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Beyond gender: The biological impacts of inequality through the lens of intersectionality

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Inequality, long considered merely a difference in resource allocation and health outcomes, is emerging as a quantifiable predictor of health conditions and biological changes (1, 2). Zugman et al. deepen our understanding of inequality's biological and physiological impacts (3). The authors examined brain cortical thickness and surface area differences between healthy adult men and women in 7,876 MRI scans from 139 samples. They found thinner right hemisphere cortices in women from countries with greater gender inequality (3). Accelerated cortical thinness is linked to signs of aging, psychosis (4), and Alzheimer's (5), suggesting that inequality accelerates brain aging. Although Zugman et al. focus on gender differences, the implications extend to structural discrimination, racial inequity, and intersectionality.

The cross-country comparison revealed gender differences in MRI scans and indicated that, in gender-equal countries, brain scans displayed no significant differences or even thicker regional cortices in women compared to men. These findings reinforce theories on how "stress gets under the skin" while contesting the idea of biological determinism that has rationalized race and gender differences in the medical world. Examining health outcomes from a person-in-environment model forces researchers to confront how social factors influence peoples' experiences. Intersectionality, a framework that examines how various aspects of individuals' identities interact, plays an important role in understanding individuals with multiple marginalized identities and showing how macro-level factors ultimately affect individuals on a micro-level. For example, women of color in the United States face multiple layers of discrimination and stressors leading to compounded corresponding psychological outcomes.

Similarly, minority stress theory (MST), which emphasizes how persistent stressors related to discrimination, stigma, and social disadvantage, has particular implications for minority groups (e.g., lesbian, gay, bisexual, transgender, queer/questioning (LGBTQ) community) experiencing adverse mental (6) and physical health outcomes (7). Zugman et al. validate prior quantitative findings that social factors influence physical biology (i.e., structures of the brain) which then impact behavioral, cognitive, and functional health outcomes (8, 9).

While Zugman et al.'s results are meaningful, the findings are restricted to higher and middle-income countries due to reliance on MRIs. Individuals in lower-income countries experiencing increased inequality due to structural factors such as socioeconomic status, political environment, healthcare and education access, or marginalized identity status are limited in this sample size. The finding effects might have been stronger if Zugman et al. were able to sample countries with more extreme structural gender inequality, such as Afghanistan, where 80% of women are illiterate due to the Taliban's restrictions on female education (10). Additionally, comparisons of countries that have primarily homogeneous populations against those with heterogeneous populations would highlight the implications of intersectionality and, potentially, compounding effects of racism on women of color. These factors, and likely associated health outcomes, emphasize the need for future research to expand upon the original findings and emphasize the essentiality of an interdisciplinary understanding of health. Utilizing critical theory and MST, researchers can understand the interplay between social structures and biological sciences to further advance personalized and equitable medicine.

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