Sampling bias and reporting bias in Medicine and Clinical psychology : Current state and policy recommendation

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Introduction

Behavioral sciences have documented biased sampling in research participants, drawing predominantly from Western, educated, industrialized, rich, and democratic **(WEIRD) societies.**

Members from WEIRD societies have been found to be unusual and unrepresentative of humans in general, leading to replication crisis and even a theory crisis in behavioral sciences. How such **sampling bias** manifests in clinical research, and how it affects the **communication** of scientific findings remain unclear.

Here we examined potential **sampling bias** and **reporting bias** in clinical psychology and medicine.

Methods

Journals: included 1202 empirical articles published in 2020 from four leading medical journals (*Lancet, JAMA, BMJ, and NEJM*) and seven clinical psychology journals (*Clin Psychol Sci, J of Abnorm Psychol, J Consult Clini Psychol, J Couns Psychol, Schizophr Bull, Depress Anxiety,* and *Int J of Eat Disord*).

Sampling bias: encoded four characteristics of the sample from the methods and results sections of each article, including country/region, race, gender, and age.

Reporting bias: we encoded the same information but from the title and abstract. Reporting bias is evident when characteristics of the sample were disproportionally emphasized in the title and abstract.

Results

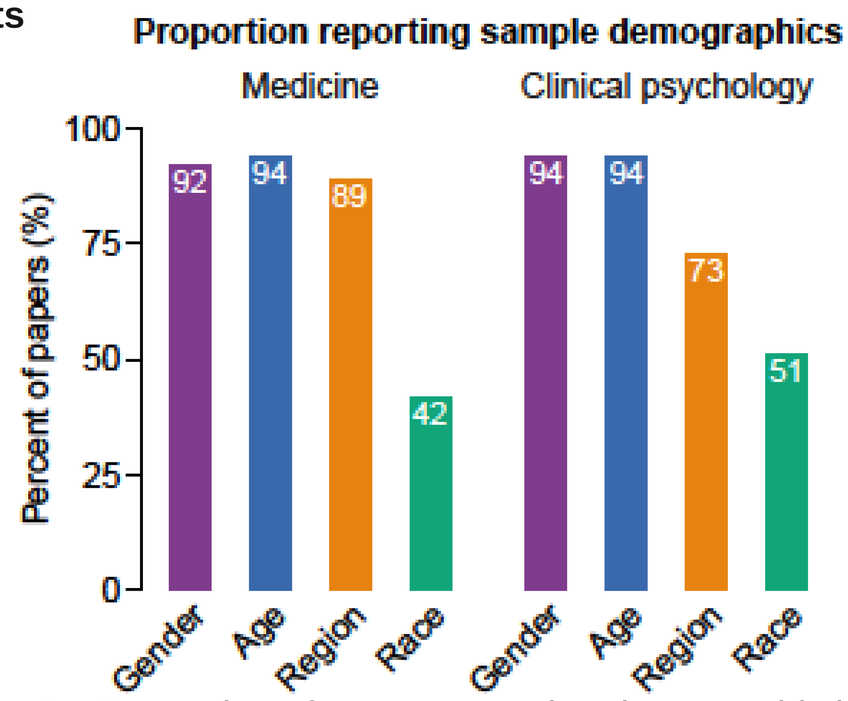

Figure 1 Proportion of papers reporting demographic information

The two fields exhibited same reporting rates for age, $X^2 = 0$, $p = .986$, and similar reporting rates for gender, $X^2 = 1.3$, $p = .253$, but they diverged for region, and race. Specifically, medicine reported more frequently on region, $X^2 = 46.3$, $p < .001$, but less frequently on race, $X^2 = 9.8$, $p = .002$.

Sampling Bias

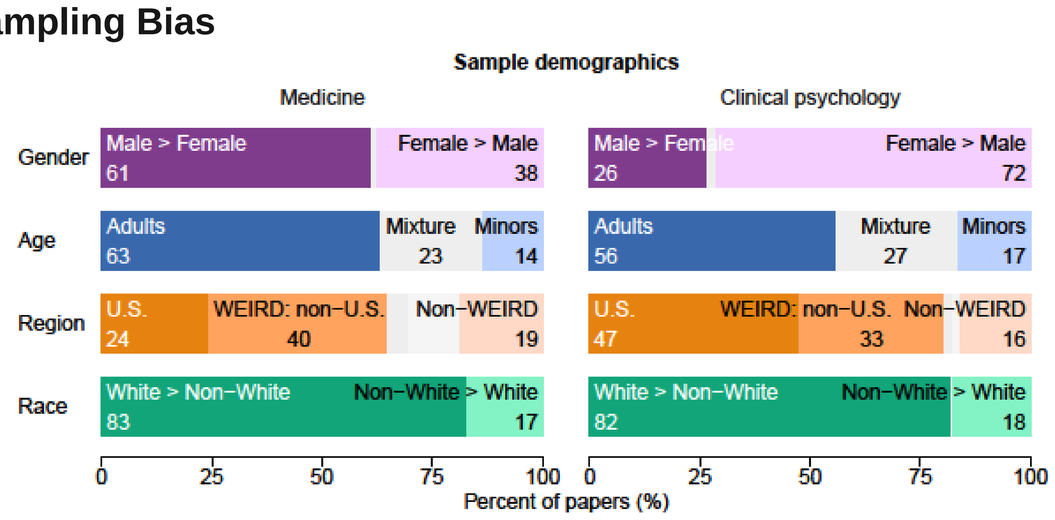

Figure 2 Demographic characteristics of participants in medicine and clinical psychology journals

Age: Two fields primarily focused on adults-only samples, constituting 63% and 56%, $X^2 = 0.95$, $p = .330$.

Race: Two fields predominantly studied majority-White samples, at 83% in medicine and 82% in clinical psychology, $X^2 = 0.002$, $p = .961$.

Gender: medical journals primarily included majority-male samples (61%), while clinical psychology journals predominantly featured majority-female samples (72%), $X^2 = 133.8$, $p < .001$.

Region: Two fields differed in the proportions of U.S. versus non-U.S. WEIRD regions, $X^2 = 31.9$, $p < .001$.

Reporting Bias

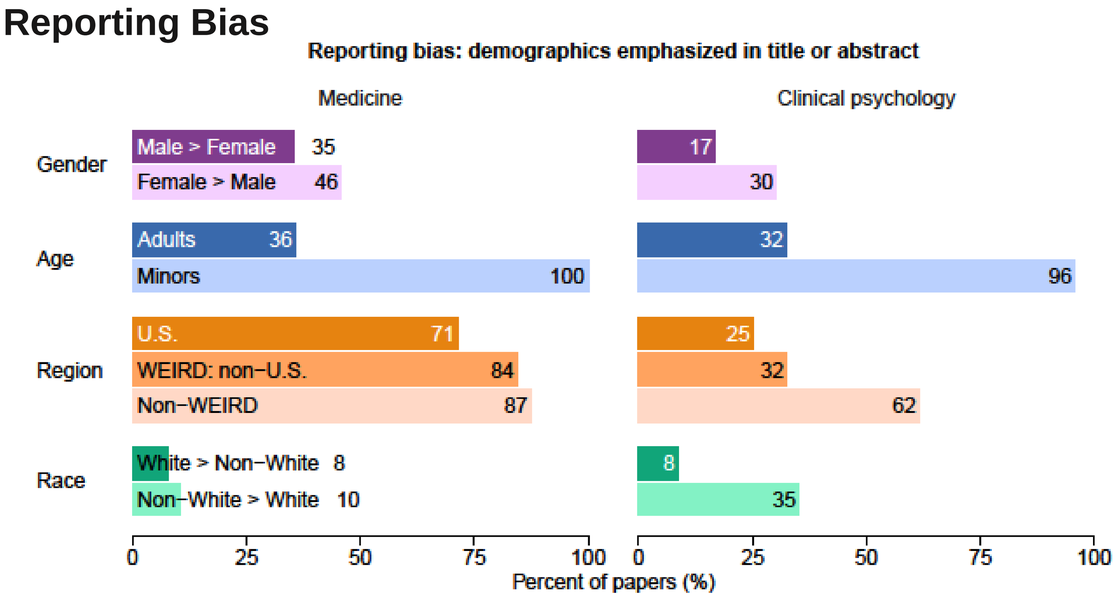

Figure3 Biases in reporting demographic characteristics of participants in medical and clinical psychology journals

Age: a bias consistent across medicine and clinical psychology, $X^2 = 89.3$, $p < .001$.

Gender: a male bias in medicine, $X^2 = 4.9$, $p = .028$. This bias was more pronounced in clinical psychology, $X^2 = 10.5$, $p = .001$.

Region: a U.S. bias in medicine, $p < .001$. a more pronounced and generalized U.S. and WEIRD bias in clinical psychology, $p < .001$.

Race: a numeric but non-significant White bias in medicine, $p = .527$. a marked White bias in clinical psychology, $X^2 = 26.6$, $p < .001$.

Policy Recommendation

1. Standardized reporting sample demographic information

Academic journals: including reporting basic demographic properties as a mandatory requirement in their submission guidelines, providing a standardized reporting template.

University education: including standardized reporting of sample demographic properties in the curriculum of academic writing to improve the reporting consciousness.

Academic organizations: publicly promoting initiatives to encourage researchers in medicine and clinical psychology to emphasize the importance of reporting sample demographic properties.

2. Improving sample diversity in clinical research

International cooperation: Promoting collaboration among researchers from different regions and cultural background.

Special funding: setting up special funding to support research targeting underrepresented individuals in samples.

Diversity of editorial boards: improving the proportion of ethnic minorities on international journal editorial boards.

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