

Report on a research study:

Women's visibility in academic seminars:

Women ask fewer questions than men

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A. PURPOSE OF THE REPORT

This research study finds that women ask absolutely and proportionally fewer questions than men at departmental academic seminars. This is a problem because when women don't speak up, they aren't visible as role models to women at earlier career stages, which has been shown to contribute to the leaky pipeline in STEM subjects. We found that this gender imbalance in question-asking is reduced when a woman asks the first question. We provide recommendations for creating an environment that makes everyone feel more comfortable to ask questions; although the research focused on women, our recommendations are likely to benefit other underrepresented groups too (e.g., introverts).

The purpose of this report is to share the findings of the research study, and generate ideas on how to disseminate these findings, both across universities and more broadly, in the hopes of encouraging changes to question-asking environments of all kinds (at seminars, but also in the classroom, and in the workplace) to encourage diversity in the voices/ideas that are heard.

B. BACKGROUND AND AIMS OF THE PROJECT

a. Background

While attending an academic seminar (at another institution), my colleague Alecia noticed and commented to her colleague Dieter that all the questions were coming from men; Dieter pointed out that the audience seemed to be primarily women. Alecia and Dieter started keeping track of attendance and question-asking behaviour at various seminars at their institution for two years. Upon finding evidence of a gender imbalance in question-asking, they were motivated to figure out how widespread the phenomenon is, and why it is occurring. I was asked to join the team because of my expertise in studying human behaviour, and I also brought on Alyssa, whose research is specifically about gender stereotypes.

b. Data collection

- Sample 1: >600 academic respondents completed an online survey, self-reporting attendance and question-asking at seminars, their perceptions of others' question-asking behaviour in seminars, and their beliefs about why they themselves and others do and do not ask questions in seminars
- Sample 2: 42 observers collected naturalistic data at almost 250 seminars in 42 departments in 10 countries (including 2 departments at the University of Essex) to quantify the attendance and question-asking behaviour of women and men in departmental seminars

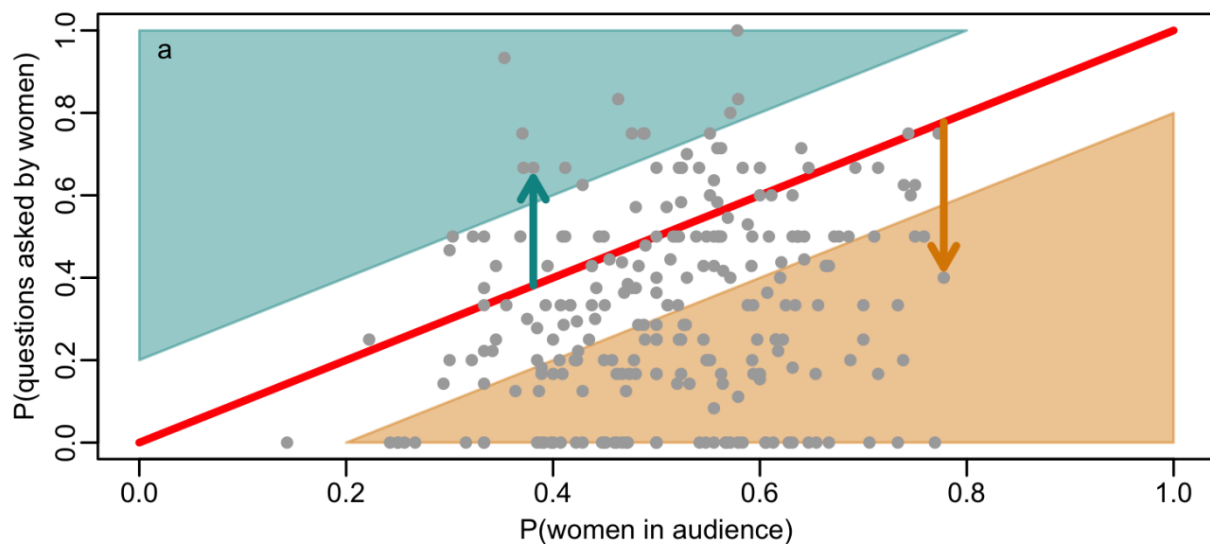
LITERATURE REVIEW

- There are gender differences in many areas of academia
 - Men are overrepresented in terms of authorship, especially first, senior, and sole authorship (Brown & Goh, 2016; Filardo, da Graca, Sass, Pollock, Smith, & Martinez, 2016; Jagsi et al., 2006; West, Jacquet, King, Correll & Bergstrom, 2013)
 - Men's papers are cited more often than women's (Brown & Goh, 2016; Maliniak, Powers & Walter, 2013)
 - Women are more likely than men to be credited with performing the experiments (i.e., the more physical part of the process), whereas men are more likely than women to be credited with data analysis, experimental design, contributing tools, and writing (i.e., the more conceptual parts of the process; Macaluso, Larivière, Sugimoto & Sugimoto, 2016)
 - Women are less likely than men, and less likely than expected given their proportional representation in a field, to give talks at conferences, and instead tend to contribute to less prestigious (and less visible) alternatives, such as posters (Isbell, Young & Harcourt, 2012; Johnson, Smith & Wang, 2017; Schroeder et al., 2013)
 - Women ask proportionally fewer questions than men at conferences (Davenport, Fouesneau, Grand, Hagen, Poppenhaeger & Watkins, 2014; Hinsley, Sutherland & Johnston, 2017; Pritchard et al., 2014)
- These gender differences matter
 - People tend to make inferences about which characteristics are needed to be successful in a given role by examining the characteristics of the people who most predominantly occupy that role (Eagly & Steffen, 1984)
 - Because women are often underrepresented in the later career stages of academic science, they might infer that (a) they do not possess (or want to express) the relevant characteristics for senior faculty positions, and (b) they do not belong in those particular careers
- There are implications for the classroom
 - Female undergraduate students are less likely to volunteer to answer an instructor's questions in class, and somewhat less likely to pose their own questions (Eddy, Brownell & Wenderoth, 2014)
 - During the early years of schooling, girls are slightly *more* likely than boys to raise their hands to ask a question but teachers are less likely to choose them to answer (Kelly, 1988)
- There are implications for the workplace (beyond the academy)
 - In decision-making tasks, women speak less than their proportional representation would predict (Karpowitz, Mendelberg, & Shaker, 2012)
 - Female American Senators talk less than would be expected given their seniority (Brescoll, 2011)
 - Male MPs in the Swedish Riksdag give more speeches (Bäck, Debus, & Müller, 2014)

C. FINDINGS

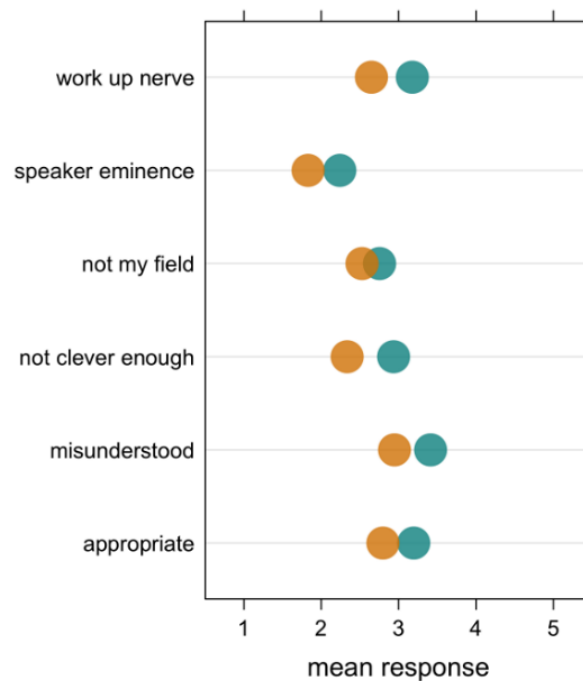
A preprint with our findings is available at <https://arxiv.org/abs/1711.10985> and a manuscript is currently under review for publication at PLoS One.

- a. Is there a gender difference in attendance at academic seminars?
 - i. no difference between men and women in self-reported frequency of attendance
 - ii. no difference between men and women in observed attendance
 - iii. fewer women than men were seminar speakers
- b. Is there a gender disparity in the question-asking of audience members in academic seminars?
 - i. Do academics perceive a gender disparity in question-asking?
 - Most respondents reported that gender played a role in who asked questions at seminars, but...
 - women reported more frequently than men that they believed there was a bias towards men asking more questions
 - The vast majority of respondents of both genders reported that they sometimes did not ask a question when they had one, but...
 - women self-reported asking questions less frequently than men
 - ii. Can a disparity be observed?
 1. Fewer women asked questions after seminars than would be expected given the proportion of women in the audience; men attendees were over two-and-a-half-times more likely to ask a question than women attendees



NOTE: Points falling in the lower (orange) half of the plot indicate a disparity towards men, whilst points falling in the upper (green) half indicate a disparity towards women audience members.

- c. Why is there a disparity in women's question-asking in academic seminars?
- i. Why do women and men not ask questions when they want to?
- women rated all 'internal' (i.e., personal) factors as more limiting than men



NOTE: Shown are the mean values for women (green) and men (orange) rating how important each factor is in restricting why they themselves did not ask questions when they wanted to

- ii. What observable factors are associated with the disparity?

Factor	Change in proportion of questions asked by women
Internal speaker (true vs. false)	9% ↑
Speaker gender (male vs. female)	8% ↑
Gender of person to ask first question (female vs. male)	6% ↑
Total # questions (Mdn = 6)	10 questions: 3.2% ↑ 15 questions: 7.6% ↑
% of female audience members	5% more women: ~1.6% ↑
% of female staff in department	5% more women: ~1.5% ↑

- d. How can we address the disparity?
- i. What do survey respondents think can be done to reduce the gender disparity?
 - most likely: having more confidence, having an opportunity to ask the question in person
 - least likely: having a moderator, having a better moderator that engages the audience
 - ii. What factors are associated with differences in self-reported question-asking?
 - women reported asking more questions when they were: interested in the subject, desired clarification, wanted to act as a model for more junior academics, or when there were fewer people attending the seminar
 - iii. What factors are associated with differences in observed question-asking?
 - In 2 departments, we asked speakers to shorten their talks by 5-10 min in an effort to increase the proportion of questions from women
 - o our manipulation was not successful; the duration of the time for questions was no longer in these departments. Probably because...
 - o across all observed seminars, we found no association between the length of the seminar and the length of the question time

D. LIMITATIONS

- i. One possible alternative interpretation: more senior audience members are more willing to ask questions after seminars, and the data could accurately reflect the gender discrepancy in the proportions of senior audience members
 - We did not collect data on the seniority of the attendees asking questions (because we did not expect our observers to be familiar with the seniority of all audience members). But...
 - We statistically controlled for the proportion of female faculty members in the host department and it didn't fully explain the variation in the proportion of questions asked by women
 - This may suggest that senior women asked proportionally fewer questions than their senior male counter-parts, which is what senior women self-reported doing and is in line with the larger problem we have documented here
 - Men self-reported asking questions after seminars at higher frequencies than women at every career stage (not just at the senior level)
 - consistent with one study of question-asking behaviour at conferences

E. (UNTESTED) RECOMMENDATIONS

- i. Call on a woman to ask the first question
 - We don't have any causal evidence that this will reduce the discrepancy, but it might set the tone for a more inclusive discussion
- ii. Train moderators/meeting chairs to:
 - Keep individual questions and answers shorter, to allow more questions in the same amount of time (which was associated with more questions by women)
 - Could also encourage audience members to ask shorter questions
 - Avoid biases (calling on senior people, people they know, people sitting at the front)
- iii. Provide a break between talk and questions
 - This gives people time to formulate questions and try them out on a neighbour to build confidence (a common teaching technique)
 - In meetings: circulate materials ahead of time so people can prepare their questions before the meeting

F. A NOTE OF CAUTION

My co-authors and I have tried to be careful not to point the finger at anyone. These results DO NOT suggest that men are the cause of women asking fewer questions; women attribute their lack of question-asking to various internal factors (though our observational data suggest that various contextual factors also play a role). We are not specifically advocating for men to simply ask fewer questions or for women to simply ask more questions. Instead, our goal is to highlight that there is gender imbalance in question-asking that is worth considering. We hope and expect that our recommendations will create a more positive environment that will benefit everyone, not just women, and allow everyone to feel more comfortable to ask a question if they have one.

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