

Reflections on race, ethnicity, and NIH research awards

Donna K. Ginther^{a,b,*}

^aDepartment of Economics, Institute for Policy & Social Research, University of Kansas Lawrence, KS 66045;

^bNational Bureau of Economic Research, Cambridge, MA 02138

ABSTRACT It has been a decade since “Race, Ethnicity, and NIH Research Awards” was published. Receiving the American Society for Cell Biology Public Service Award allows me to reflect on this research and its impact. In this essay, I share the story of how my research interests and professional networks provided the opportunity to do this important work. I also make the case for improved data and mentoring to address race and ethnic disparities in NIH funding.

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INTRODUCTION

I was very surprised and tremendously honored to receive the American Society for Cell Biology Public Service Award in recognition of our research on race, ethnicity, and National Institutes of Health (NIH) research funding. It is humbling to join the elite company of previous ASCB Public Service awardees. A decade has passed since we published our paper (Ginther *et al.*, 2011), and while our research team and others have investigated this important question, it remains frustrating that only 166 out of 11,980 total awardees who received funding in FY 2020 were African American/Black (NIH Advisory Committee, 2021). The ASCB Public Service award provides me with the opportunity to share the story of how this research fits into my career and to reflect on its impact and implications for the future.

I am a labor economist by training, and my work uses data to examine labor market outcomes. The economic model of the labor market contends that workers are paid for what they produce. Economists search for explanations for gender and race/ethnicity differences in wages and promotions that might include differences in education and productivity based on the theoretical model of human capital investment (Becker, 1964). As a result, economists argue

that discrimination or bias is only a possibility after all other potential explanations have been considered and ruled out. My research has focused on academic labor markets because it is possible to measure researcher productivity and to link that to career outcomes such as pay and promotion.

DO RESEARCH THAT INTERESTS YOU

The road to studying race and NIH awards started much closer to home when as an assistant professor, I wanted to study gender differences in academic promotion to learn more about the process that I was being subjected to. Using the National Science Foundation's (NSF) Survey of Doctorate Recipients (SDR), this work found that women in the humanities fields were significantly less likely to receive tenure after controlling for research publications (Ginther and Hayes, 2003). The same was true of social science fields, with the worst promotion gap being in my field of economics (Ginther and Kahn, 2004, 2014). However, we found no evidence of a gender promotion gap in physical science and engineering, but we did identify a significant promotion gap in life science fields (Ginther and Kahn, 2009). The gender gap in promotion persists in economics, despite disappearing entirely in biomedical science (Ginther and Kahn, 2021).

While developing this agenda, in 2004 I received funding from the NSF to match publications to the SDR in order to measure how research publications affected the observed gender gaps in pay and promotion. Since then, I have fought, lobbied, testified before Congress (Ginther, 2008) charmed and eventually worked with the NSF to create policy-relevant data that are now becoming available to researchers. All of the sweat equity invested in matching publications to the SDR made the series of papers including Ginther *et al.* (2011) possible. My work on gender differences in careers taught

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*Address correspondence to: Donna K. Ginther (dginther@ku.edu).

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me the importance of doing research that was important to me. If I did not care about the research questions, I would have never spent 17 years working with the NSF to create a single dataset. Tenacity is essential for a successful research career.

NETWORKS MATTER

My work on gender differences in academic careers led to the opportunity to present my research to the National Academies of Sciences Committee on Maximizing the Potential of Women in Academic Science and Engineering in 2005. Donna Shalala, a past recipient of the ASCB Public Service Award, was the chair of the committee. My research was featured prominently in *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering* (National Academy of Sciences, 2007). Laurel (Laure) Haak was the National Academies Study Director on this report. After that presentation, Laurel called me for some advice on a project about race and NIH funding in 2008 that was part of a project being planned to integrate NIH's administrative databases (Haak et al., 2012). Laurel's chief contact at NIH was Walter (Wally) Schaffer, who was working with Raynard Kington to conduct the study. At that time Wally and Raynard were well aware of the very low rate at which African Americans became principal investigators on NIH research grants. In response, they designed an extensive project that would examine race/ethnicity differences in biomedical career paths. Both Wally and Raynard felt that this project was sufficiently important that it should be conducted by well-established investigators outside the NIH to ensure its credibility and the long-term potential to affect policy changes. Wally had previously advocated for my proposal to match publications to the SDR. Wally was essential in connecting me with the right data and answering detailed questions about NIH's various training and funding mechanisms. Wally's encyclopedic knowledge of NIH was essential to doing the research correctly. By pursuing my original research on women in academic careers and proposing to match publications to the SDR, my professional networks provided the opportunity to study race and NIH funding.

THE ECONOMIC APPROACH TO STUDYING SCIENCE

We used the human capital model to inform our estimation approach to understanding NIH funding disparities. The human capital model implies that investments in education, postdoctoral training, and work experience are associated with career outcomes. The NIH IMPAC II database is a treasure trove of this kind of information on NIH applicants, and we built a dataset that I had proposed when matching publications to the SDR. We controlled for a whole host of potential explanatory variables including publications. The goal was to push the data as far as it could go in explaining the race/ethnicity

funding gap. We did not get as far as we expected. The 2011 paper could only explain one-third of the gap, leaving two potential explanations: omitted variables or bias in the review process.

The Ginther et al. (2011) paper led to the creation of the Advisory Committee to the NIH Director's Working Group on Diversity in the Biomedical Workforce (NIH Advisory Committee, 2013), but the committee criticized the study for omitting key explanatory variables from the analysis. As a result, we coded every line of 2400 Biosketches that accompanied NIH proposals from 2003 to 2006. Over 54,000 publications were matched with associated bibliometrics as well as the publications of the coauthors of the principal investigators. We identified postdoctoral training as well as funding from other sources besides NIH. Surprisingly postdoctoral training, prior non-NIH research grants, scholarly activity, and academic rank had very little explanatory power. With the Biosketch measures of publications, we found that African American/Black researchers published fewer papers, had fewer coauthors, and were cited less,

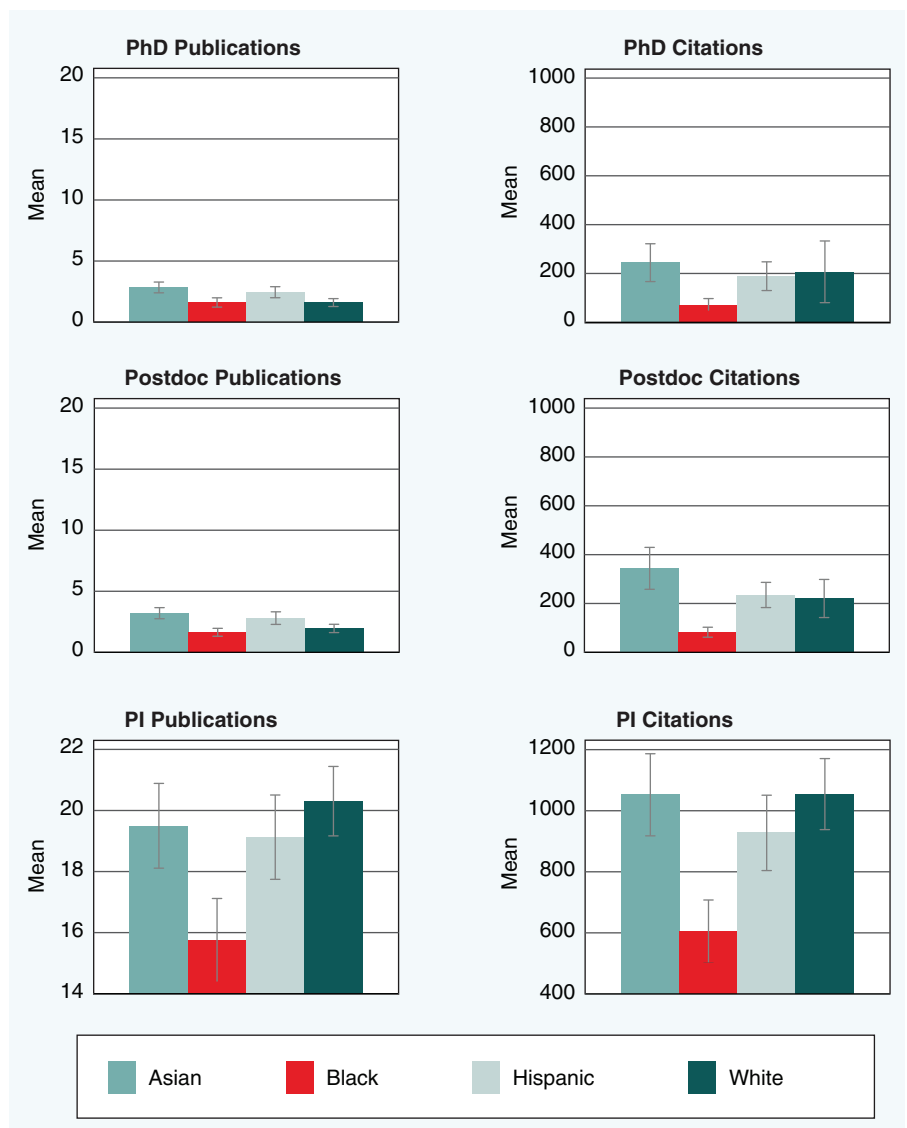


FIGURE 1: Average productivity by career stage, race, and experienced investigators. Average publications and citations by career stage and race for experienced investigators with 95% confidence intervals. Source: NIH IMPAC II, NSF Doctoral Record File, American Association of Medical Colleges faculty roster, select NIH Biosketches, Web of Science. N = 1165.

and these factors explained 50% of the funding gap between African American/Black and white investigators (Ginther *et al.*, 2018). Figure 1, reproduced from Ginther *et al.* (2018), shows a key finding.

African American/Black PhD students and postdocs published the same number of papers as white students and postdocs, but their papers received significantly fewer citations. This gap grew considerably when researchers were principal investigators on NIH proposals. We were surprised that this paper has been largely ignored in the literature given the implications it has for NIH policy.

Subsequent research has found limited evidence of bias in the review process (Forscher, *et al.*, 2019; Eroshva *et al.*, 2020; Nakamura *et al.*, 2021). Hoppe *et al.* (2019) examined each stage of the NIH review process. They found that African American/Black researchers chose topics that were less likely to receive funding at the stage where proposals are discussed. Wally Schaffer, Laure Haak, and I raised significant concerns about the implications of the Hoppe *et al.* (2019) study, and we cautioned researchers from changing their research topics.¹ We were not the only ones. On reanalysis, the Lauer *et al.* (2021) abstract concludes “The lower rate of funding for these topics was primarily due to their assignment to ICs [Institutes or Centers] with lower award rates, not to peer-reviewer preferences.”²

IMPLICATIONS FOR THE FUTURE

Raynard Kington and I have discussed how challenging it is to find definitive answers to the problem of race and ethnic disparities in NIH funding (Kington and Ginther, 2018). At that time, we argued that our results were not consistent with bias in the review process. Instead, a combination of factors partially explain the funding gap. We found that publications matter; thus further studies of why publications differ are warranted. In addition, others have found that applications from African American/Black researchers are being assigned to NIH ICs with lower award rates (Lauer *et al.*, 2021). Clearly, adjustments in the referral process or increasing budget allocations to those ICs is an important step in the right direction toward funding more African American/Black researchers.

Our 2018 paper showed that that career outcomes for African American/Black and white investigators begin to diverge at the postdoctoral stage. Knowing this timing allows NIH and the biomedical research community to enact policies to support researchers at this critical point in their careers. Mentoring matters for the diversity of the STEM workforce because studies have shown that having an instructor of color increases the success in STEM classes of students of color (Fairlie *et al.*, 2014; Oliver *et al.*, 2021; Price, 2010). I have evaluated a randomized controlled trial of mentoring female economists at research-intensive organizations. Our studies found that a 2-day mentoring workshop increased federal research grants, publications, publications in top journals, and coauthorship networks (Blau *et al.*, 2010; Ginther *et al.*, 2020; Ginther and Na, 2021). We also found that women in the treated group were significantly more likely to receive tenure at top 100 economics departments (Ginther *et al.*, 2020).

¹These comments originally appeared in a letter to *Science Advances* in response to Hoppe *et al.* (2019). We pointed out that the Hoppe *et al.* (2019) results are not comparable to Ginther *et al.* (2011, 2018) because their data mix R01 Type 1 and Type 2 awards whereas our work analyzed Type 1 R01s only.

²The Lauer *et al.* (2021) paper analyzes Type 1 R01 awards only; thus the results are potentially comparable to Ginther *et al.* (2011, 2018). However, this paper does not report award rates by race, and the probit coefficients in their regression models are not comparable to the marginal effects that we have reported.

Management consultant Peter Drucker reportedly said, “If you can’t measure it, you can’t improve it.” The work we did in Ginther *et al.* (2011, 2018) provided improved measurement and partial explanations for the race/ethnicity funding gap. Our results also point to the time when mentoring can help young scientists the most. I am heartened that NIH will finally report funding rates by race/ethnicity following the long-established process at NSF (NIH Advisory Committee, 2021), but the NIH can do more. The NIH should report data on Type 1 R01 award rates by race/ethnicity in order to demonstrate whether or not there has been progress in funding African American/Black scientists. The NIH should better monitor and document the mentoring process to ensure that students and postdocs from all races and ethnicities receive high-quality experiences that produce publications of sufficient salience that they attract citations. The NIH should also place administrative data on grant applications and awards in a Federal Statistical Research Data Center so that more researchers can examine the factors that explain racial disparities in research funding. Doing so will produce important findings that will inform policies to promote a more diverse and equitable biomedical workforce.

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