

Assessment of differential item functioning in the Perceived Stress Scale-10

reporting higher perceived stress. Items 3 and 4 functioned differently by ethnicity, with white populations reporting increased perceived stress. Items 3 and 9 functioned differently by education, with higher educated participants reporting increased perceived stress, while items 4 and 8 functioned such that lower educated participants reported increased perceived stress. The adjusted mean item scores were never more than one third of a point different (on 5 point scale).

Discussion

While statistically significant differential item functioning was observed for several items, all of the items appeared practically invariant to the exogenous variables, demonstrated by extremely small β s with narrow confidence intervals and the remarkably similar adjusted item means. These findings may be compared to a reported 2 mm reduction in blood pressure, with the 95% CI ranging from 1 mm to 3 mm; while an association is observed, it is near meaningless.

Strong evidence for unidimensionality of the PSS-10 (a prerequisite to performing such analyses) was previously provided. Using a purified sub-scale (total PSS-10 minus statistically significantly biased items) as the proxy for the latent variable did not appreciably change the results. The present analysis strategy may be insensitive to low levels of differential item functioning when the measurement scale consists of less than < 19 items⁸, therefore analysis using methods derived from item response theory would confirm the present

findings. Combination of the potentially slightly biased items may explain the apparent test level bias towards women reporting higher levels of perceived stress in the PSS-10.

In summary, while several items exhibited statistically significant (p value < 0.05) differential item functioning by sex, race and/or education, none exhibited practically meaningful differential item functioning for the PSS-10 in a large ($n = 2264$) random sample of US adults. The finding of relative item invariance to sex, race, and education suggests continued widespread use of the PSS-10. However, the possibility of test level bias resulting from combined item level differences in the PSS-10 should be explored.

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1 Nunally J, Bernstein I. Psychometric theory 3rd ed. New York: McGraw-Hill, 1994.

2 Dean K, Holst E, Kreiner S, et al Measurement issues in research on social support and health J Epidemiol Community Health