

Burn survivors may display high extreme response style (ERS) bias that masks their true Life Impact Burn Recovery Evaluation (LIBRE) Profile scores.

Significance: Measurement and understanding of ERS, the tendency to select the most negative/positive option despite one's true ability, is essential to improve clinical utility of the LIBRE Profile and other patient reported outcome measures.

Objective: To determine if ERS distorts the LIBRE Profile scores, and if so, how that distortion affects the interpretation of results.

Population: This analysis used data from sample of 601 burn survivors in the initial LIBRE Profile development study.

Results: The root mean squared bias (RMSB) (in this analysis, the average effect the high ERS has overall on the average scores of this sample) was 0.5, 0.35 and 0.27 standard deviation units for the Family and Friends, Social Interactions, and Social Activity scales, respectively.

Lessons Learned:

- High ERS (masking low true scores) was less likely in individuals who were older, had participated in a support group, or selected to self-administer the measure
- High ERS was more likely in individuals who had a face burn
- Future work can consider whether ERS bias is affecting scores when measuring the psychosocial impacts of burn injuries and other health conditions

Figure 1. Example of Response Category Curves with Different HERS Levels
Figure 1.1: Category Characteristic Curves without HERS bias ($\theta_{HERS}=0$)

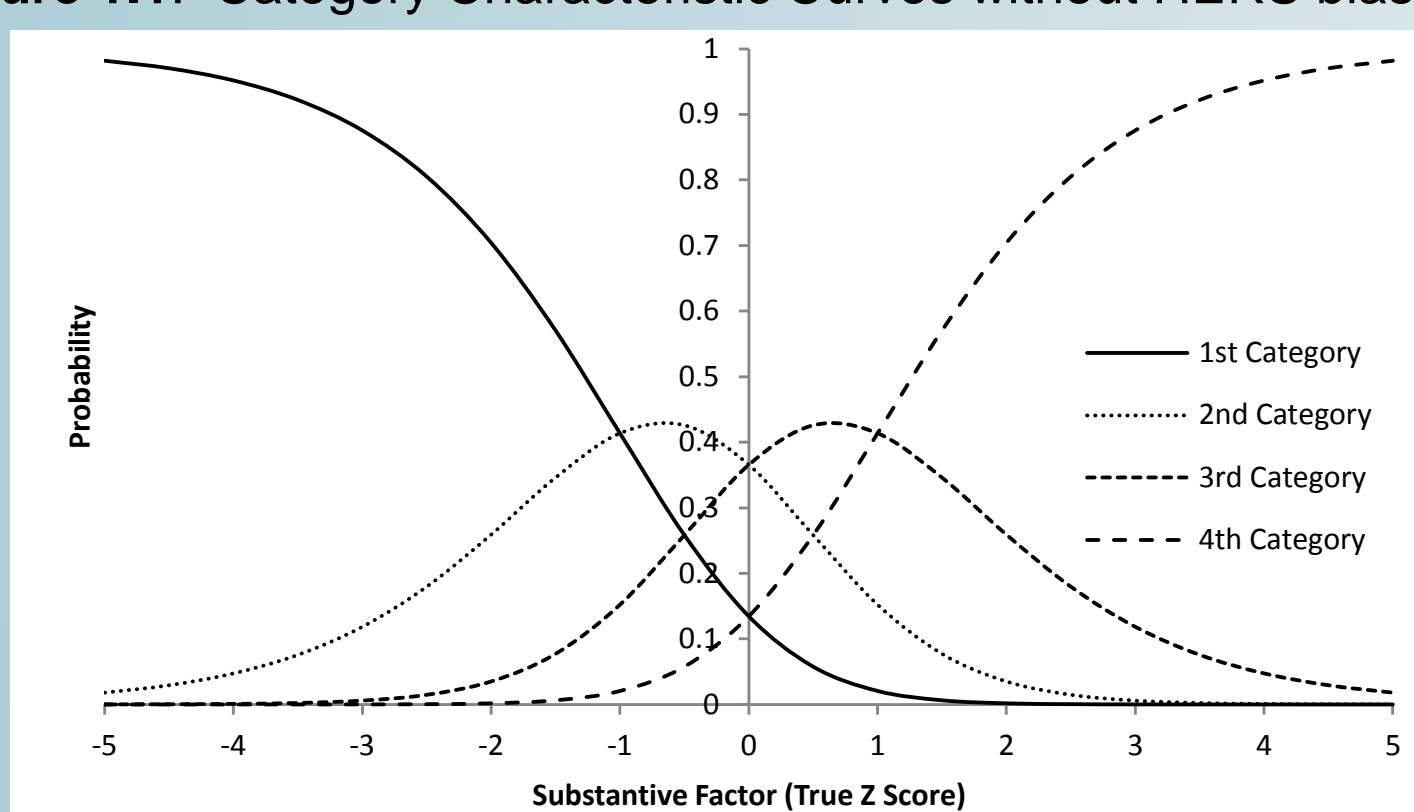


Figure 1.2: Category Characteristic Curves with positive HERS bias ($\theta_{HERS}=1$)

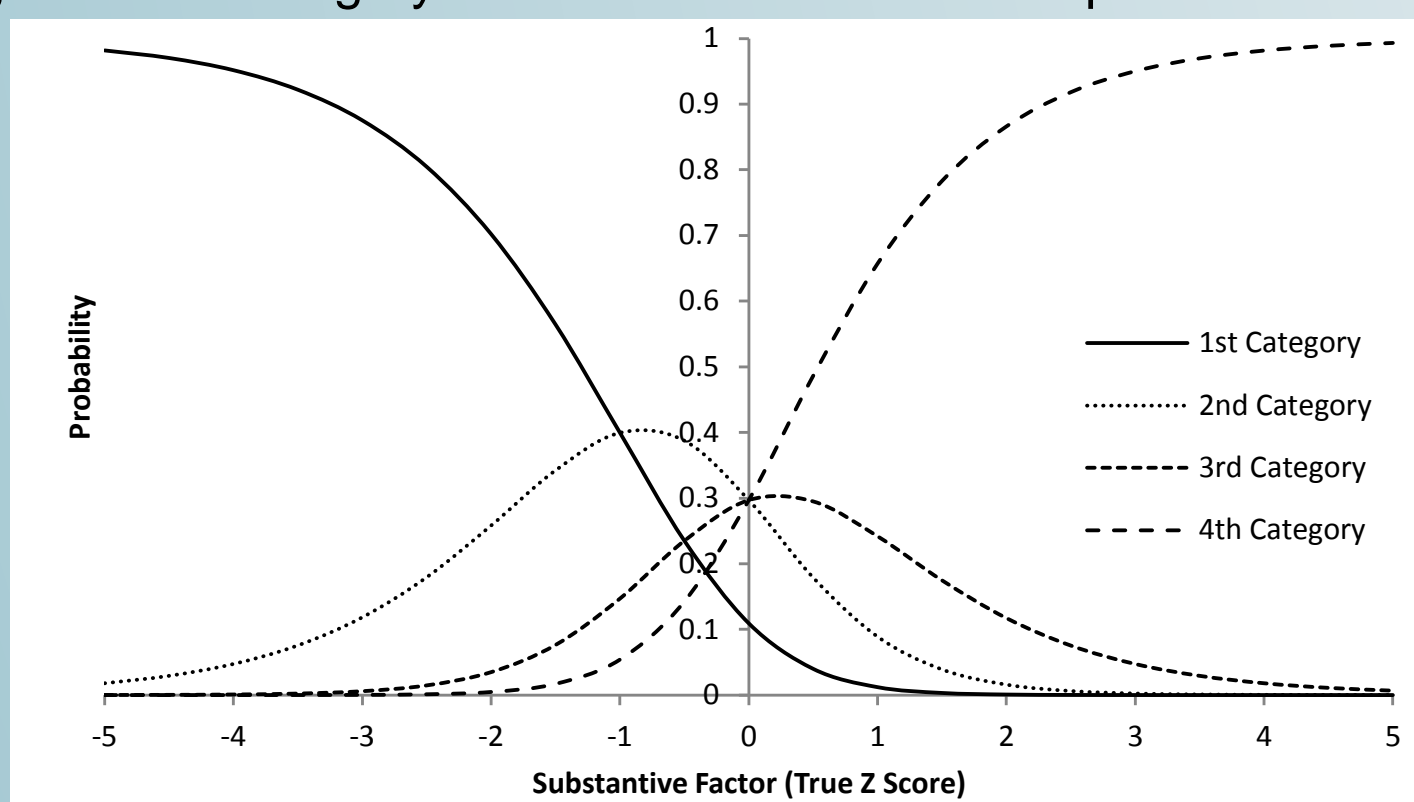
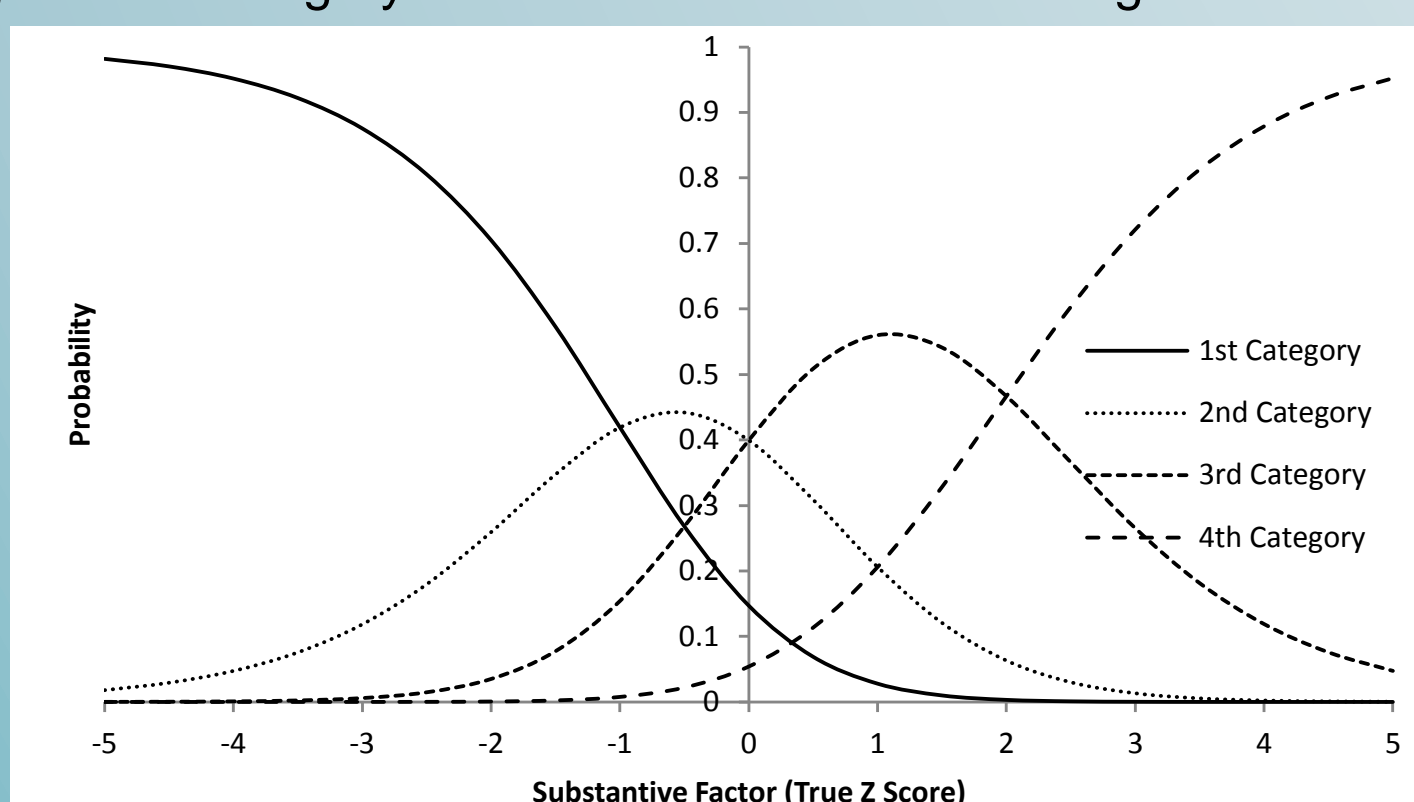
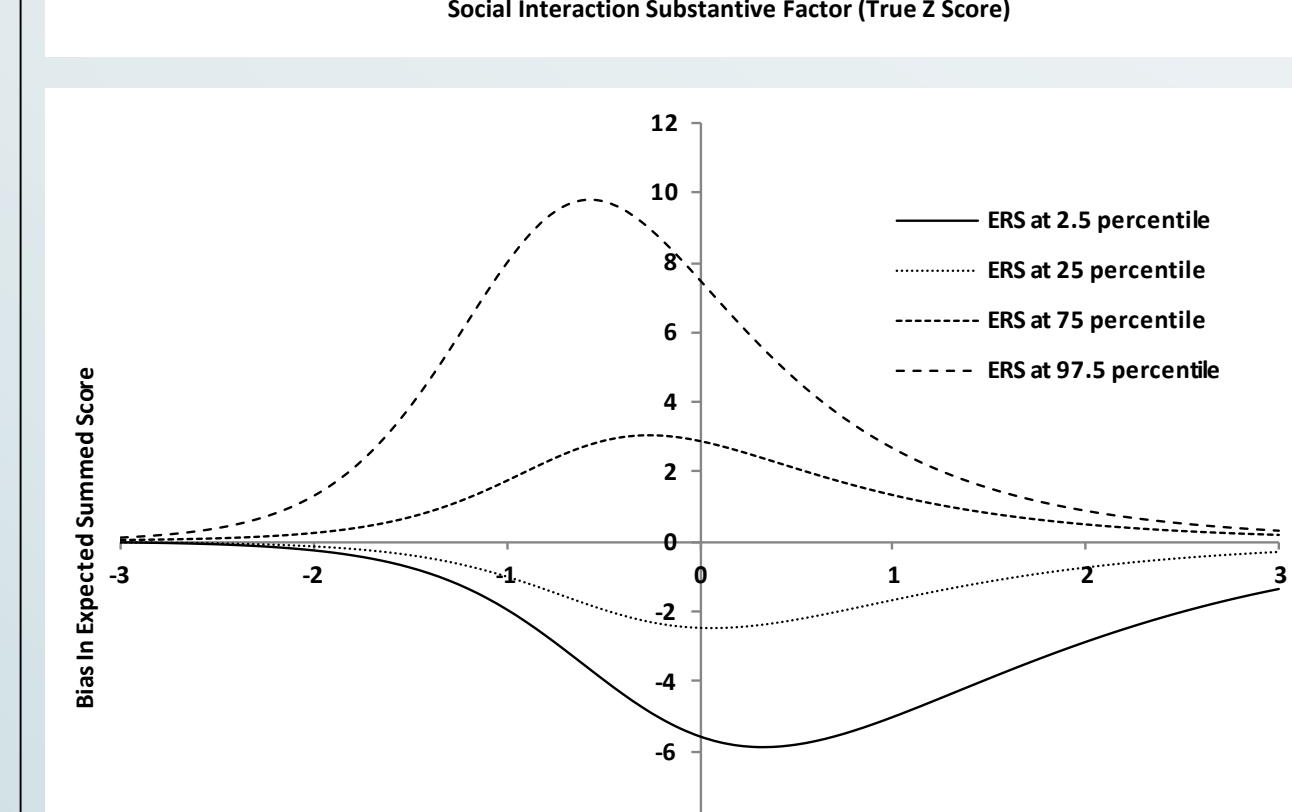
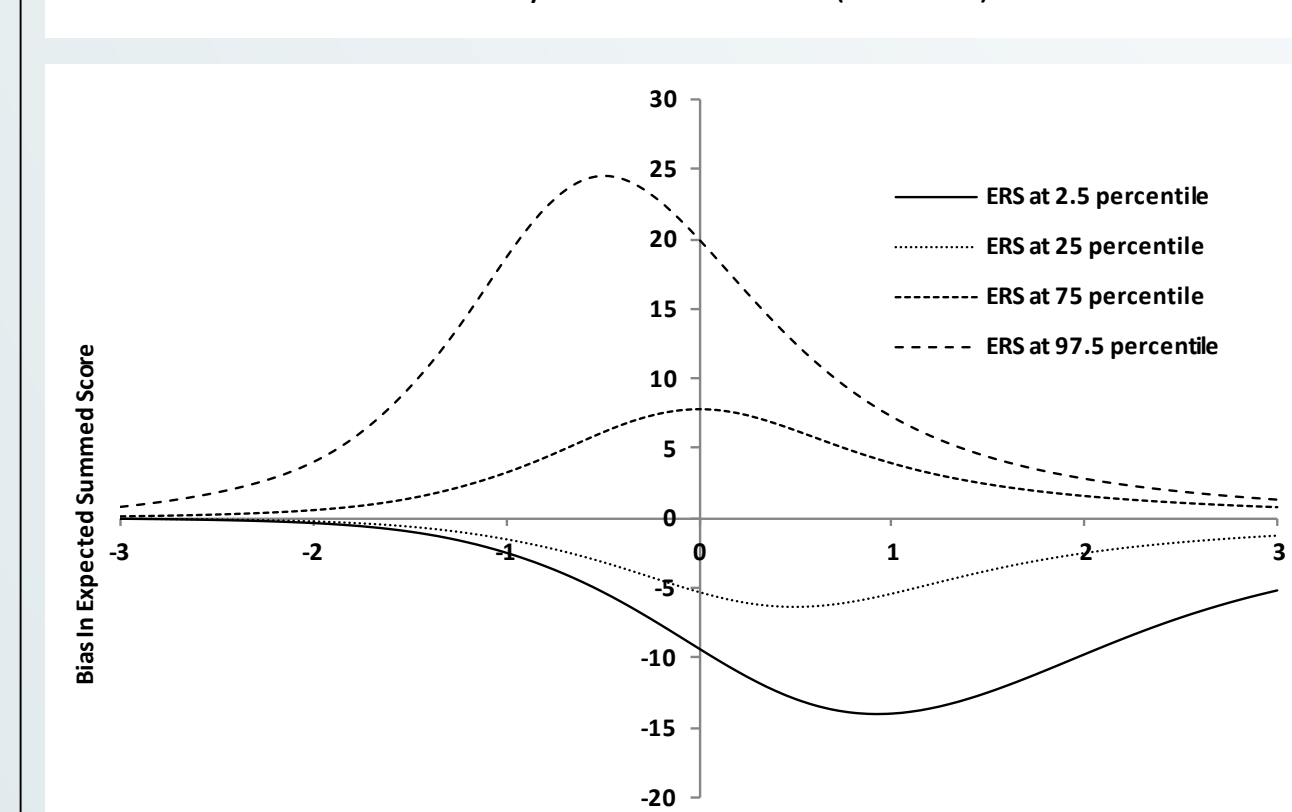
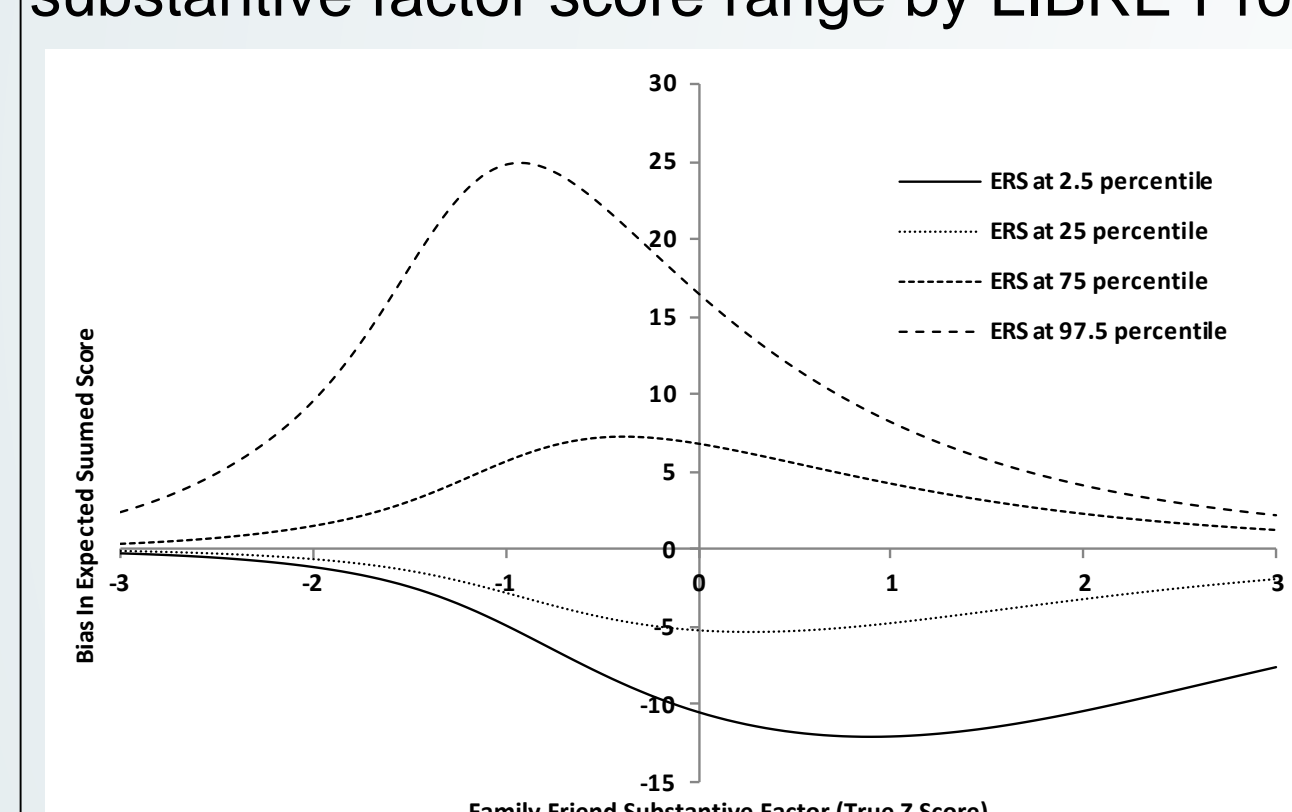


Figure 1.3 Category Characteristic Curves with negative HERS bias ($\theta_{HERS}=-1$)



Takeaway: 1.1) Without ERS, for each response category, there is a z score for which that category has the highest chance of being selected. 1.2) With positive high ERS, the 4th (extreme positive) category has the greatest chance of being selected for a wide range of z scores. 1.3) With negative high ERS, the 3rd (non-extreme positive) category has the greatest chance of being selected for a wide range of z scores.

Figure 2. Expected summed score bias at different HERS levels across the substantive factor score range by LIBRE Profile Scale



Calculated using the Multidimensional Generalized Partial Credit Model

Takeaway: For participants with a high true ability and positive high ERS, the bias has a small effect (increases their score a little). For participants with a low true ability and positive high ERS, the bias has a large effect (increases their score a lot), which could potentially mask a low true score. If someone has positive high ERS, it could be difficult to detect their true needs.