

# Non-White scientists appear on fewer editorial boards, spend more time under review, and receive fewer citations

*Keywords: science of science, race, inequality, peer review, acceptance delay*

## Extended Abstract

Disparities continue to pose major challenges in various aspects of science. One such aspect is the composition of editorial boards, which has been shown to exhibit racial and geographical disparities [1, 2, 3, 4]. Despite these studies, the literature lacks longitudinal studies quantifying the degree to which the racial composition of editors reflects that of scientists. Other aspects that may exhibit racial disparities include the time spent between the submission and acceptance of a manuscript, and the number of citations a paper receives relative to textually-similar papers, but these two aspects have not been studied to date.

To fill this gap, we compile a novel dataset of more than a million papers between the years 2001 and 2020 in over 500 different journals, handled by nearly 65,000 editors, and published by six different publishers, namely, Frontiers, Hindawi, IEEE, MDPI, PLOS, and PNAS, while identifying the handling editor of each paper. To our knowledge, this dataset is the largest of its kind to date, capturing information about the handling editor and the time spent under review for a million papers spanning multiple decades, publishers, and disciplines. Using this dataset, we are able to chart the racial and geographical disparities in the aforementioned aspects—editorial board composition, acceptance delay, and citation rates—at an unprecedented scale.

We start by examining the degree to which the scientists in any given country and race are represented on editorial boards. To begin with, we divide the percentage of editorship by the percentage of authorship from each country, resulting in a national editor-to-author ratio. Figure 1a shows that the vast majority of countries in Asia, Africa, and South America (where most of the population is ethnically non-White) are underrepresented in editorial boards (editor-to-author ratio  $< 1$ ). Overall, scientists residing in these continents account for 35% of authorship, but only 19% of editorship.

Having examined the representation of different countries in editorial boards, we now examine the representation of different races. To eliminate the above-established confounder—the country in which the scientists are affiliated—we restrict our analysis to those affiliated with U.S.-based institutions. Figure 1b shows that White scientists make up 57% of all editors, followed by Asian and Pacific Islanders (API) scientists who make up about 40% of all editors, while only 3% and 0.1% of editors are Hispanic and Black, respectively. We further compared the racial distribution of editorship to that of authorship in the past two decades, and found that, although the racial gap has been closed for Hispanic scientists, and appears to be closing for API scientists, unfortunately, the gap grew even larger for Black scientists.

Next, we turn to the second outcome of interest: the acceptance delay of papers. Specifically, we measure the relative acceptance delay (RAD)—the relative difference in acceptance delay between a given paper and the journal average. Figure 1c shows that countries in Asia, Africa, and South America have higher average RAD compared to other countries. More specifically, out of the 20 countries with the greatest average RAD, 19 are located in the above three continents.

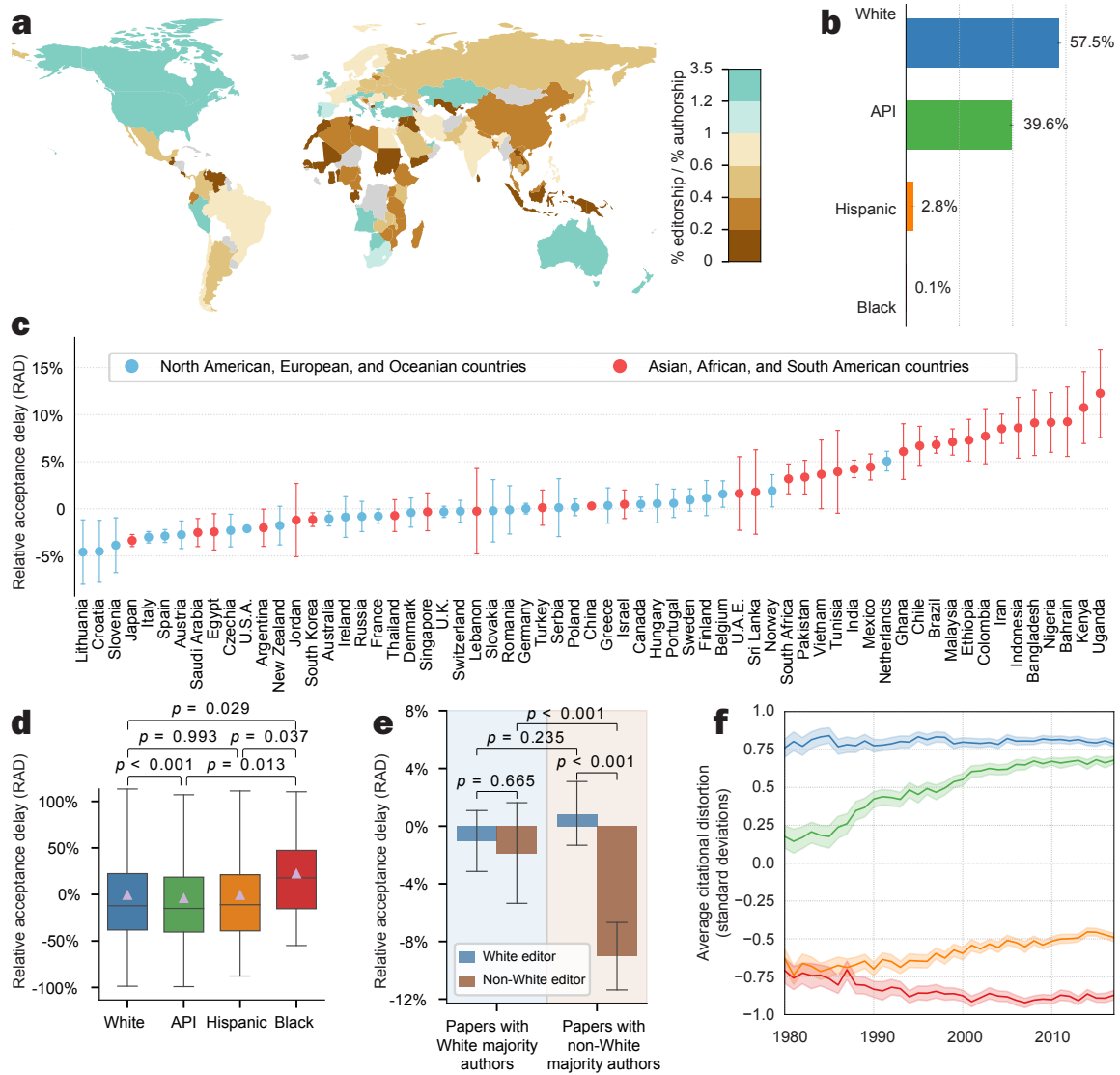
Additionally, we examine RAD across races, again, focusing on papers where the majority of authors are U.S.-based. Figure 1d reveals that papers with Black-majority authors experience significantly longer RAD compared to White-, API-, and Hispanic-majority papers. We also found that RAD remained stable over the past two decades, suggesting that Black-majority papers have been consistently spending more time from submission to acceptance compared to other races. Moreover, for papers with non-White majority authors, RAD is shorter by about 10% when the handling editor is non-White (Figure 1e).

Lastly, we turn to the third outcome of interest—citational distortion. In particular, we used a recently proposed measure that quantifies how much more (or less) scientists of different cohorts cite one another relative to the pairwise textual similarity between research papers authored by scientists from each cohort [5]. This study demonstrated geographical disparities of citational distortion. We follow the same approach, except that we focus on the four racial groups considered in our study, and again restrict our attention to papers where the majority of authors are U.S.-based. As can be seen in Figure 1f, Black and Hispanic scientists have been consistently under-cited over the past four decades, while API and White scientists have been consistently over-cited, relative to what is predicted by textual similarity.

In addition to the average trend shown above, we further analyze each publisher and each field of study in isolation, observing broadly similar trends. Taken together, our findings paint a grim picture in which non-White scientists suffer from inequalities in various aspects related to scientific publishing, potentially creating barriers to their entry and participation in academic research. Therefore, by highlighting new forms of inequalities, this study contributes to the ongoing effort of diversifying the academic workforce [6, 7, 8]. It is up to the scientific community as a whole to address these issues, with the hope of creating an ecosystem without geographical and racial disparities.

## References

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**Figure 1: Non-White scientists appear on fewer editorial boards, spend more time under review, and receive fewer citations.** **a**, The editor-to-author ratio for countries around the globe. **b**, The percentage of White, API, Hispanic, and Black editorship. **c**, RAD of each country that has at least 500 papers published by the publishers considered in our study. **d**, RAD distribution of papers with White-, API-, Hispanic-, or Black-majority authors. **e**, RAD of papers handled by editors from the same or different racial group as the majority of authors. **f**, The average citational distortion experienced by U.S.-based White, API, Hispanic, and Black scientists.