



Author's gender affects rating of academic articles: Evidence from an incentivized, deception-free laboratory experiment



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ABSTRACT

Even though women's position in academia has changed dramatically over the last few decades, there is still some evidence that when it comes to evaluation of scientific achievements, gender may play a significant role. Gender bias is particularly likely to take the form of statistical discrimination. In this study we sought to verify the hypothesis that researcher's gender affects evaluation of his or her work, especially in a field where women only represent a minority. Towards this end we asked a sample of subjects, mostly economics majors, to evaluate a paper written by mixed-gender couples, indicating that it was (co-)authored by a "female economist", "male economist", "young female economist" or "young male economist" or giving no information about the author at all. While age factor played no role, female authors appeared to be seen as less competent than males, in that subjects (being incentivized to give their best judgment) less often believed that their papers have been published. This effect did not interact strongly with the gender of the subject.

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1. Introduction

Does gender still matter when we picture a successful scientist? A hundred years ago portraying a researcher as a male was quite natural, given that there were so few women in science. During the last few decades, the number of female researchers has increased dramatically, but gender imbalance remains strong at the higher levels of academia. Even though women now receive as many PhD diplomas as men, they hold only 19.4% and 7.9% of full-time professorships in social sciences and engineering and technology, respectively, in the European Union (*She Figures, 2012*).¹ Which of these two speeds of transition shapes the predominant view of women in academia? Could gender imbalance be partly blamed on biased evaluation based i.a. on the gender-science stereotype?

In this project we sought to answer these questions by letting our subjects (mostly master students) evaluate research papers in economics. We observed how their judgment was affected by identity (esp. gender) of the author, while actual quality of the paper was kept constant. We found some tendency to perceive female authors as inferior. In the next section we review some relevant literature. Next we describe the design of our experiment (emphasizing how it differs from extant literature) and spell out predictions. *Section 4* covers parametrical and non-parametrical tests of treatment effects and *Section 5* discusses some interpretations and implications of our findings.

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¹ Highest positions are strongly dominated by males also in other types of institutions, (*Klumpp and Su, 2013; Smith et al., 2013; Haveman and Beresford, 2012; Bjerk, 2008*).

2. Literature review

In a study that paved the way for much of literature on gender-science stereotype, [Mead and Metraux \(1957\)](#) asked US high school students to write an essay about a scientist. Vast majority of them described a man. Several studies using a Draw-A-Scientist Test (DAST) found similar results in individuals of different ages ([Chambers, 1983](#); [Fort and Varney, 1989](#); [Rosenthal, 1993](#); [Steinke et al., 2007](#)). Interestingly, younger children seem to be relatively more likely to draw a woman ([Barman, 1996](#); [Liu et al., 2010](#)). Generally, for more than half a century of research based on DAST, results have been stable – the stereotype was (and still is) strongly noticeable irrespective of the changes that have occurred in the scientific world.

The gender-science stereotype is not only an American phenomenon – in studies in the UK ([Maoldomhnaigh and Hunt, 1988](#)), Korea ([Song and Kim, 1999](#)), China ([Liu et al., 2010](#)) or Turkey ([Turkmen, 2008](#)), most children drew men. This view is also unrelated to being a child or a student – other adults also consider it much more likely that a scientist will be a man rather than a woman ([Losh, 2010](#)). Once a fact of life, it is now an obsolete stereotype that is possibly harmful to young women considering or pursuing a scientific career.

The gender-science stereotype is understandable when looked upon through the lens of social role theory ([Eagly, 1987](#)). It proposes that gender stereotypes are rooted in expectations about roles of men and women in the society. Females, due to their ‘natural’ roles as mothers, are expected to deal with repetitive tasks and taking care of others. Their fields of expertise include relations and emotions. By contrast, males’ responsibility in this context is to provide resources necessary for the family to survive. They are thus expected to develop assertiveness and creativity and become leaders. Working as a scientist requires characteristics such as ingenuity and self-reliance which tend to be associated with the male rather than female role.

Stereotypical perception may be modulated by target’s age. Young women will be considered more often as mothers (or mothers-to-be) of small children, who should be rather concerned about their family than professional career ([Sabelis and Schilling, 2013](#); [Niemištö et al., 2015](#); [Wilks and de Oliveira, 2014](#)).

In view of this, statistical discrimination is a likely possibility ([Arrow et al., 1973](#); [Phelps, 1972](#)). Indeed, given limited information about any particular female academic ability, observers are likely to rely on their stereotypical perception of typical women’s talents in this domain. As [Nosek et al. \(2009\)](#) point out, the “generally speaking, scientists are male” stereotype might be easily transformed to “generally speaking, good scientists are male” without any factual basis. Unconscious belief in correlation between gender and qualification (based on the incomplete or even averaged information) may influence evaluation of scientific achievements and impede development of female researchers. As [Albrecht et al. \(2013\)](#) observed, males are irrationally perceived to be more likely to do well in a masculine task than women that were actually *matched on performance*. Likewise, in a lab experiment conducted by [Reuben et al. \(2014\)](#), women were less likely to be hired to perform an arithmetic task, even if their past performance was revealed to equal that of men.

Identifying possible gender bias in judgment of academic work is particularly important in view of the fact that scientists are almost constantly being evaluated.² With submissions to journals and conferences, applications to graduate schools, and job interviews, even a trace of prejudice in the competitive world of academia might have a lasting impact on an individual’s future career. It must also be remembered that evaluators are mostly men (because of gender imbalance at higher positions). Thus possible in-group favouritism will have a particularly strong impact. However, science-gender bias could also make women perceive *themselves* as less capable of doing research. As a result they may be less willing to choose academic career, reduce their effort and in the end perform less well. Stereotype threat of that sort has been documented to i.a. affect women’s performance on difficult math tests ([Spencer et al., 1999](#)).

Empirical studies focusing on evaluations in academia sometimes do report gender bias. [Wenneras and Wold \(2001\)](#) found that female postdocs had to publish several more articles in top journals (and over a dozen in less known ones) to be judged as productive as similar male candidates during the recruitment process. Women receive also fewer grants and smaller funds for research compared with male scientists ([Bornmann et al., 2007](#)). Studies on journal publication history show that men are favoured as papers’ authors in several disciplines such as ecology ([Tregenza, 2002](#)), medicine ([Link, 1998](#)) and biomedicine ([Wenneras and Wold, 2001](#)). Men also win many more awards in STEM (Science, Technology, Engineering and Mathematics) disciplines than would be predicted by the proportion of nominees and their position in academia ([Lincoln et al., 2012](#)). On the other hand, [Canizares \(2009\)](#) pointed out that in the last 20 years at many American research-intensive universities, women have been more likely to be invited to job interviews and to receive a position than men. Likewise, [Budden et al. \(2008\)](#) indicated that even if introducing double-blind peer review (i.e. the identities of both the author and the reviewer are hidden) increased representation of female authors in biological sciences, reasons other than gender bias could explain the phenomenon ([Engqvist and Frommen, 2008](#)). See [Ceci and Williams \(2011\)](#) for a critical review of this research (concluding that there is no bias after all).

On top of the studies using pre-existing field data, experimental methods have sometimes been used to create circumstances in which “evaluated scientists” differ only by gender, potentially providing cleaner answers to questions concerning gender issues in science.

² This also makes them a group that may be particularly attractive for researchers interested in biases in evaluation. Of course, generalizations to other professions must always be done with caution.

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