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Difficulties in the interpretation of racial differences in allostatic load

Geronimus et al. find support for the weathering hypothesis in a perceived increase in the racial disparity in allostatic load over the life course.1 That racial disparities in the consequences of stress would increase over time seems entirely plausible. Possibly the effects sizes of the difference between average allostatic levels of blacks and whites might show an increase with age.

But the use of a dichotomized measure in the manner employed in this study has methodological problems. In general, relative differences in experiencing an outcome tend to increase (while relative differences in avoiding the outcome tend to decline) as the outcome grows more prevalent, solely for reasons related to the shape of the risk distributions of each group.2,3 Such tendency makes it harder to discern whether disparities are increasing with age in any meaningful sense with respect to an outcome, like having an allostatic load of 4 or greater, that grows more prevalent with age. That is, a true tendency for disparities in high allostatic load levels to increase with age – such as might be reflected in increasing effects sizes – may not be sufficient to outweigh the statistical tendency for the disparity in rates of exceeding a certain allostatic level to decline simply because allostatic loads increase with age.

The Geronimus study seems nevertheless to find that the relative black-white differences are increasing with age. But this seeming increase is a consequence of the use of odds ratios in circumstances where an outcome is sufficiently prevalent that relative odds do not approximate relative risks. The underlying rates of having allostatic levels of 4 shown in parentheses in Geronimus's Table 1 make clear that, while for each gender the black-white ratio of the odds of having an allostatic load of 4 or above is highest for the oldest age group, the black-white relative risk of having such an allostatic load is lowest for that group. Similar interpretative issues are involved with the adjusted figures.

The same parenthetical figures also make clear that the relative risk of having allostatic levels below 4 is highest in the oldest age group. The fact that one reaches opposite conclusions about whether the relative size of the disparity increases with age depending on whether one examines the rates of experiencing or the rates of avoiding the outcome highlights the difficulties in interpreting health disparity patterns using dichotomous measures.

It warrants note that some commentators prefer odds ratios precisely because, unlike relative risks, odds ratios show the same proportionate difference whether one examines the presence or absence of an outcome.4,5 However, like the relative risks of experiencing or avoiding an outcome, odds ratio tend to change systematically as an outcome grows more or less prevalent regardless of whether there is a meaningful change in the relative situation of two groups.6,7 Thus, odds ratios do not provide an effective means of identifying differences between the relative situations of blacks and whites in different age groups that are not simply the consequence of greater prevalence of an outcome among the older age groups. Hence, where, as

in the case of allostatic load, comparisons of the size of disparities can be measured by continuous measures rather than dichotomous measures, use of the continuous measure seems the preferred approach.

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