

## Anonymous-Double Blind Review Process

### Annotated Bibliography/Excerpts

1. **Budden, A. E. *et al.* Double-blind review favours increased representation of female authors. *Trends Ecol. Evol. (Amst.)* 23, 4–6 (2008). doi:10.1016/j.tree.2007.07.008**

Abstract: Double-blind peer review, in which neither author nor reviewer identity are revealed, is rarely practised in ecology or evolution journals. However, in 2001, double-blind review was introduced by the journal *Behavioral Ecology*. Following this policy change, there was a significant increase in female first-authored papers, a pattern not observed in a very similar journal that provides reviewers with author information. No negative effects could be identified, suggesting that double-blind review should be considered by other journals.

Double-blind review is frequently criticized on the grounds that it involves an increased administrative load and that authors can be readily identified. However, the more compelling issue is whether double-blind review makes a difference. In light of our study, and evidence that the ecology and evolutionary biology community support double-blind review [12], now might be the time for journals to revisit this issue.

2. **Darling, E. S. Use of double-blind peer review to increase author diversity. *Conserv. Biol.* 29, 297–299 (2015). doi:10.1111/cobi.12333**

*Recommended: A brief research letter that discusses merits and limitations of double-blind review in increasing author diversity.*

3. **Guglielmi, Giorgia. Gender bias tilts success of grant applications: But it goes away when reviewers focus on the science. *Sci.* 554, 14-15 (2018). doi: 10.1038/d41586-018-01212-0**

Summarizes a study in which the same batch of proposals was sorted with a focus on the researcher's CV or by the science itself, with limited focus on the researcher. Male proposers had 4x the advantage in the CV cohort, where the gender and researcher was known. Summary of bioRxiv preprint paper (Witteman, 2018).

4. **Hill, S. & Provost, F. The myth of the double-blind review?: author identification using only citations. *ACM SIGKDD Explorations Newsletter* 5, 179 (2003). doi:10.1145/980972.981001**

*This paper is critical of the double-blind review process and its ability to guarantee anonymity in most cases, but it calculates how often author identity can be guessed based on published papers, not papers submitted for review.*

Prior studies have questioned the degree of anonymity of the double-blind review process for

scholarly research articles. For example, one study based on a survey of reviewers concluded that authors often could be identified by reviewers using a combination of the author's reference list and the referee's personal background knowledge. This paper describes the issues surrounding author identification, how these issues motivated our study, and the results we obtained. The best method, based on discriminative self-citations, identified authors correctly 40-45% of the time... Additionally, the top-10% most prolific authors can be identified 60% of the time.

- 5. Kretschmer, H. & Kretschmer, T. Gender bias and explanation models for the phenomenon of women's discriminations in research careers. *Scientometrics* 97, 25–36 (2013). doi:10.1007/s11192-013-1023-7**

Abstract: In the present paper four myths of gender differences in scientific performance are presented and discussed. The persistence of these myths in different forms of evaluation is influencing the women's discriminations in research careers in combination with effects explained in other explanation models for the existence of the unseen barrier (glass ceiling) that keeps women from rising to the upper levels ...

- 6. Le Goues, C. *et al.* Effectiveness of Anonymization in Double-Blind Review [arxiv preprint]. *Communications of the ACM* (2017). <https://arxiv.org/abs/1709.01609>**

Recommended

Abstract/Excerpts: Double-blind review relies on the authors' ability and willingness to effectively anonymize their submissions. We explore anonymization effectiveness at ASE 2016, OOPSLA 2016, and PLDI 2016 by asking reviewers if they can guess author identities. We find that 74%–90% of reviews contain no correct guess and that reviewers who self-identify as experts on a paper's topic are more likely to attempt to guess, but no more likely to guess correctly. We present our findings, summarize the PC chairs' comments about administering double-blind review, discuss the advantages and disadvantages of revealing author identities part of the way through the process, and conclude by advocating for the continued use of double-blind review... The PC chairs of all three conferences strongly support the continued use of double-blind review, find it effective at mitigating (both conscious and subconscious) bias in reviewing, and judge the extra administrative burden to be relatively minor and well-worth the benefits... Having a dedicated organizational position to support double-blind review can also help.

- 7. Lee, M., Om, K. & Koh, J. Blind review of research proposals in Korea: Its effectiveness and factors affecting applicant detection. *Scientometrics* 45, 17–31 (1999). doi:10.1007/BF02458466**

Recommended. One of the few studies that addresses blind review in the proposal process. Attempts to study double-blind review empirically using national level research in Korea. Article assesses the effectiveness of double-blind review (referred to only as "blind review") and anonymity it is purported to provide and finds that reviewers correctly guess author identity in ~36% of cases, and wrongly predict in ~34%. Researchers found that reviewers favored

*double-blind model.*

8. Lee, M., Om, K. & Koh, J. The Bias of Sighted Reviewers in Research Proposal Evaluation: A Comparative Analysis of Blind and Open Review in Korea. *Scientometrics* 48, 99–116 (2000). doi:10.1023/A:1005636503358

*Recommended.* Addresses bias in peer-review of research proposals and whether double-blind reviewing can eliminate or lessen biases against proposers. Looks at biases related to stage of research, perceived innovation/originality, mainstream vs. non-mainstream research topics.

9. Marsh, H. W., Jayasinghe, U. W. & Bond, N. W. Improving the peer-review process for grant applications: reliability, validity, bias, and generalizability. *Am Psychol* 63, 160–168 (2008). doi:10.1037/0003-066X.63.3.160

*Recommended.* Does not address whether to assess grant applications in single-blind or double-blind environment, but does recommend other strategies for controlling reviewer biases based on authors' gender, age, career-level/rank, affiliation, etc.

10. Mulligan, A., Hall, L. & Raphael, E. Peer review in a changing world: An international study measuring the attitudes of researchers. *Journal of the American Society for Information Science and Technology* 64, 132–161 (2013). doi:10.1002/asi.22798

*Recommended.* One of the more comprehensive and accessible studies on the history of peer review in general. The paper addresses pros and cons of single-blind, double-blind, and open peer review models and potential alternatives to the traditional peer review system using comments from researchers across scientific fields. While this paper discusses peer review with regards to journal publications, some themes could be applied to the proposal process.

This large-scale international study measures the attitudes of more than 4,000 researchers toward peer review. In 2009, 40,000 authors of research papers from across the globe were invited to complete an online survey. Researchers were asked to rate a number of general statements about peer review, and then a subset of respondents, who had themselves peer reviewed, rated a series of statements concerning their experience of peer review. The study found that the peer review process is highly regarded by the vast majority of researchers and considered by most to be essential to the communication of scholarly research. Nine out of 10 authors believe that peer review improved the last paper they published. Double-blind peer review is considered the most effective form of peer review... Reviewers are committed to conducting peer review in the future and believe that simple practical steps, such as training new reviewers would further improve peer review.

- 11. Nobarany, S. & Booth, K. S. Understanding and supporting anonymity policies in peer review. *Journal of the Association for Information Science and Technology* 68, 957–971 (2017). doi:10.1002/asi.23711**

*Recommended:* Article addresses feasibility of true anonymity in the peer review process and perceived benefits of anonymity for reviewer and for authors/proposers. Also gives examples of how specific publishers created policies on anonymity and blind review. There is a section on anonymity and how this relates to conflict of interest, with the idea that you may not be able to disclose conflict of interest if you do not know the authors' names and affiliations.

- 12. Pier, E.L., Brauer, M., Filut, A., et al. Low agreement among reviewers evaluating the same NIH grant applications. *Proceedings of the National Academy of Sciences (PNAS)* early online 5 March 2018. doi:10.1073/pnas.1714379115**

Abstract: Obtaining grant funding from the National Institutes of Health (NIH) is increasingly competitive, as funding success rates have declined over the past decade. To allocate relatively scarce funds, scientific peer reviewers must differentiate the very best applications from comparatively weaker ones. Despite the importance of this determination, little research has explored how reviewers assign ratings to the applications they review and whether there is consistency in the reviewers' evaluation of the same application. Replicating all aspects of the NIH peer-review process, we examined 43 individual reviewers' ratings and written critiques of the same group of 25 NIH grant applications. Results showed no agreement among reviewers regarding the quality of the applications in either their qualitative or quantitative evaluations. Although all reviewers received the same instructions on how to rate applications and format their written critiques, we also found no agreement in how reviewers "translated" a given number of strengths and weaknesses into a numeric rating. It appeared that the outcome of the grant review depended more on the reviewer to whom the grant was assigned than the research proposed in the grant. This research replicates the NIH peer-review process to examine in detail the qualitative and quantitative judgments of different reviewers examining the same application, and our results have broad relevance for scientific grant peer review.

- 13. Regehr, G. & Bordage, G. To blind or not to blind? What authors and reviewers prefer. *Med Educ* 40, 832–839 (2006). doi:10.1111/j.1365-2929.2006.02539.x**

*Recommended:* A medical publisher asked for reviewer and author feedback on whether to continue the double-blind review model. Both parties were in favor. Addresses other blinding model (reverse blinding where author is concealed and reviewer is named and optional blinding).

- 14. Singh Chawla, D. Physicists cozy up to double-blind peer review. *Physics Today* (2017). doi:10.1063/PT.6.1.20171026a**

Excerpts: A black-box version of peer review in which the identities of both authors and reviewers of manuscripts are kept anonymous is receiving significant interest from physicists. Several months into a pilot program for two of its journals, the Institute of Physics (IOP) says that authors of about a fifth of submissions have chosen double-blind peer review, and they are

happy with the results. Although IOP is far from the first publisher to toy with double-blind review, its trial comes at a time when scientists are becoming increasingly vocal about improving the peer-review process.

Some have advocated for open peer review, in which both authors' and reviewers' identities are known; in some such cases, referee reports are published online free for anyone to read. But other authors feel that switching to complete anonymity would ensure a greater degree of objectivity. ..“Historically, double blind reviews have been difficult to implement,” says APS editor-in-chief Michael Thoennessen. “Referees spend time on trying to guess the authors’ identities, which then might affect their judgment whether they guess correctly or not.”...

The IOP data also reveal that the rejection rate for papers submitted under double-blind (70%) is higher than for single-blind (50%)...Despite experiencing more rejection, authors participating in a small- scale survey have given the double-blind model high marks, Harris notes, with most suggesting that it is the fairest approach.

Since there is no clear consensus on whether open review or single- or double-blind is best, Nature Physics lets referees disclose their identities to authors by signing their reports. In an upcoming trial, journal editors will actively ask reviewers if they would like to share their names with authors. Meanwhile, Harris says IOP will decide whether to adopt double-blind for all the publisher’s 40 or so journals after the pilot ends in January 2018.

**15. Snodgrass, R. Single- versus double-blind reviewing: an analysis of the literature. *ACM SIGMOD Record* 35, 8–21 (2006). doi:10.1145/1168092.1168094**

*An interdisciplinary look at the merits of single- vs. double-blind review and the efficacy of double-blind review. Assesses double-blind review from a cost-benefit standpoint and tone of article implies double-blind review is administratively onerous.*

**16. Souder, L. The ethics of scholarly peer review: a review of the literature. *Learned Publishing* 24, 55–72 (2011). doi:10.1087/20110109**

*Addresses perceived flaws and biases in the peer review system. Not a well-presented paper unto itself, in my opinion. This is a review paper on research that has been done regarding certain biases and ethical concerns in general in the review process. Most useful for gathering more articles on a particular topic, like gender or affiliation bias.*

**17. Tomkins, A., Zhang, M. & Heavlin, W. D. Reviewer bias in single- versus double-blind peer review. *Proceedings of the National Academy of Sciences* 114, 12708–12713 (2017). doi:10.1073/pnas.1707323114**

Abstract/Excerpts: Reviewers in the single-blind condition typically bid for 22% fewer papers And preferentially bid for papers from top universities and companies. Once papers are allocated to reviewers, single-blind reviewers are significantly more likely than their double-blind counterparts to recommend for acceptance papers from famous authors, top universities, and

top companies. The estimated odds multipliers are tangible, at 1.63, 1.58, and 2.10, respectively.

**18. Wittman, H., Hendricks, M., Straus, S., Tannenbaum, C. Female grant applicants are equally successful when peer reviewers assess the science, but not when they assess the scientist. [bioRxiv preprint] (2018). doi:10.1101/232868**

**Abstract:** Funding agencies around the world show gender gaps in grant success, with women often receiving less funding than men. However, these studies have been observational and some have not accounted for potential confounding variables, making it difficult to draw robust conclusions about whether gaps were due to bias or to other factors. In 2014, the Canadian Institutes of Health Research (CIHR) phased out traditional investigator-initiated programs and created a natural experiment by dividing all investigator-initiated funding into two new grant programs: one with and one without an explicit review focus on the caliber of the principal investigator. In this study, we aimed to determine whether these differently-structured grant programs had different success rates among male and female applicants. **Methods:** We analyzed results of 23,918 grant applications from 7,093 unique applicants in a 5-year natural experiment across all open, investigator-initiated CIHR grant programs in 2011-2016. Our primary outcome was grant application success. We used Generalized Estimating Equations to account for multiple applications by the same applicant and an interaction term between each principal investigator's self-reported sex and grant program group to compare any gaps in success rates among male and female applicants in the two new programs to the baseline gap in traditional programs. Because younger cohorts of investigators and fields such as health services research and population health have higher proportions of women, our analysis controlled for principal investigators' ages and applications' research domains. **Results:** The overall grant success rate across all competitions was 15.8%. After adjusting for age and research domain, the predicted probability of funding success among male principal investigators' applications in traditional programs was 0.9 percentage points higher than it was among female principal investigators' applications (OR 0.934, 95% CI 0.854-1.022). In the new program in which review focused on the quality of the proposed science, the gap was 0.9% in favour of male principal investigators and not significantly different from traditional programs (OR 0.998, 95% CI 0.794-1.229). In the new program with an explicit review focus on the caliber of the principal investigator, the gap was 4.0% in favour of male principal investigators, significantly larger than in traditional programs (OR 0.705, 95% CI 0.519-0.960). **Conclusions:** Avoiding bias in grant review is necessary to ensure the best research is funded, regardless of who proposes it. In this study, gender gaps in grant success rates were significantly larger when there was an explicit review focus on the principal investigator. Because of the quasi-experimental study design, these findings offer more conclusive evidence than was previously available about the causes of gender gaps in grant funding. Specifically, this study suggests that such gaps are attributable to differences in how women are assessed as principal investigators, not differences in the quality of science led by women.