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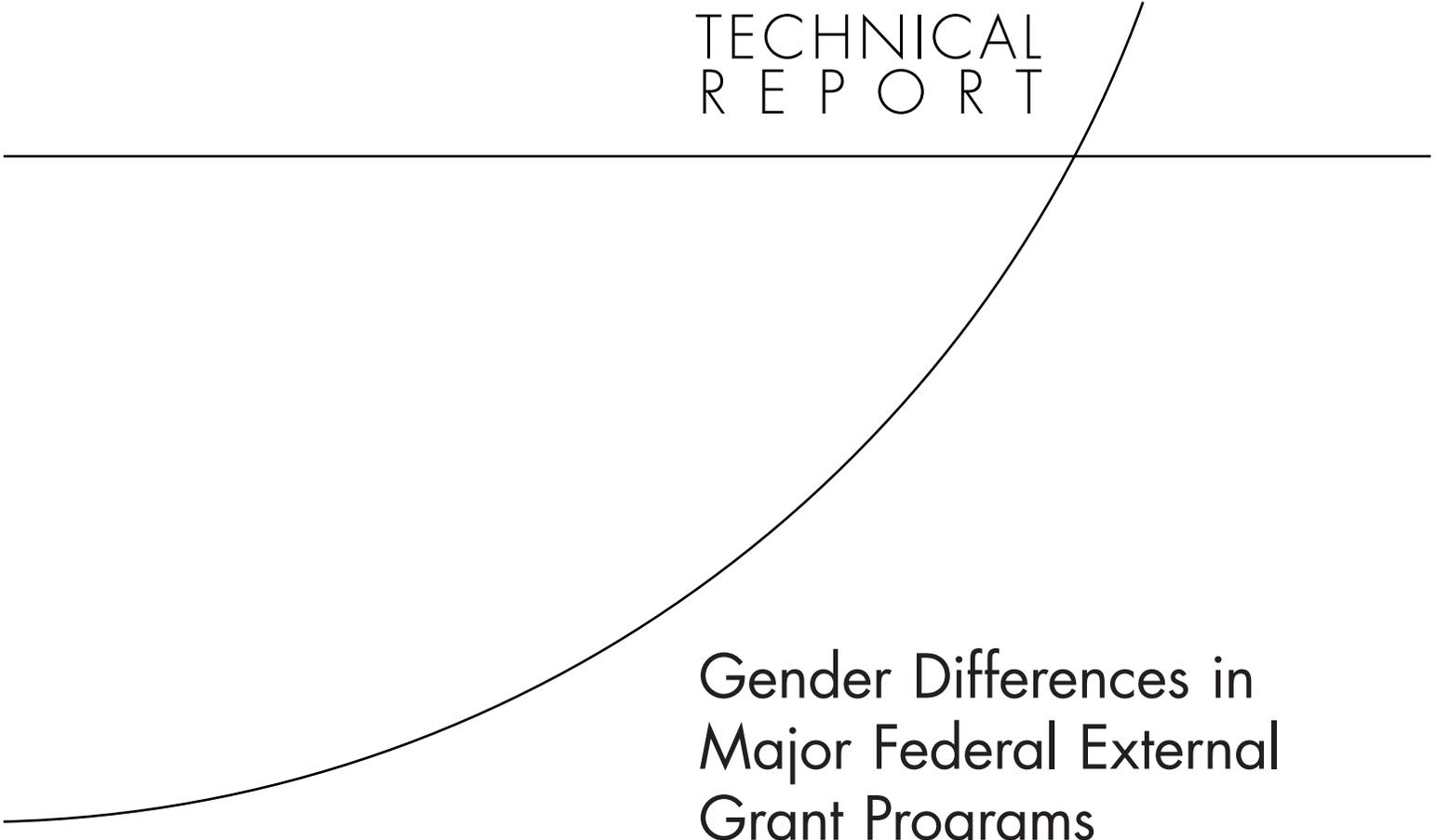
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# Gender Differences in Major Federal External Grant Programs

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# Summary

## Introduction

In an amendment to the National Science Foundation (NSF) Authorization Act of 2002, Senator Ron Wyden (D-Ore.) requested that the NSF conduct a study to “assess gender differences in the distribution of external Federal research and development funding.” The goal of the Wyden amendment was to determine whether federally funded educational programs other than sports comply with Title IX.

This research addresses this congressional directive. More specifically, the study analyzes administrative data from fiscal years (FYs) 2001 through 2003 describing the outcomes of grant applications submitted by women versus men to federal agencies. The outcomes are the probability of getting funded, the funding requested, the size of the award, and the probability of applying again. The study focuses on three federal agencies: the Department of Health and Human Services (DHHS) – and, in particular, the National Institutes of Health (NIH), which accounts for 99 percent of the research funding in DHHS; the NSF; and the U.S. Department of Agriculture (USDA). In addition, the study provides results of an analysis of the 1999 National Survey of Postsecondary Faculty (NSOPF) and the 2001 Survey of Doctorate Recipients (SDR), which include more-limited information on grant funding provided by all federal agencies.

## Key Findings

With two important exceptions, we did not find gender differences in federal grant funding outcomes in this study. At NSF and USDA, over a recent three-year period (2001–2003), there were no differences in the amount of funding requested or awarded. We found the same result when we looked at surveys of scientists, social scientists, and engineers. In one of the surveys (the 1999 NSOPF), there were differences in tabulations of the raw survey results, but those differences disappeared when we adjusted for other characteristics, including the researcher’s discipline, institution, experience, and past research output.

The major exception was at NIH, where female applicants in 2001–2003 received on average only 63 percent of the funding that male applicants received. One-third of this gender gap is explained by the underrepresentation of women among top 1 percent award winners. If we eliminate the very large awards and also control for other characteristics – age, academic degree, institution, grant type, institute, and year – the difference narrows again. Nevertheless, the gender gap is still 17 percent, which means that women still receive only 83 percent of what men receive when it comes to grant funding.

However, several important data limitations inspire caution in reaching conclusions based on these NIH results. First, NIH does not retain information about co-investigators in its applicant data system. Thus, these results are for principal investigators only. This is likely to be especially important in measuring gender differences in NIH grants because a number of awards there fund larger research teams on which, in some cases, others will do the bulk of the research. Second, some important covariates are unavailable in the NIH data. Unlike both NSF and USDA, the program type at NIH does not convey information about academic discipline. Unlike the case for NSF, we have no information about the research ranking of the university the applicant is from. Finally, the data set we received from NIH did not include the amount of funding requested. Consequently, we cannot determine whether the gender differences in funding awarded reflect applicant decisions about how to request, agency decisions about how much to award, or both. If these covariates affect the funding NIH awards as they do at NSF, it is quite possible that the gender gap would be smaller if we could control for them.

The second area where we found gender differences was in the fraction of first-year applicants who submit another proposal in the following two years. At NSF and NIH, women who applied in 2001 were less likely to apply again. The difference was much larger at NIH (more than 20 percent) than at NSF (5 percent), and it applied to both successful and unsuccessful applicants in the first year. At USDA, we also saw a similar gender gap among those who were successful in the initial year but not among those who were rejected; however, the difference largely disappeared when we controlled for other characteristics. We hypothesize that subsequent application rates may reflect underlying gender differences in application propensity, similar to what another study found in Britain. However, absent a more direct measure of application behavior, we cannot confirm our hypothesis. If women are in fact less likely to apply for funding, female and male applicants for federal research grants likely differ in ways not observed in the data sets we employed for this study, especially at NIH, where the difference is sizable. If application behavior were collected,

methods are available to correct for these unobserved differences and further our understanding of gender differences in grant funding.

## **Future Directions**

Our understanding of gender differences in federal research funding is incomplete. However, those interested in the representation of women in the federally funded research community may want to focus first on the representation of women in the applicant pool and their decisions to apply for grants. Women accounted for 21–28 percent of applicants to NSF, NIH, and USDA in recent years and for 25 percent of the survey subsamples of university and medical school researchers we analyzed. This is similar to women’s representation in the population of doctoral recipients working in science and engineering. Our study showed again that female researchers have followed somewhat different career paths than male researchers have. In particular, women are less likely to be employed in the major research universities, where most research grants are awarded.

The companion study to ours, which is being conducted at the National Academy of Sciences, will provide more information on career paths of scientists and engineers but not on grant application behavior. Future research on women in science and engineering should address application.

Finally, we note numerous limitations in the information collected in federal agencies’ grant application and award data systems. Such limitations hinder the ability to track gender differences in federal grant funding. Better tracking of gender differences in such funding would require that all agencies awarding significant grant funding do the following:

- Maintain a data system that stores information on all grant applications and investigators, including co-investigators. Ideally, each agency would have a single data system rather than separate systems for each subagency or grant program and the agencies would agree on a common list of key data elements.
- Include in the application form key personal characteristics for each investigator, including gender, race and ethnicity, institution (in a way that can be easily categorized), type of academic appointment for investigators in postsecondary education, discipline, degree, and year of degree.

- Fill in missing personal information, including gender, where possible from other applications by the same investigator.
- Record the amount requested and awarded for each proposal and any score assigned to it by the peer reviewers.
- Clearly identify initial proposals and awards, supplements that involve new funding, and amendments that involve no new funding.