, p < .001, \phi = .20 \). The Tier 1 Psychology Department had 36% female faculty and 64% male faculty; thus, we would have expected to observe 230 female and 410 male faculty if no further bias existed. When compared to observed totals, the Chi-square was not significant, \( \chi^2 (1) = .657, p = .418, \phi = .03 \). The Tier 1 Sociology Department is comprised of 58% female faculty and 42% male faculty. We would expect to observe 300 females and 217 males if no further bias existed.
When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 18.18$, $p < .001$, $\phi = .19$. The Tier 1 History Department had 36% female and 42% male faculty; thus, we would have expected to observe 317 female and 563 male faculty if no further bias existed. When compared to observed totals, the Chi-square was not significant, $\chi^2 (1) = 1.64$, $p = .20$, $\phi = .04$.

Finally, if the previous analyses imposing documented distributions of men and women in these fields on our data is still not convincing, we also performed Chi-square tests based on the actual distribution of male and female speakers in our data. We did this utilizing the base rate of women (33%) versus men (67%) actually in our data. When comparing our observed totals to what we would expect, based on the general distribution of men and women in our data set, looking across the six programs the Chi-square is significant, $\chi^2 (5) = 105.3$, $p < .001$, $\phi = .14$.

Further, when looking at each comparison individually, by program, two comparisons were significant in the correct direction (Biology: Expected women = 550, Observed women = 490; Bioengineering: Expected women = 267, Observed women = 187). One comparison was not significant, but it was in the expected direction (Political Science: Expected women = 254, Observed women = 241). And the final three comparisons were significant, but in the opposite direction that we anticipated (Psychology: Expected women = 209, Observed women = 244; Sociology: Expected women = 169, Observed women = 231; History: Expected women = 288, Observed women = 343). Please refer to Figure 1 for a graphical display of men and women distributed across each department.

**Faculty Rank**

Further, when examining whether ratios differed significantly from an expectation that half of talks would be given by men and the other half from women, we additionally looked across three faculty ranks: assistant, associate, and full professor. Thus, using a liberal litmus test
of gender parity, we conducted eighteen Chi-square tests (each department, across every faculty rank) to compare the expected numbers (based on 50/50 representation) with the actual observed number of faculty members of each gender in each of these departments. These are presented in Table 2, although we again discuss each in detail. For Bioengineering at the assistant level, there were 158 total faculty in our sample. Given a 50/50 split, we expected to observe 79 males and 79 females if there were no biases. Results revealed a male representation of 76% (120 male faculty) and a female representation of 24% (38 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 22.8, p < .001, \phi = .35$. For Bioengineering at the associate level, there were 188 total faculty in our sample. Given a 50/50 split, we expected to observe 94 males and 94 females if there were no biases. Results revealed a male representation of 76% (143 male faculty) and a female representation of 24% (45 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 27.4, p < .001, \phi = .42$. For Bioengineering at the full professor level, there were 326 total faculty in our sample. Given a 50/50 split, we expected to observe 163 males and 163 females if there were no biases. Results revealed a male representation of 84% (273 male faculty) and a female representation of 16% (53 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 83.8, p < .001, \phi = 1.3$.

For Biology at the assistant level, there were 314 total faculty in our sample. Given a 50/50 split, we expected to observe 157 males and 157 females if there were no biases. Results revealed a male representation of 64% (202 male faculty) and a female representation of 36% (112 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 13.17, p < .001, \phi = .20$. For Biology at the associate level, there were 350 total faculty in our sample. Given a 50/50 split, we expected to observe 175 males and 175 females if there were no
biases. Results revealed a male representation of 70% (244 male faculty) and a female representation of 30% (106 female faculty). When compared to observed totals, the Chi-square was significant, χ² (1) = 28.3, p < .001, φ = .44. For Biology at the full professor level, there were 622 total faculty in our sample. Given a 50/50 split, we expected to observe 311 males and 311 females if there were no biases. Results revealed a male representation of 79% (492 male faculty) and a female representation of 21% (130 female faculty). When compared to observed totals, the Chi-square was significant, χ² (1) = 115.1, p < .001, φ = 1.8.

For Political Science at the assistant level, there were 165 total faculty in our sample. Given a 50/50 split, we expected to observe 83 males and 83 females if there were no biases. Results revealed a male representation of 64% (105 male faculty) and a female representation of 36% (60 female faculty). When compared to observed totals, the Chi-square was significant, χ² (1) = 6.2, p = .01, φ = .10. For Political Science at the associate level, there were 134 total faculty in our sample. Given a 50/50 split, we expected to observe 67 males and 67 females if there were no biases. Results revealed a male representation of 63% (85 male faculty) and a female representation of 37% (49 female faculty). When compared to observed totals, the Chi-square was significant, χ² (1) = 4.9, p = .03, φ = .08. For Political Science at the full professor level, there were 323 total faculty in our sample. Given a 50/50 split, we expected to observe 162 males and 162 females if there were no biases. Results revealed a male representation of 75% (242 male faculty) and a female representation of 25% (81 female faculty). When compared to observed totals, the Chi-square was significant, χ² (1) = 42.8, p < .001, φ = .66.

For Psychology at the assistant level, there were 117 total faculty in our sample. Given a 50/50 split, we expected to observe 59 males and 59 females if there were no biases. Results revealed a male representation of 58% (68 male faculty) and a female representation of 42% (49
female faculty). When compared to observed totals, the Chi-square was not significant, $\chi^2 (1) = 1.6, p = .21$. For Psychology at the associate level, there were 132 total faculty in our sample. Given a 50/50 split, we expected to observe 66 males and 66 females if there were no biases. Results revealed a male representation of 57% (75 male faculty) and a female representation of 43% (57 female faculty). When compared to observed totals, the Chi-square was not significant, $\chi^2 (1) = 1.2, p = .3$. For Psychology at the full professor level, there were 240 total faculty in our sample. Given a 50/50 split, we expected to observe 120 males and 120 females if there were no biases. Results revealed a male representation of 69% (165 male faculty) and a female representation of 31% (75 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 17.5, p < .001, \phi = .27$.

For Sociology at the assistant level, there were 108 total faculty in our sample. Given a 50/50 split, we expected to observe 54 males and 54 females if there were no biases. Incredibly, results revealed an exact male representation of 50% (54 male faculty) and a female representation of 50% (54 female faculty). When compared to observed totals, the Chi-square was not significant, $\chi^2 (1) = 0$. For Sociology at the associate level, there were 101 total faculty in our sample. Given a 50/50 split, we expected to observe 51 males and 51 females if there were no biases. Results revealed a male representation of 49% (49 male faculty) and a female representation of 51% (52 female faculty). When compared to observed totals, the Chi-square was not significant, $\chi^2 (1) = 0.04, p = .8$. For Sociology at the full professor level, there were 226 total faculty in our sample. Given a 50/50 split, we expected to observe 113 males and 113 females if there were no biases. Results revealed a male representation of 62% (139 male faculty) and a female representation of 38% (87 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 6.1, p = .01, \phi = .09$. 
For History at the assistant level, there were 123 total faculty in our sample. Given a 50/50 split, we expected to observe 62 males and 62 females if there were no biases. Results revealed a male representation of 54% (67 male faculty) and a female representation of 46% (56 female faculty). When compared to observed totals, the Chi-square was not significant, $\chi^2 (1) = .49, p = .48$. For History at the associate level, there were 226 total faculty in our sample. Given a 50/50 split, we expected to observe 113 males and 113 females if there were no biases. Results revealed a male representation of 59% (133 male faculty) and a female representation of 41% (93 female faculty). When compared to observed totals, the Chi-square was not significant, $\chi^2 (1) = 3.6, p = .059$. For History at the full professor level, there were 359 total faculty in our sample. Given a 50/50 split, we expected to observe 180 males and 180 females if there were no biases. Results revealed a male representation of 67% (239 male faculty) and a female representation of 33% (120 female faculty). When compared to observed totals, the Chi-square was significant, $\chi^2 (1) = 20.3, p < .001, \phi = .31$.

**Study 1 Discussion**

This study clearly shows preliminary evidence that men are giving more talks at the top 50 universities than are women. This is evident across the six fields, it is evident even when the ratio comparisons are made to be conservative, it is evident when utilizing the distribution from our own data set, and it is evident when looking across faculty rank.

Specifically, when using 50:50 ratios as our expected values, every comparison between expected and observed was significant across the 6 departments, except for Sociology. This is because the actual distribution of females from our data set into Sociology was at 45%, which was not different enough from this imposed ratio to be significant. However, across both the imposed PhD graduate ratios (61%) and faculty ratios (58%), the distribution of females in our
data set into Sociology was significantly lower than we would have expected. Specifically, this is because the female representation among PhD graduates and faculty members in Sociology is much higher than 50%: (For more details please refer to Table 2.)

When we used the ratios for PhD graduates as our expected values, every comparison across each department was significant. In every single case, there were fewer females distributed in each department than we would have expected by chance, based on the proportion of male and female PhDs in each field.

Next, when we used the ratios for faculty members, three out of six comparisons were still significant: Bioengineering (40%), Political Science (19%), and Sociology (58%). In only one case was the actual representation higher than expected by chance—Political Science.

When we used the base rates from our own sample, two comparisons were still significant in the expected direction (Biology and Bioengineering), and although one comparison was not significant (Political Science), it was still in the correct direction. Although, Psychology, Sociology, and History had more female speakers than we would have expected, using our own sample’s ratio of women, these fields tend to be viewed as generally more communal than the other three—and this may account for this difference. Additionally, when dissecting our data by faculty rank, Full Professors in these fields are still dominated by men significantly more than women. This discrepancy was observed across all three faculty ranks in bioengineering, biology, and political science departments, thus this discrepancy seems to persist across ranks in half of the departments we investigated. For more information on each of these comparisons, please refer to Table 2.

One of the criticisms of this study, however, is that it is not certain *why* men are giving more talks. While I have posed that it is the work of gatekeepers, another explanation may be
that women are taking themselves out of talk contention. That is, maybe they are getting the same number of invitations, but they are just choosing to decline at higher rates than are men. Regarding Study 2 we propose:

\[ H5: \text{Men decline talk invitations at a rate that is significantly lower than women.} \]

Additionally, it could be that giving talks at prestigious universities is not as important to women as it is to men. Consequently:

\[ H6: \text{Men think talk invitations are significantly more important than women.} \]

Thus, we conducted Study 2 with faculty members to examine if either of these explanations could account for the discrepancies we observed in Study 1.

**Study 2**

**Faculty Colloquium Invitations and Department Colloquia Procedures**

In an effort to examine further the number of invitations female faculty members receive versus men, and to generally get a better picture of the factors at play when faculty are invited to give talks, we surveyed a portion of the faculty members identified in Study 1.

**Participants.** We e-mailed 989 faculty members that we had identified from Study 1, and asked them to take an 11 question survey regarding colloquia talk invitations they had received in the last calendar year (2013-2014). A total of 188 participants, 121 (64%) of whom were male and 67 (36%) of whom were female participated in this study. This was a 19% response rate.

**Methods.** We asked faculty members eleven questions: (1) If they would consent, (2) How many invited talks did you give at top 50 universities in the U.S. last year (2013-2014), (3) How many invited talks did you turn down (2013-2104), (4) If you turned down invited talks, why did you turn them down, (5) How important is it to you to try and accept invited talk opportunities (Likert Scale, 1-Not Important, 5-Very Important), (6) Please rate how strongly
you agree with the following statements (Likert Scale, 1-Do not agree, 5-Completely agree): (a) I try to go to every place I’m invited to talk, (b) Going to places to give invited talks is important to me, (c) I avoid going to places to give invited talks because of family obligations, (d) Going to places to give invited talks helps my career, (7) What universities did you speak at in the last academic year (Fall 2013 - Spring 2014), (8) What universities were you invited to speak at which you did NOT in the last academic year (Fall 2013 - Spring 2014), (9) What is your gender (male/female), (10) What race/ethnicity best describes you (American Indian/Alaskan Native, Asian/Pacific Islander, Black/African American, Hispanic American, and White/Caucasian), (11) What department are you affiliated with (History, Psychology, Bioengineering, Political Science, Psychology, and Sociology).

**Results.** In terms of Hypothesis 5, there was no significant difference in the number of times that women declined invited talks versus men (Women, $M = .81, SD = 1.3$; Men, $M = .66, SD = 1.3$). Further, running a one-way ANOVA by gender to examine Hypothesis 6, there was no significant difference in the importance women and men award to giving invited talks as a whole composite (Women, $M = 3.87, SD = .86$; Men, $M = 3.76, SD = .83$; $F(1, 186) = .68, p = .41$) Finally, there was no significant difference in the importance women and men awarded to giving talks at the item level (Item 1: “I try to go to every place I’m invited to talk,” Women, $M = 3.7, SD = 1.4$, Men, $M = 3.7, SD = 1.38$; Item 2: “Going to places to give invited talks is important to me,” Women, $M = 4.1, SD = 1.1$, Men, $M = 4.03, SD = 1.05$; Item 3 (reverse-coded): “I avoid going to places to give invited talks because of family obligations,” Women, $M = 3.52, SD = 1.3$, Men, $M = 4.0, SD = 1.13$; Item 4: “Going to places to give invited talks helps my career,” Women, $M = 4.13, SD = 1.03$, Men, $M = 4.01, SD = 1.13$). Thus, women are not
declining more invited talks than men, and there is no difference in the importance of attending invited talks between women and men.

**Study 2 Discussion.** Subsequent to this study, it cannot be argued that the discrepancy between women and men giving invited talks is due to women turning down more talks (Hypothesis 5) or women not thinking giving invited talks is as important as men (Hypothesis 6). One of the criticisms of the previous two studies, however, is that the first is archival data and the second is self-report, and neither is experimental. Thus, the next study will experimentally show that given a choice for a male or female speaker, gatekeepers will choose a male over a female speaker (Hypothesis 1). We also believe that this will be accentuated when the talk is about agentic versus communal topics (Hypothesis 2).

Thus, given the important results previously presented, it next becomes crucial to explore how they arise. That is, they may be the result of colloquia chairs or committees catering to what the faculty themselves expressly would like. Hence, we conduct studies on two sets of participants, both audience members (Study 3) and faculty members (Study 4) to see if they indicate a preference for hearing male versus female speakers. This can be done by presenting audience and faculty members with ostensible speakers and asking them to rate their desire to invite the speaker and attend such a talk. Additionally, we also can manipulate the talk titles to be more or less communal and agentic to see if, again in sync with the Lack-of-Fit Model, the evaluations are more favorable with agentic titles, and particularly when these agentic titles are being delivered by men (versus women).

**Study 3**

**Participants**
We recruited community members (academics and non-academics) through Amazon’s Mechanical Turk™ and snowball sampling techniques using the networks of undergraduate lab members and those of graduate students at a small, private, southwestern university. This resulted in a sample of 686 community members. Of these, 241 participants (35%) were male and 445 (65%) were female.

**Methods**

This study is an electronic survey advertising a local university talk. When advertising this talk, the gender of the speaker (male, female) is manipulated, as is the type of talk given (communal, agentic) and three content areas the talk is given in (history, psychology, and bioengineering). We only used three out of the six possible departments to reduce the complexity of the design. An example of the content of this type of advertisement is: “The Bioengineering Department would like to present: It’s All about Cooperation: Computer Wearable Designs that Improve Communication in Medical Treatments, a colloquium given by: Dr. Christina Smith, Associate Professor of Bioengineering, University of Illinois, May 22\textsuperscript{nd}, 2014, Time: TBA.” The manipulation of gender is as parallel as possible: Dr. Christopher Smith versus Dr. Christina Smith. The manipulation of the talk title is as parallel as possible: all talks start with the phrase “It’s All about Cooperation” (communal condition) or alternatively “It’s All about Control” (agentic condition). Finally, the exact same procedure is followed across each department and condition. There are four conditions for every content area: Content Area-Female-Communal, Content Area-Female-Control, Content Area-Male-Agentic, and Content Area-Male-Control. This results in 12 different conditions (four for each of the three programs).

**Measures**
**Talk Interest.** Participants also answer a number of questions regarding their feelings about hearing the talk and their impression of the speaker. Regarding the Talk Interest dependent variable composite, participants are asked to rate how they would feel about hearing the talk (Likert Scale, 1-Strongly Disagree, 4 – Neither Disagree nor Agree, 7-Strongly Agree) across 7 items: (a) “I would like to go to this talk,” (b) “This talk would be really interesting to me,” (c) “Most people would probably find this talk interesting,” (d) “I would volunteer to make this talk happen,” (e) “I would really dislike going to this talk” (reverse-coded), (f) “I would probably be bored at this talk” (reverse-coded),” (g) “I feel this talk would be a waste of my time” (reverse-coded). This composite had a Cronbach’s Alpha of .92.

**Speaker Competence.** Second, participants are asked to rate how they would feel about the speaker (Likert Scale, 1-Strongly Disagree, 4 – Neither Disagree nor Agree, 7-Strongly Agree) across 10 items: (a) “The speaker is excellent,” (b) “The speaker is smart,” (c) “The speaker is prestigious,” (d) “The speaker is well-trained,” (e) “The speaker would give a great talk,” (f) “The speaker would be interesting,” (g) “The speaker would be boring” (reverse-coded), (h) “The speaker would be kind,” (i) “The speaker would be competent,” (j) “The speaker would have important things to say.” This composite had a Cronbach’s Alpha of .90.

**Ambivalent Sexism Scale.** Third, participants are given the Ambivalent Sexism Scale (Glick & Fiske, 1996), which measures participants’ ambivalent sexism (defined as, simultaneously holding two sets of related sexist beliefs: hostile and benevolent sexism) in a 22-item questionnaire which includes two scores, one for hostile and one for benevolent sexism (Glick & Fiske, 1996). A sample question includes: “Most women interpret innocent remarks or acts as being sexist” (Likert scale, 1-Strongly Disagree to 7-Strongly Agree).
**Gender Norm Attitudes Scale.** Fourth, participants take the Gender Norm Attitudes Scale measures participants’ egalitarian beliefs about male and female gender norms (and measures prejudice) (Waszak, Severy, Kafafi, & Badawi, 2000). A sample question includes: “It is important that sons have more education than daughters” (Likert scale, 1-Strongly Disagree to 7-Strongly Agree).

Finally, participants completed manipulation checks to ensure they remembered the gender of the speaker, the talk title, and the type of event advertised. We also asked participants for their (a) gender, (b) ethnicity, (c) age, and (d) job title. The complete survey for one of the conditions is included in Appendix A.

**Results**

Regarding Hypothesis 1a, that participants will rate men higher than women as speakers, I first conducted a 2 x 2 x 3 factorial ANOVA on the Talk Interest Composite, using gender (male/female), talk title (agentic/communal), and department (history/psychology/bioengineering) as the independent variables. The main effect of Gender was not significant, but in support of Hypothesis 1b, I found a significant interaction of Gender and Talk Title, $F(1,720) = 5.03, MSE = 1.5, p = .025, \eta^2 = .007$. Specifically, women who spoke about relationships were awarded higher ratings on the Talk Interest Composite when compared to men who spoke about relationships (Women, $M = 4.56, SE = .09$; Men, $M = 4.45, SE = .09$). Further, as shown in Figure 2, men who spoke about control were given higher ratings on the Talk Interest composite when compared to women who spoke about control (Women, $M = 4.16, SE = .08$; Men, $M = 4.35, SE = .07$). In a follow-up t-test examining Gender grouped by talk title (agentic/communal), neither comparison was significant.
Further regarding Hypothesis 1a, a 2 x 2 x 3 factorial ANOVA on the Speaker Competence Composite, using gender, talk title, and department as the independent variables, revealed no significant main effect of gender. However, in support of Hypothesis 1b, the results revealed a marginally significant interaction of Gender and Talk Title, $F(1, 720) = 3.62, MSE = .82, p = .057, \eta^2 = .005$. Referring to Figure 4, again women who spoke about relationships were rated as having more interesting talks than men who spoke about relationships (Women, $M = 5.02, SE = .08$; Men, $M = 4.82, SE = .08$). And again, men who spoke about control were rated as having more interesting talks than women who spoke about control (Women, $M = 4.83, SE = .07$; Men, $M = 4.89, SE = .06$). A follow-up t-test on both dependent variables, examining Gender grouped by talk title (agentic/communal), revealed that in the communal talk title condition when looking at the Speaker Competence Composite, the difference by gender was significant $t(315) = 2.43, p = .016$. When conducting a 2 x 2 x 2 factorial ANOVA on the Talk Interest Composite, with Speaker Gender, Talk Title, and Participant Gender as the independent variables, there were no significant effects of participant gender.

Regarding Hypothesis 2, that participants who are higher on prejudice toward women will generally prefer male speakers than will those low on prejudice toward women, I conducted a simple linear regression analysis to determine if the Talk Interest and Speaker Competence composites could be predicted from the ASI or GNS. The results were significant, and referring to Figure 5, suggest that a significant proportion of the Talk Interest Composite was predicted by participants’ scores on the GNS, $t(685) = 2.1, \beta = -.12, p = .038, R^2 = .006$. The 95% confidence interval is (-.22, -.006).

Then, I regressed ASI on the Talk Interest Composite. The results were marginally significant, suggesting that a marginal proportion of the Talk Interest Composite was predicted
by participants’ scores on the ASI, as shown in Figure 6, \( t(698) = 1.79, \beta = -.08, p = .074, R^2 = .005 \). The 95% confidence interval is (-.16, .007). Then, I conducted the same linear regression analysis on the speaker competence composite, using GNS scores and then ASI scores as the predictors. Neither analysis was significant: GNS, \( t(685) = .33, p = .74 \); ASI, \( t(698) = 1.6, p = .11 \).

Then, regarding Hypothesis 3, to see if the relation between participant prejudice and exhibited discrimination will be moderated by the talk title, I conducted a multiple regression analysis of both ASI and talk title on the Talk Interest Composite. The result was not significant, \( t(698) = 1.23, p = .22 \), suggesting that the interaction of ASI and talk title do not significantly predict scores on the Talk Interest Composite. I then conducted a multiple regression of both GNS and talk title on the talk interest composite. Again, the result was not significant, \( t(685) = .36, p = .72 \). Then, I conducted the same multiple regression analyses on the Speaker Competence Composite, again using GNS and ASI scores as the predictors. Neither analysis was significant: GNS, \( t(685) = 1.37, p = .17 \); ASI, \( t(698) = .28, p = .78 \).

**Study 3 Discussion**

This study suggests that audience members do reward women who talk about communal topics and denigrate them when they talk about agentic ones. Specifically, these findings show that individuals who rate speakers have the potential to disparately put men forward who talk about agentic topics over women who talk about agentic topics. Further, these individuals reward women significantly more who speak about communal topics—or topics in line with their gender role. Further, consistent with previous findings, women do this as much as men do, and for both genders, this is not necessarily an intentional or conscious process. While the results did not additionally show the predicted main effect, they do suggest that the interactions are in line with
gender stereotypes. Additionally, as suspected, prejudice (as measured by both the ASI and GNS) predicted participant scores in terms of the Talk Interest Composite. Thus, it seems that individuals who score higher on the ASI and GNS, subsequently rate potential speakers lower in terms of the Talk Interest Composite.

Further, the act of including one gender over the other in positions of visibility (e.g., agentic talks) may not, at first glance, seem to be that problematic. However, this action, compounded across women, has the potential to have very stark consequences for women. Consistent with the Social Role Theory (Eagly, 1987), if women are less visible, they may be perceived to have less success and they may actually get to practice their skills less frequently, both of which can result in a self-fulfilling prophecy of women being less successful at giving talks. Further, early career professionals, or young women, may gain exposure to fewer women in positions of status and power at a formative time in their educations (Martin, 2014). What arises from this is a string of potential consequences—women may not be chosen for jobs, they may not be evaluated well by students and colleagues, and they may have decreased self-efficacy for presenting or speaking about their research in public. Given these results, this may specifically be true for women who talk about agentic topics, or possibly even in more agentically-perceived content areas.

In this study, speaker gender arguably acted as a trigger for participants’ implicit prejudice. This can potentially explain the significant effect of speaker gender on the participants’ interest in the talk (as indicated by the Talk Interest Composite) as well as the participants’ perceived competence of the speaker (as indicated by the Speaker Competence Composite). Further, this provides evidence for the Lack-of-Fit model and Social Role Theory and demonstrates the stereotypes associated with gender roles at work. This research provides
data confirming that women continue to face barriers and marginalization in academia when they speak about agentic topics, and that women may still experience a variety of incivilities.

In the next study, we will replicate the current study’s methods among a sample of faculty members in the six departments we specified in Study 1 (bioengineering, biology, political science, psychology, sociology, and history), to see if the findings observed in Study 3 hold among a population of faculty members.

**Study 4**

**Participants**

We e-mailed 1,322 faculty members that we had identified from Study 1 (different faculty members from those contacted for Study 2), and asked them to take our survey instrument (included in the Appendix). We additionally collected the speakers from the next top 25 universities in the country (to top 75 in total) to broaden our list of potential participants. A total of 150 participants, 88 (59%) of whom were male and 62 (41%) of whom were female participated in this study. This was an 11% response rate from those individuals e-mailed.

**Methods**

This study is an electronic survey advertising a local university talk to faculty members. When advertising this talk, the gender of the speaker (male, female) is manipulated, as is the type of talk given (communal, agentic) and three content areas the talk is given in (history, psychology, and bioengineering). We only used three out of the six possible departments to reduce the complexity of the design. An example of the content of this type of advertisement is: “The Bioengineering Department would like to present: It’s All about Cooperation: Computer Wearable Designs that Improve Communication in Medical Treatments, a colloquium given by: Dr. Christina Smith, Associate Professor of Bioengineering, University of Illinois, May 22nd,
2014, Time: TBA.” The manipulation of gender is as parallel as possible: Dr. Christopher Smith versus Dr. Christina Smith. The manipulation of the talk title is as parallel as possible: all talks start with the phrase “It’s All about Cooperation” (communal condition) or alternatively “It’s All about Control” (agentic condition). Finally, the exact same procedure is followed across each department and condition. There are four conditions for every content area: Content Area-Female-Communal, Content Area-Female-Control, Content Area-Male-Agentic, and Content Area-Male-Control. This results in 12 different conditions (four for each of the three programs).

Measures

The same measures from Study 3 will also be used in this study, except a few additional items are also added into New Talk Interest and New Speaker Competence dependent variable composites—for additional thoroughness and comparison purposes.

Talk Interest. Participants also answer a number of questions regarding their feelings about hearing the talk and their impression of the speaker. Regarding the Talk Interest dependent variable composite, participants are asked to rate how they would feel about hearing the talk (Likert Scale, 1-Strongly Disagree, 4 – Neither Disagree nor Agree, 7-Strongly Agree) across 7 items: (a) “I would like to go to this talk,” (b) “This talk would be really interesting to me,” (c) “Most people would probably find this talk interesting,” (d) “I would volunteer to make this talk happen,” (e) “I would really dislike going to this talk” (reverse-coded), (f) “I would probably be bored at this talk” (reverse-coded),” (g) “I feel this talk would be a waste of my time” (reverse-coded). This composite had a Cronbach’s Alpha of .91.

New Talk Interest. This Composite includes all the items from the Talk Interest Composite, and additionally: (h) “This would be a very good talk to have at my university,” (i) “Most people would benefit from hearing this talk,” (j) “This talk would be well-attended,” (k)
“This talk would bring prestige to my university,” (l) “The research the speaker is talking about is of interest to me,” (m) “I think other individuals in my department would also find the research in this talk interesting.” (n) “It would be possible for a speaker to communicate why the topic of this talk was important,” and (p) “Many people in my department would be interested in attending a talk on this topic.” This new total composite, with both old and new items, had a Cronbach’s Alpha of .92.

**Speaker Competence.** Second, participants are asked to rate how they would feel about the speaker (Likert Scale, 1-Strongly Disagree, 4-Neither Disagree nor Agree, 7-Strongly Agree) across 10 items: (a) “The speaker is excellent,” (b) “The speaker is smart,” (c) “The speaker is prestigious,” (d) “The speaker is well-trained,” (e) “The speaker would give a great talk,” (f) “The speaker would be interesting,” (g) “The speaker would be boring” (reverse-coded), (h) “The speaker would be kind,” (i) “The speaker would be competent,” (j) “The speaker would have important things to say.” This composite had a Cronbach’s Alpha of .88.

**New Speaker Competence.** This Composite includes all the items from the Speaker Competence Composite, and additionally: (k) “This speaker would be commanding, and (l) “This speaker would be likeable.” This new total composite, with both old and new items, had a Cronbach’s Alpha of .89.

**Ambivalent Sexism Scale.** Third, participants are given the Ambivalent Sexism Scale (Glick & Fiske, 1996), which measures participants’ ambivalent sexism (defined as, simultaneously holding two sets of related sexist beliefs: hostile and benevolent sexism) in a 22-item questionnaire which includes two scores, one for hostile and one for benevolent sexism (Glick & Fiske, 1996). A sample question includes: “Most women interpret innocent remarks or acts as being sexist” (Likert scale, 1-Strongly Disagree to 7-Strongly Agree).
Gender Norm Attitudes Scale. Fourth, participants take the Gender Norm Attitudes Scale measures participants’ egalitarian beliefs about male and female gender norms (and measures prejudice) (Waszak, Severy, Kafafi, & Badawi, 2000). A sample question includes: “It is important that sons have more education than daughters” (Likert scale, 1-Strongly Disagree to 7-Strongly Agree).

Finally, participants completed manipulation checks to ensure they remembered the gender of the speaker, the talk title, and the type of event advertised. We also asked participants for their (a) gender, (b) ethnicity, (c) age, and (d) job title. The complete survey for one of the conditions is included in Appendix A.

Results

In terms of Hypothesis 1a, that faculty will rate men more favorably than women as speakers, I first conducted a $2 \times 2 \times 3$ factorial ANOVA on the Talk Interest Composite, using gender (male/female), talk title (agentic/communal), and department (history/psychology/bioengineering) as the independent variables. There was only a significant main effect of Department ($F(2, 141) = 4.05, MSE = 1.5, p = .019, \eta^2_p = .054$). As shown in Figure 7, talks given in the psychology department were rated as the most interesting, followed by the bioengineering department, followed by the history department (Psychology, $M = 4.04, SE = .16$; Bioengineering, $M = 3.93, SE = .23$; History, $M = 3.42, SE = .16$). No other effects were significant. Then, I ran a $2 \times 2 \times 3$ factorial ANOVA on the Speaker Competence Composite, again using gender, talk title, and department as the independent variables. This also revealed no significant effects.

When conducting the same analyses, but with the new composites for both dependent variables (New Talk Interest Composite and New Speaker Competence Composite), including
the new items only added in this study, there was again only a significant main effect of Department for the talk interest composite, $F(2, 141) = 3.47, MSE = 1.3, p = .034, \eta^2 = .047$. There were still no significant effects for the New Talk Interest or New Speaker Competence Composites. When conducting a 2 x 2 x 2 factorial ANOVA on both the original Talk Interest and Speaker Competence Composites, with Speaker Gender, Talk Title, and Participant Gender as the independent variables, there were no significant effects of participant gender.

Regarding Hypothesis 2, that participants who are higher on prejudice toward women will generally prefer male speakers than will those low on prejudice toward women, I conducted a simple linear regression analysis on the talk interest composite using the ASI as the predictor. The results were not significant, thus the Talk Interest Composite was not predicted by participants’ ASI scores, $t(152) = 0.14, p = .80$. Then, I conducted the same analysis using GNS as the predictor. The results were not significant, $t(152) = 1.67, p = .10$. Then, I conducted the same analyses on the other composite regarding Speaker Competence. Regarding GNS, the results were marginally significant, $t(152) = 3.12, \beta = -.15, p = .079, R^2 = .02$, suggesting that a marginally significant proportion of the speaker competence composite was predicted by participants’ scores on the GNS—as demonstrated in Figure 8. The 95% confidence interval was (-.32, .02). Regarding ASI, the results were not significant, $t(152) = 1.24, p = .22$.

Finally, Hypothesis 3, that the relation between participant prejudice and exhibited discrimination will be moderated by the talk title, I conducted a multiple regression of both ASI and talk title on the Talk Interest Composite. The result was not significant, $t(152) = 1.3, p = .19$. Then I conducted a multiple regression of both GNS and talk title on the Talk Interest Composite; this result was also not significant, $t(152) = .98, p = .33$. Finally, I conducted the same analyses on the Speaker Competence Composite. Regarding the ASI, there was a
significant talk title by ASI interaction, \( t(152) = 2.52, \beta = .27, p = .013, R^2 = .05 \), as demonstrated in Figure 9. The 95% confidence interval was (.06, .47). The talk title by GNS interaction was not significant: GNS, \( t(152) = 1.5, p = .62 \).

**Study 4 Discussion**

Similar to Study 3, we found no Gender main effect (Hypothesis 1a), although we did find a Department main effect on the Talk Interest Composite. There was no indicated preference by participants for women or men as speakers. Further, there was no significant Participant Gender main effect, so men and women were just as likely to neutrally favor men and women. Contrary to Study 3, we found no gender by talk title interaction (Hypothesis 1b) among this sample. Regarding Hypothesis 2, participants’ GNS scores were marginally significant at predicting speaker competence scores. Again, participants’ with higher GNS scores tended to rate speakers as less competent than those with lower GNS scores. Regarding Hypothesis 3, interestingly, there was a significant interaction between talk title and participants’ ASI scores on the Speaker Competence Composite. Thus, it appears that the speaker’s talk title does moderate the relationship between participant prejudice (as measured by the ASI) and perceptions of the speaker’s competence. It is interesting that an arguably more subtle measure of participants’ sexism seemed to interact so strongly with the talk title, but only regarding the Speaker Competence Composite (and not the Talk Interest Composite). Perhaps, because this dependent variable (Speaker Competence Composite) was more focused on the speaker, and less on the talk, this provided a more fruitful avenue for tapping more implicit participant bias towards the speaker. Specifically, individuals who were low on the ASI scale, generally rated talks higher than those high on the ASI scale, but individuals low on ASI also rated communal talks higher in
terms of speaker competence than did individuals high on the ASI scale, as demonstrated in Figure 9.

In summary, faculty appear to favor neither female nor male speakers. Generally, faculty seem to rate talks about psychology the highest in terms of the Talk Interest Composite, bioengineering the second highest, and history last. Yet, it is still intriguing that the results from Study 3 were not replicated among this sample. Perhaps the measures of prejudice more accurately measured participants’ attitudes than direct measures related to the stimuli. These results certainly further warrant investigation into procedures used by departments at the top universities to select colloquia speakers. The more ambiguous findings from Study 4, when coupled with the findings from Study 2 (regarding there being no gender differences in the importance of attending invited talks by men and women and there also being no gender differences in the number of talks declined), warrant investigation into the colloquia speaker selection procedures within the top universities. Consideration needs to be given to exactly what the procedures are at these schools for choosing faculty members to give invited talks. Or, in essence, the procedures under which the gatekeepers in each department at each school are operating.

**Study 5**

**Department Colloquia Procedures**

This study takes a preliminary look at whether the type of committee (i.e., individual versus group) and gender makeup (e.g., percentage of women) influence the extent to which women are brought in as colloquium speakers. In order to get a better sense as to how departments in our sample go about deciding which speakers to invite, we collected e-mail addresses for administrators in all the departments at all the schools in our sample.
Participants. We e-mailed 442 administrators that we identified by revisiting the department websites for the top 75 schools, and collecting the names of each department’s administrator(s), and their respective e-mail addresses, phone numbers, department affiliations, and universities. We received a total of 102 administrator responses. This was a 24% response rate.

Methods. We asked administrators four questions: (1) If your department’s colloquia speaker selection process is handled by an individual, what is his/her gender (Male/Female), (2) If your department’s colloquia speaker selection process is handled by a committee, please specify how many men and women are on the committee, (3) What is the name of your university, and (4) What department are you affiliated with. After we collected the data from these four questions, we went back to the list of our initial schools, and added the number of male and female speakers to each administrator’s department, as well as the percentage of women in each department represented.

Results. To begin this analysis, we first made a composite variable, called Percentage Female Speakers, which we calculated by simply taking the number of female speakers invited and dividing by the total number of speakers. We then used this as the outcome variable and examined potential characteristics that might predict what could lead to higher Percentage Female Speakers.

First, we examined whether those choosing colloquia speakers were individual colloquia chairs or whether a group of people served on a committee. Of the 102 participants who responded to our survey, 37 indicated that their colloquia speaker selection process was handled by an individual (36%), and 65 indicated that this process was handled by a committee (64%).
Then, we regressed the individual/committee variable onto the Percentage Female Speakers, which revealed no significant difference, \( t(43) = .34, p = .74 \).

Second, we examined the 37 individuals who served as colloquia chairs. Out of individuals who were selecting colloquia speakers, more men \((N_{men} = 25)\) than women \((N_{women} = 12)\) served as chairs. However, we were most interested in examining whether the gender of these individuals significantly predicted the Percentage Female Speaker, which it did, \( t(11) = 3.41, p = .027 \). That is, of the relatively small number of individuals who did respond to our survey \((N = 37)\), female colloquia chairs selected women as speakers 59% of the time whereas male colloquia chairs selected them 23% of the time.

Third, we examined the 65 groups comprising colloquia committees, which consisted of 154 men and 164 women. To examine whether the percentage of women on a committee influenced the Percentage Female Speaker we conducted a regression, which yielded significant results, \( t(30) = 2.19, \beta = .80, p = .037 \). The 95% confidence interval was \((.05, 1.56)\). That is, committees that had more representation of women on them were also more likely to choose a higher percentage of female colloquia speakers.

**Study 5 Discussion.** Thus, individuals are actually making the invitation decisions less frequently than committees are. Among the individuals making invitation decisions, men are represented twice as frequently as women. However, men and women are equally as likely to be on the committees making these decisions. Further, when tested, it appears that there is a positive relationship between the gender of the individuals making these decisions and the percentage of female speakers represented in each department. Additionally, when tested, it appears that there is also a positive relationship between the percentage of women on the committees and the percentage of female speakers represented in each department. Consequently, individuals and
groups are responsible for making the decisions regarding who to invite, and it appears that the
dearth in female speakers from the 2013-2014 academic year was positively related to both the
gender of the individuals as well as the percentage of women serving on the committees.

General Discussion

Study 1 demonstrated that there is a gender difference between men and women who give
talks at the top 50 universities in the United States based on the 2013-2014 academic year.
Across 50:50 ratios, ratios based on the PhD graduation rates in each department, ratios based on
the distribution of faculty members in each department, and finally ratios based on our own
sample’s base rates, men are by-and-large giving significantly more talks than women.

Study 2 sought to ameliorate any obvious arguments that attempted to explain this
phenomenon. The data in this study show that there are no differences in the frequency with
which women decline invited talk invitations as compared to men, and also that there are no
gender differences in ratings regarding the importance of attending invited talks. Giving invited
colloquia talks is just as important to male faculty members as it is to females, and men and
women decline invitations with equal frequency.

Understanding why the phenomenon described in Study 1 is occurring, was the aim of
Study 3. Specifically, we found that among 686 community members, men and women were
equally as likely to reward women who spoke about relationships (or gender-congruent topics)
and denigrate women who spoke about control (or gender-incongruent topics) based on
participant ratings of talk interest. Also, prejudice (as measured by the Gender Norm Attitudes
scale) predicted participant ratings of talk interest.

Yet, the argument could be made that this was a convenience sample, and we really
should discern if the same phenomenon would hold with a faculty sample. So, in Study 4 we
replicated the procedure from Study 3. In Study 4, we found a main effect of Department on the talk interest composite—and no significant effects of Gender. Further, there were no significant effects of participant gender, so men and women were just as egalitarian as each other. Additionally, there was a significant interaction between participants’ prejudice (as measured by the Ambivalent Sexism Inventory) and the speaker’s talk title on the speaker competence dependent variable. Thus, it appears that talk title does moderate the relationship between participant prejudice and participant ratings of speaker competence. Finally, there was also a marginally significant effect of participant prejudice (as measured by the Gender Norm Attitudes scale) on speaker competence ratings.

After considering Studies 1-4, we decided that attention needed to be given to the actual colloquium speaker selection procedures at each of the universities examined in Study 1. We know that there are a disproportionate number of male versus female speakers giving colloquium talks at the top 50 schools in the U.S. Study 3 demonstrates that people really are denigrating women who talk about gender-incongruent topics and rewarding women who talk about gender-congruent topics. Further, prejudice seems to be the mechanism for this behavior.

But in Study 4, results are inconclusive: there are no gender effects, just a main effect of department. Further, it appears that there is a relationship between prejudice (GNS) and ratings of speaker competence, and that prejudice (as measured by the ASI) has a significant relationship with talk title, such that talk title moderates the relationship with speaker competence ratings. So, this hints that there may be veiled prejudice that exists among our faculty sample with regard to speaker-specific characteristics. If this interpretation really is the explanation for what is occurring with our faculty sample, and the community sample really was more forthcoming, then we needed to examine the arena in which the bias exists: among the committees and individuals
who are tasked with making talk invitations to speakers. It may be that the individuals or groups who are inviting speakers are susceptible to bias at the individual level, and thus are not making decisions that are representative of the faculty at-large. So what is happening in the interplay between faculty who are being invited to give talks and the procedures that govern how these invitations are made?

Here, our research shows, based on reports from 102 departmental representatives, that individuals are making these decisions less-frequently than committees. Further, when individuals are making these decisions, they are twice as likely to be male as female. However, it appears that even numbers of men and women are making these decisions when serving on committees. Additionally, the results indicated that the gender of individuals significantly predicted the percentage of female speakers, and that the percentage of women on the committees also predicted the percentage of female speakers. Thus, these results indicate that there is something at the individual and committee level that is especially susceptible to the biases that are resulting in the disproportionate number of male colloquia speakers to female speakers. And, contrary to previous research, the results suggest that this does have something to do with the gender of the individuals serving in these roles. So, what is to be done?

**Strategies to Ameliorate Bias**

Previous research finds that both men and women select men over women for leadership positions, even when credentials are identical or despite portraying the female candidate as slightly more effective (Carnes & Bland, 2007). Yet, the research we present from Study 5, clearly shows that the more women who serve in gatekeeping roles results in more women being invited as speakers. Thus, how can a bias that stems from a lack of women serving in gatekeeping roles be ameliorated? First, researchers suggest that individuals who select PIs
establish a priori criteria regarding the desired qualities for PIs, and that at least 35% of the people who establish these criteria be women. Second, they suggest that these criteria be explicit and include the full range of skills that they would like to see in those PIs selected. Third, and most generalizable, the research suggests that people who serve in these roles (that we would call “gatekeepers”) are made aware of the unconscious gender stereotypes and their negative impact on women’s career advancement. These three recommendations can easily be translated and applied to those individuals and groups who invite speakers to give colloquia talks. Objectively listing criteria for those considered for invitations, specifying a general preference for gender neutrality, and making gender stereotypes salient seem to be several simple ways to control the biases inherent in many gatekeeping processes.

This research sheds light on a phenomenon that addresses implicit, difficult-to-observe discrimination that may be occurring at unconscious levels by academic gatekeepers at large. Differential selection by gender has been observed in hiring (Bavishi, Madera, and Hebl, 2010; Elg & Jannergård, 2003) and when reviewing CVs (Steinpreis et al. 1999; Madera, Hebl, & Martin, 2009), so it follows that there would be gender differences in academic speakers at various universities, as well—since this is another context where gatekeepers play a large role. Speaker gender may arguably be acting as a trigger for participants’ implicit prejudice.

Limitations

Several limitations are inherent in these studies. First, our faculty and administrator sample sizes are limited by the responses we received to requests for participation. If faculty and administrators did not want to participate, we did not have much latitude to offer incentives—participation was based on generosity and good will, which is why our response rates hovered
between 10-20%. Further, we had less than one-fourth of the number of participants from Study 2 in Study 4—this certainly could be improved in future research.

Second, we did limit analyses to participants from the top 50, and then in Study 4 the top 75, universities in the country. We did this in an attempt to control for university prestige, but it is possible that speakers solicited by the top universities in the country were not of equal stature, and perhaps there was more variability in these top speakers than merely picking the top universities addressed.

Third, there may be some other third variable that we have not considered that may address the source of the biases that we identified in Studies 1 and 3. Yet, we did attempt to rule out all likely possibilities of this in Studies 2 and 5. However, the incongruence between the results from our faculty and community samples certainly leads to the conclusion that there is additional work to be done.

**Future Research**

Gender balancing strategies, like those included here, can reduce exclusion by increasing female representation in departments and among speakers. Yet, even when gender composition in departments and among speakers is controlled, women still perceive greater exclusion than men, due to the sheer tenacity of gender norms and relationships (Maranto & Griffin, 2010). Thus, reducing any potential backlash to enacting policies to increase female representation may be positively impacted by procedural fairness and general gender equity in departmental decision-making.

Further, future research should certainly examine additional strategies to mitigate unconscious bias among all groups that could be classified as gatekeepers. This could include human resource personnel in companies, individuals who make promotion decisions, individuals
and committees who award promotions and tenure in academia, individuals and committees who solicit job applicants, and likely a myriad of other cases where supplementary decisions are being made that impact individuals’ careers—but are not always the focus of selection and recruitment research.

Also, women face a very real quandary: if they fail to soften their female agency, and explicitly counteract it by presenting an image that is both nice and able, they really do face backlash (Rudman & Glick, 2001). This can manifest as being passed over for promotion and tenure opportunities, and included among these, could be invitations to speak at academic colloquia.

**Conclusions**

In conclusion, speakers who come to campuses gain visibility; their visits may be precursors to collaborations and to job offers. Further, evidence suggests that outside job offers are keys to advancements and promotions. Given this, the people who serve as colloquia inviters or committees are gatekeepers: they are people who may be unconsciously promoting some individuals (in this case, women) over others (in this case, men). Our research shows that when we use a very liberal test (50%) to examine whether gender differences exist among those invited to give colloquia talks, significant differences emerged in five of six areas. Using a less liberal estimate, based on the published number of PhD graduates in each department, significant differences emerged in all six areas. Using an even more conservative estimate, based on the published number of faculty in each department from 2012, significant differences emerged in three out of the six areas. When using the base rates in our sample, significant differences emerged in two out of six areas. And finally, when looking across faculty ranks in each department, significant differences emerged in twelve out of eighteen comparisons.
Still, critics might point to the fact that women are declining offers more than men—yet, our research did not support this. Critics might also suggest than women may not think giving invited talks is as important as men—our follow-up research did not show this, either.

What additional research did yield was that such decisions are sometimes made by individuals and sometimes made by groups. Also, these individuals are more likely to be men than women, but the groups are equally likely to consist of women as men. Finally, the gender of these women and men did significantly predict the gender of the speakers at their departments’ colloquia, such that having a female individual or women in the group, significantly predicted the percentage of female speakers at departmental colloquia. Hence, we conclude that gatekeepers may consist of either individuals or groups, may be men or women, and that if we want to have equitable opportunities for academic women, we need to make the current biases salient and promote strategies to manage these biases when making invitations to colloquia speakers.
References


Maranto, C. L. & Griffin, A. E. (2010). The Antecedents of a ‘Chilly Climate’ for Women Faculty in Higher Education. *Human Relations, 64*(139), 139-159.


Rice University. (2013). Internal report of PhD and faculty gender distribution.


Table 1

*Twenty-four, gender-based comparisons across six programs in academia*

<table>
<thead>
<tr>
<th>Program</th>
<th>50%</th>
<th>Female PhD’s</th>
<th>Female Faculty</th>
<th>Base Rates</th>
<th>Actual</th>
</tr>
</thead>
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<tr>
<td>Bioengineering</td>
<td>*--</td>
<td>*38%</td>
<td>*40%</td>
<td>*33%</td>
<td>23%</td>
</tr>
<tr>
<td>Biology</td>
<td>*--</td>
<td>*47%</td>
<td>32%</td>
<td>*33%</td>
<td>29%</td>
</tr>
<tr>
<td>Political Science</td>
<td>*--</td>
<td>*40%</td>
<td>*19%</td>
<td>33%</td>
<td>30%</td>
</tr>
<tr>
<td>Psychology</td>
<td>*--</td>
<td>*67%</td>
<td>36%</td>
<td>*33%</td>
<td>38%</td>
</tr>
<tr>
<td>Sociology</td>
<td>--</td>
<td>*61%</td>
<td>*58%</td>
<td>*33%</td>
<td>45%</td>
</tr>
<tr>
<td>History</td>
<td>*--</td>
<td>*45%</td>
<td>36%</td>
<td>*33%</td>
<td>39%</td>
</tr>
</tbody>
</table>
Table 2

_Eighteen, gender-based comparisons across three faculty ranks an six programs in academia_

<table>
<thead>
<tr>
<th></th>
<th>Bio-engineering</th>
<th>Biology</th>
<th>Political Science</th>
<th>Psychology</th>
<th>Sociology</th>
<th>History</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assistant</strong></td>
<td>Male</td>
<td>*76%</td>
<td>*64%</td>
<td>*64%</td>
<td>58%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>*24%</td>
<td>*36%</td>
<td>*36%</td>
<td>42%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Associate</strong></td>
<td>Male</td>
<td>*76%</td>
<td>*70%</td>
<td>*63%</td>
<td>57%</td>
<td>49%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>*24%</td>
<td>*30%</td>
<td>*37%</td>
<td>43%</td>
<td>51%</td>
</tr>
<tr>
<td><strong>Full</strong></td>
<td>Male</td>
<td>*84%</td>
<td>*79%</td>
<td>*75%</td>
<td>*69%</td>
<td>*62%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>*16%</td>
<td>*21%</td>
<td>*25%</td>
<td>*31%</td>
<td>*38%</td>
</tr>
</tbody>
</table>
Figure 1. Study 1: Representation of Male and Female Speakers by Department across the Top Fifty Universities in the U.S.
Figure 2. Study 3: Gender by Talk Title Interaction on Talk Interest
Figure 3. Study 3: Main Effect of Talk Title on Talk Interest
Figure 4. Study 3: Gender by Talk Title Interaction on Speaker Competence
Figure 5. Study 3: Hypothesis 2, Gender Norms Scores Regressed on Talk Interest Composite
Figure 6. Study 3: Hypothesis 3, Ambivalent Sexism Scores Regressed on Talk Interest Composite
Figure 7. Study 4: Main Effect of Department on Talk Interest
Figure 8. Study 4: Hypothesis 2, Gender Norms Scores Regressed on Speaker Competence Composite
Figure 9. Study 4: Hypothesis 3, Ambivalent Sexism Scores and Talk Title regressed on Speaker Competence Composite
Appendix A

Sample Survey for Studies 3 and 4

University Talk

The Bioengineering Department would like to present:

It’s All about Cooperation: Computer Wearable Designs that Improve Communication in Medical Treatments

a colloquium given by:

Dr. Christina Smith
Associate Professor of Bioengineering
University of Illinois

May 2, 2014
Time: To be determined
**2. Please rate how you would feel about hearing the talk.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Disagree nor Agree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would like to go to this talk.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This talk would be really interesting to me.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Most people would probably find this talk interesting.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I would volunteer to help make this talk happen.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I would really dislike going to this talk.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I would probably be bored at this talk.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I feel this talk would be a waste of my time.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This would be a very good talk to have at the local university.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Most people would benefit from hearing this talk.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This talk would be well-attended.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This talk would bring prestige to the local university.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**3. Please indicate how you feel about the speaker.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Disagree nor Agree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>This speaker is excellent.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This speaker is smart.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>This speaker is prestigious.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This speaker is well-trained.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
</tr>
<tr>
<td>This speaker would give a great talk.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This speaker would be interesting.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This speaker would be boring.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
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<tr>
<td>This speaker would be kind.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
</tr>
<tr>
<td>This speaker would be competent.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This speaker would have important things to say.</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
4. Please indicate if you agree or disagree with the following statements:

<table>
<thead>
<tr>
<th>It is important that sons have more education than daughters.</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Disagree nor Agree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daughters should be sent to school only if they are not needed to help at home.</td>
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<tr>
<td>The most important reason that sons should be more educated than daughters is so that they can better look after their parents when they are older.</td>
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<tr>
<td>If there is a limited amount of money to pay for tutoring, it should be spent on sons first.</td>
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<tr>
<td>A woman should take good care of her own children and not worry about other people’s affairs.</td>
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</tr>
<tr>
<td>Women should leave politics to the men.</td>
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<tr>
<td>A woman has to have a husband or sons or some other male kinsman to protect her.</td>
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</tr>
<tr>
<td>The only thing a woman can really rely on in her old age is her sons.</td>
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<td></td>
</tr>
</tbody>
</table>
* 5. What was the gender of the speaker?
   - Male
   - Female
   - Can’t Remember

* 6. What was the talk about?
   - Control
   - Relationships
   - I can’t remember

* 7. We would now like to assess your memory for the event advertisement that you saw.

   Did you evaluate the following:
   - A talk by the university president
   - An art exhibit
   - A student protest
   - A talk by a professor
   - A talk by a student
   - A basketball game