Addressing racial inequities in neuropsychological assessment requires international prescriptive standards, not demographically adjusted norms

Michelle Fernandes, Adejumoke Idowu Ayede and Karen Blackmon

In their forward-looking Comment, Byrd and Rivera-Mindt address longstanding racial inequities in neuropsychological assessment (Byrd, D. A. & Rivera-Mindt, M. G. Neuropsychology's race problem does not begin or end with demographically adjusted norms. *Nat. Rev. Neurol.* **18**, 125–126; 2022)[1]. We agree with their premise that race serves as an imperfect proxy for a spectrum of shared exposures to the effects of systemic racism[2]. We agree that, because these exposures are linked to adverse neuropsychological outcomes, they should be measured and considered in neuropsychological assessment. Our concern is that the continued use of race-based adjustments risks propagation of entrenched scientific racism by justifying differential thresholds for disparate, ill-defined racial populations. Not only would the clinical application of demographically adjusted norms be tedious in regions (such as Africa and Asia) with a multiplicity of ethnoculturally and linguistically diverse populations, but also the rationale for such adjustments fundamentally begs an investigation of the socio-ethnocultural neutrality of existing neuropsychological tests.

Recent reports from multisite studies of neurodevelopmental outcomes in young children — including the INTERGROWTH-21st project (five countries)[3], INTERBIO-21st study (six countries)[4] and an NIH-funded observational study (four countries)[5] — converge on two crucial findings. First, within-population variability is far greater than between-population variability when basic health and nutritional needs are met and when outcomes are measured on standardized, culturally unbiased tests[3,5,6]. Second, epidemiological differences between populations are largely environment-driven[4]. Although these studies probed outcomes in children below 3 years of age (which limits generalizability), the findings provide a basis upon which to argue against the rationale for demographic-specific norms.

We advocate for the construction and application of international prescriptive standards (instead of references), comprising individuals specifically recruited to control for most, if not all, major environmental exposures known to negatively influence neuropsychological outcomes. This approach has successfully been applied to the measurement of early child growth[7]; fetal skeletal growth[8]; and neurocognitive, psychomotor and behavioural outcomes at 2 years of age[9]. These tools and their accompanying standards have negated the need for demographic adjustments when applied in clinical practice and research.

Study designs aimed at deriving norms for neuropsychological tests have largely focused on describing how individuals, in a specific setting and time, 'have' attained outcomes (references) as opposed to describing how individuals in all settings 'should' attain the outcomes of interest (standards). The WHO Multicentre Growth Reference Study addressed the technical and logistical complexities of constructing standards[10]. For ease of communication, we simplify their approach into a 'PIE' test that can be used to guide future test development: 'P' stands for the 'prescriptive' selection of normative samples by controlling for key exposures; 'I' for a diverse 'international' sampling frame; and 'E' for outcome 'equivalency' (that is, greater intragroup than intergroup variability) between geoculturally disparate populations across independent measures.

We agree that neuropsychology's race problem neither begins nor ends with demographically adjusted norms. These norms are an interim solution to a complex methodological challenge. Instead, we advocate for the construction and implementation of prescriptive international standards.

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Competing interests
The authors declare no competing interests.