

Psychometric evaluation of a new measure of fear avoidance behavior after mild traumatic brain injury using Rasch Analysis



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Introduction

- Fear avoidance may be associated with poor recovery after mild traumatic brain injury (MTBI).
- A psychometrically valid measure of fear avoidance behavior after MTBI could help advance the field.

Purpose

- The Fear Avoidance Behavior in Traumatic Brain Injury questionnaire (FAB-TBI) has 16 items with Likert scale response options.
- The FAB-TBI was developed by factor analyses of existing fear avoidance measures from the chronic pain literature.
- The current study aimed to improve precision and item functioning of the FAB-TBI using Rasch Analysis.

Participants and Methods

- Adults (n = 120) were recruited from outpatient clinics in Vancouver and Calgary at 6.0 (IQR 4-8) weeks post-injury.
- Using Classical Test Theory methods we examined item-total correlations, Cronbach's alpha and dimensionality.
- Rasch Analysis using RUMM2030 software determined:
 - Differential item functioning (DIF)
 - Local independence
 - Unidimensionality
 - Person-item separation (PSI)

Results

- The sample was 39 (+/-12.5) years old. 61% were female and 68% were Caucasian. Motor vehicle accidents were most common (39%).
- Classical Test Theory:
 - Cronbach's alpha = 0.9
 - FAB-TBI item-total correlations all >0.3
 - Four factors (activity avoidance, pain concern, headache avoidance, symptom avoidance)
- Rasch Analyses:
 - Best fit to the Rasch model achieved after locally dependent items were combined into four subtests based on the above factor structure
 - Chi-square = 3.4, df 8, p = 0.91
 - Person-item separation Index = 0.8
 - DIF was identified by site but no other demographic or clinical factors

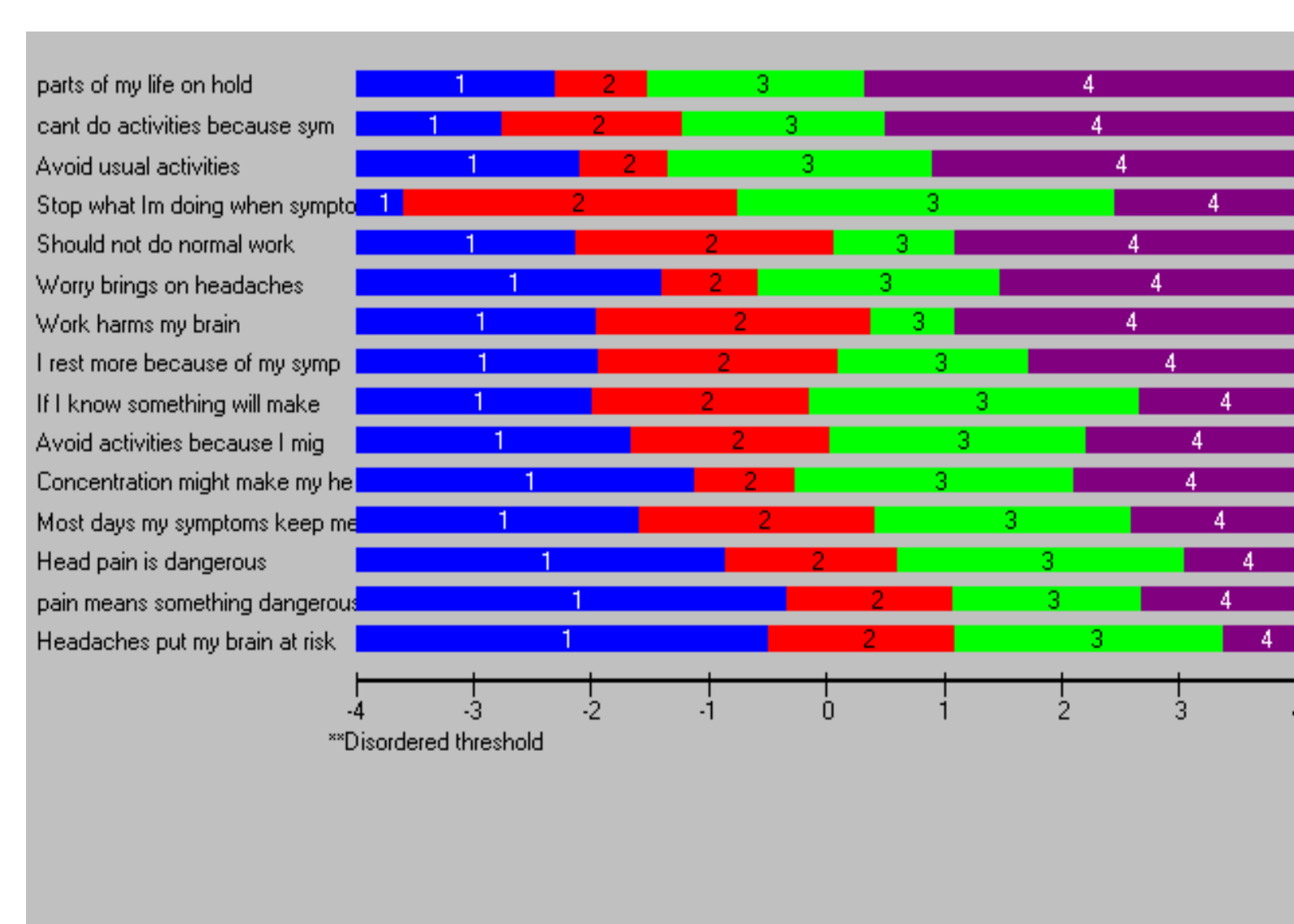


Fig 1: Item threshold map

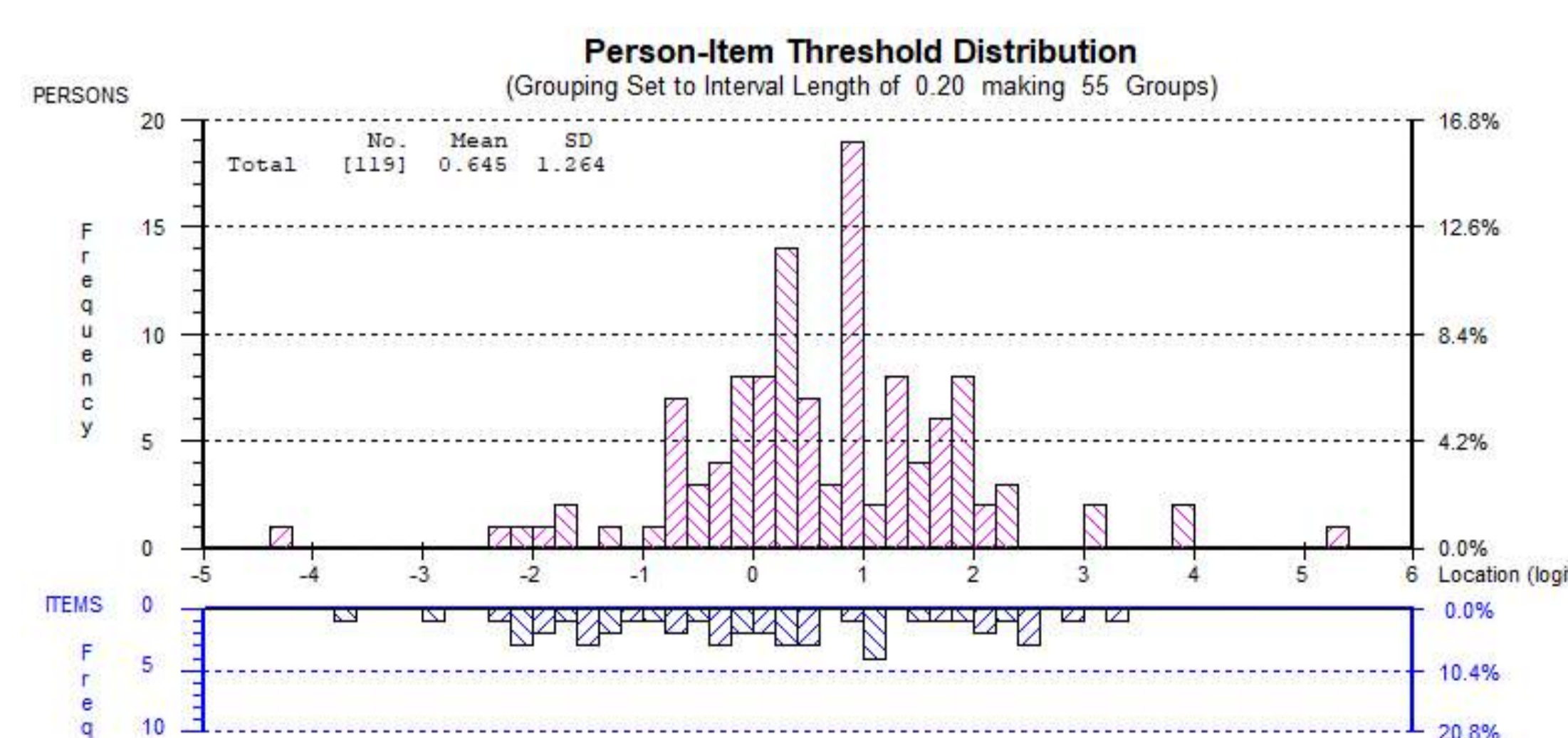


Fig 2: Person-Item Distribution

Conclusions

- With minor modifications, the FAB-TBI, a measure of fear avoidance behavior, demonstrated adequate properties as a unidimensional scale in these preliminary analyses.
- The results support retaining the original response format and content of the measure.