

Missing Base Rates as a Cause of Misinterpretation: A Commentary on Roberts et al. (2020)

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In an article in *Perspectives on Psychological Science*, Roberts et al. (2020) analyzed racial representation among publications and authors within three fields of psychology, restricting their analysis to publications that highlight race. However, Roberts et al. did not present population base rates to provide context for their results. As a result, they interpreted their bibliometric analysis as indicating an over-representation of White authors in social and developmental psychology (in publications that highlight race) with no consideration of base rates. I demonstrate that when base rates are considered, the data suggest White under-representation in recent decades. Roberts and colleagues also report a correlation between non-White editorship, non-White authorship, and non-White participant recruitment, and then conclude that diverse editorship causes an increase in diverse authorship and participant recruitment. They do not consider that demographic change—an overall increase in the proportion of non-Whites in the U.S.—is an alternative explanation for this phenomenon. Secondary problems with the target article are also noted.

Keywords: race, racial inequality, systemic inequality, metascience

In a recent article in *Perspectives on Psychological Science*, Roberts et al. (2020) reviewed 26,380 empirical articles published across six U.S. journals in a five-decade span. Their purpose was to assess the degree to which race was highlighted and to examine the racial representation of editors, authors, and research participants. They also aimed to examine any possible inter-relatedness among the race of journal editors, authors, and participants. From their analysis, the authors inferred that (1) “psychological publications that highlight race have been rare” (p. 1295); (2) a majority of such articles have been accepted by White editors, who publish fewer articles that highlight race (pp. 1299-1300); and (3) among articles that highlight race, most were written by White authors (pp. 1300-1301), who sampled fewer non-White participants (pp. 1301-1303).¹ The integrated story follows a waterfall model: editor demographics seem to affect author demographics, and author demographics seem to affect topic representation and participant recruitment. The authors conclude that systemic racial inequality is a problem in psychological science.

Racism has pervasive effects on many human psychological and behavioral processes. Constructs that adequately capture racialized experiences, including discrimination, bias, and segregation, must be scientifically explored, and clinicians need to acknowledge that perceived racism and discrimination continue to be insid-

ious stressors. As Roberts and colleagues propose, researchers should routinely report the racial demographics of samples, provide justifications for the racial demographics of samples, and specify how such demographics may impose potential constraints on external validity.

Nevertheless, there are sections of the article that can be easily misinterpreted because population base rates are not reported. The primary goal of this commentary is to describe how explicit reporting of base rates would have enhanced the article and perhaps led to different conclusions. I do not aim to invalidate the full article, but rather to show there are different ways to interpret certain data. The secondary goal is to briefly describe other problems with the article.

The primary problem is that the authors did not account for the demographic composition of the U.S. population when drawing their inferences. Incidentally, the choice to focus on the U.S. removes all authors from countries with majority non-White populations, which biases the sample in favor of the authors’ conclusion of White dominance, and the decision to focus on high impact-factor journals eliminates journals published in majority non-White countries. As the authors chose to

¹The standard term for non-White people is “people of color” in U.S. publications, but this term is not used in English-speaking countries that are not White-majority nations, e.g., India and Pakistan, and can cause confusion.

focus on U.S. studies only, the authors should have adjusted for fluctuations in the racial composition of the United States.² In 1970, the U.S. population was 87% White, whereas forty years later, it was 72.7% White (Ruggles et al., 2022). The authors did not account for such change. Base rate neglect is an acknowledged problem in judgment and decision making (Kahneman & Tversky, 1973), and explicit rates are crucial because Americans overestimate the proportion of Black and Hispanic Americans (Gallup, 2001). This overestimation may have caused both the readers and the authors of the Roberts et al. (2020) article to mistakenly conclude that non-White Americans are under-represented when they are equally represented or over-represented. To prevent such mistakes, many publications about inequality include national demographics (e.g., Hunt et al., 2018; Johnson et al., 2019). This information is missing from the target article.

Admittedly, the population at large is not perfect for computing base rates because articles are not written by a cross-section of the population but rather by faculty with advanced degrees in the field. For articles about race and racism, a better base rate is even more precise—full time faculty in that subfield. However, the corresponding statistics are unavailable for decades before the 2010s, and within a given subfield, the makeup of scholars interested in race is not equal to the makeup of the field. Roberts and colleagues used the author makeup of *Cultural Diversity and Ethnic Minority Psychology* to get a base rate, and the weakness of this strategy is discussed later.

However, one should not make the perfect the enemy of good. The makeup of the population at large can be good—it sets a plausible range for each target group. For example, knowing that 80% of the Indian population is Hindu is useful because it entails that researchers should not expect a 50:50 ratio of Hindus to non-Hindus in most sectors. Similarly, it is useful to acknowledge that the population of the U.S. was nearly 90% White in some past decades because it entails that one should not expect a 50:50 ratio of White to non-White authors in that period, which is the implicit equality criterion used by Roberts and colleagues. If one finds that most authors were White in those past decades, the label “roughly proportional representation” would be more appropriate than “inequality.” Indeed, in their conclusion, Roberts et al. propose that journals “consist of diverse editors, reviewers, authors, and participants—ideally at rates that mirror diversity at the national level or within psychology” (p. 1304). Despite this reference to diversity at the national level, Roberts et al. did not present statistics about demographic diversity from 1970 through the present, which was their

focus. When national demographics are considered, one may also find that a group is a numerical minority but over-represented. For instance, Asian Americans are a numerical minority at universities like Harvard, Stanford, and Princeton, but they were over-represented by a factor of three or more at these universities during the 2010s (Arensen, 2007). Without a base rate to anchor their interpretation, readers are likely to heuristically assume that a group in a numerical minority is under-represented.

A presentation of the Roberts et al. statistics with base rates added for context is in Table 1. On the left side, the table shows, by decade, the proportion of U.S. residents, aged 25 and older, who are non-Hispanic White. This base rate is more precise than a general population figure because article authors have normally completed a doctorate, typically obtained after the age of 25. For the 1970s-1990s, demographics are from the decade’s initial year due to availability. For other decades, data are from the midpoint year. The third column also presents the proportion of non-Hispanic Whites in U.S. psychology faculty from 2019 in the 2010s row, the only year with available statistics (Bichsel et al., 2019). Author and editor counts on the right side are from the target article graphs (except in the average row). These counts were extracted using *Engage Digitizer* and thus, as in the target article, exclude individuals who were uncategorizable. To be comprehensive, cognitive psychology is included but Roberts and colleagues noted that they included a graph of cognitive psychology authors “for graphical purposes only because there were too few publications to draw firm conclusions” (p. 7). In addition, the total number of race-related cognitive psychology publications was only 13.

The data in Table 1 indicate that in the two most recent decades, White authors were somewhat under-represented—in three cells, their proportion is considerably lower than the base rate, and in one cell, it is marginally lower. Conversely, non-White authors were over-represented in these cases, even though they were in a numerical minority. In the 2010s, White authors were under-represented relative to both the population base rate and the psychology faculty base rate in developmental and social psychology, the only subfields with a large sample size. Although these data still point to an over-representation of White editors-in-chief overall,

²The title of the article is also misleading. It hides the exclusive focus on the U.S. A more accurate title would be “Racial Inequality in American Psychological Research.” It is customary to note a country name when a focus is on a specific country (e.g., Adair et al., 1996; Taft and Day, 1988; Watson, 1934

Table 1

Representation of Non-Hispanic Whites in the Adult (25+) U.S. Population, and Among Authors of Race-Related Articles and Editors-in-Chief of Journals

| Decade | U.S. Non-Hispanic White % | | Developmental | | Social | | Cognitive | |
|----------------------|---------------------------|------------------------------|-------------------|---------|-------------------|---------|-------------------|---------|
| | Pop. Ages 25+ | Psychology Faculty Full-Time | Authors (n = 773) | Editors | Authors (n = 551) | Editors | Authors (n = 13) | Editors |
| 1970s | 86.1 | | 97 | | 91 | | | |
| 1980s | 82.9 | | 87 | | 87 | | | |
| 1990s | 79.1 | | 88 | | 82 | | 100 | |
| 2000s | 70.1 | | 77 | | 68 ^a | | 42 ^a | |
| 2010s | 65.4 | 83.5 | 57 ^a | | 62 ^a | | 88 | |
| Average ^b | 76.7 | | 79.5 | | 77.0 | | 74.8 ^b | |
| Overall ^c | | | 71 | 89 | 72 | 95 | 69 | 100 |

^a The figure suggests Whites were somewhat under-represented.

^b This is the unweighted average across the five reported decades, and does not account for population growth.

^c These statistics are from Figure 2 in the Roberts et al. article.

they falsify the claim that the psychology of race and racism continues to be dominated by Whites.

To be sure, the authors computed the demographic makeup of authors in *Cultural Diversity and Ethnic Minority Psychology*, and these rates suggest that one journal which focuses on race has more non-White authors than White authors. However, it is doubtful that the journal *Cultural Diversity and Ethnic Minority Psychology* provides an unbiased estimate. Only some scholars submit to this journal, and only some of those have manuscripts accepted.

In addition, the authors considered the hypothesis that research conducted by non-White authors “is simply of lower quality than research conducted by White authors” (p.1301). However, to properly test this hypothesis, the authors would have to know the proportion of rejections received by race.

In the future, scholars may wish to use different base rates for every type of analysis. Undergraduates are overrepresented in psychological research (e.g., Arnett, 2008; Hanel and Vione, 2016; Henrich et al., 2010). For research participants, a useful base rate (outside of developmental and child psychology) might therefore be Americans in the 18-22 age range with added information about international students if available.

If individuals are drawn from a specific birth cohort (or set of cohorts), authors should account for the fact that the demographics of younger cohorts differ from those of older cohorts, and such differences matter for drawing accurate inferences. Roberts and colleagues mention that the U.S. is “increasingly diverse”

(p. 1303), which indicates they may have been aware that younger cohorts are more diverse. Yet they did not consider cohort differences when explaining the higher relative diversity in developmental psychology. Participants in this field are primarily younger individuals. They come from a cohort that is more diverse.

Researchers should also account for the sociological fact that an article does not merely emerge from an author, but also from a geographic area and historical era. Geography is a factor because psychological researchers draw convenience samples from their geographical vicinity and their institution. If a psychology article originated in a geographical area where the population is mostly White, the participants have a high probability of being White regardless of the topic. One must also account for demographic change over time. If a psychology paper originated in a historical era when the U.S. adult population was 90% White, it is also more likely to have a White editor, a White first author, and White participants. To put it differently, the population is a pool that supplies authors, participants, and editors. As the population gets more diverse, all three groups will include more people of color, which can create spurious associations between editor diversity and author diversity. Figure 3 in the Roberts et al. article is consistent with this diversifying-pool explanation. One should therefore be cautious when inferring that non-White editors more frequently accept articles with non-White participants.

Lastly, researchers should be clear about how they operationalize equality and inequality. In Western democ-

racies, equality is usually construed as homogeneity or equivalence of factors across persons and ethnic groups (Rosenvallon, 2013; Walker, 2020). However, both laypeople and scholars construct inequality in different ways (Jachimowicz et al., 2020; Phillips et al., 2020). If the distribution of two groups, say Whites and non-Whites, is homogeneous across every segment of society, one can claim that equality is obtained because there is no over-representation or under-representation of any group in any sector. (This is not the only way to construe equality, but it is the norm.) The authors of the target article did not report over- or under-representation, but nevertheless used the term “inequality” in their title.

Secondary Problems and Errata

The article has some weaknesses that are unrelated to the central point of my commentary but nevertheless worth noting:

1. The authors stated, “From the 1970s to the 2010s, only 5% of publications highlighted race” (p. 1298) and such publications “have been rare” (p. 1295), but they did not justify this claim. Given the breadth of psychological science, 5% might a relatively large proportion. Publications on race may outnumber publications on other popular topics.
2. In reporting how frequently psychology publications highlight race, the authors rounded 1,511 of 26,380 to 5% when the percentage to one decimal place is 5.7% and rounds to 6%.
3. In Figures 2 and 3, the authors did not plot a line for authors of unknown race. Although this decision is mentioned in a footnote, the graph can be visually misread, i.e., some may infer 100% of the editors-in-chief in two cognitive psychology journals were White.
4. Roberts et al. note that 387 of 433 publications in psychology were edited by White editors but express this figure as 92% instead of 89%.

Conclusion

Science thrives on criticism, both conceptual and empirical (Popper, 1963). Hence, by subjecting claims to scrutiny scientists can hope to identify and correct errors (O’Donohue, 2013; Quine & Ullian, 1978). In the present commentary, I present alternate ways to interpret the data in the Roberts et al. article. To make it easier to interpret data in an unambiguous manner, future authors may find these recommendations useful:

1. Provide meaningful base rates for the overall period in question and for each decade or year of that period.
2. Using base rates, present an analysis where a group’s over-representation or under-representation is assessed.
3. If the analysis is limited to one nation, include the nation’s name in the article title.

The goal of this commentary is not to suggest that there were flaws in the methodology of the Roberts et al. article, but rather to note that additional information would have made the findings less prone to misinterpretation.

As an immigrant to the U.S. from India, I would also encourage diversity scholars to separate race from national culture. Although the U.S. has a multitude of ethnic groups, its educational institutions are culturally grounded in the European tradition, and thus both Whites and non-Whites in the U.S. do intellectual work that follows from Classical and Enlightenment European thinkers. Multiculturalists may over-estimate the degree to which Americans with non-European ancestry can draw from non-European perspectives. Increasing the racial diversity of the profession to match the American population will not cause researchers to draw on non-Western thinkers. If psychology were to magically achieve perfect international equity, only 4% of psychology papers would be published by Americans overall and only 1-2% by non-White Americans. Given the current inequality of scholarship at the cross-national level favoring the U.S., all Americans including non-White Americans are unfairly privileged. The authors elide this problem by focusing exclusively on the U.S.

To reiterate an earlier point, this commentary is focused on one segment of the paper and is not intended to challenge all the findings in Roberts et al. (2020). Nevertheless, some guides to interpretation such as base rates would have helped readers interpret their statistics. The inclusion of base rates permits readers to discern under-representation and over-representation, and mitigate the risk that readers make incorrect inferences.

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