Cross-Cultural Validity of the SIP-2R for Indigenous and Black Adults Experiencing Homelessness with Alcohol Use Disorders

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BACKGROUND

- North American Indigenous (NAI) and Black adults experience a stark alcohol-related health disparities (Collins, 2016, HHS, 2019, Zapolski et al., 2014).
- NAI and Black adults report lower alcohol use than Whites, yet experience disproportionate alcohol-related problems (SAMHSA, 2018; SAMPSSA, 2019; HHS, 2018; Burwell et al., 2014; Wilson et al., 2014; Stave & Simon, 2015).
- NAI and Black adults are overrepresented among urban homeless people (Henry et al., 2019; Whitbeck et al., 2012).
- In Seattle, WA, Black adults make up 32% of the homeless population, but 6% of the general population, while NAI represent 10% of the homeless population, but <1% of the general population respectively (Home, 2019).
- The Short Inventory of Problems (SIP-2R) scale is a psychometrically reliable and valid scale used to assess alcohol-related problems (Miller et al., 1995).
- Marra et al. (2014) tested the factor structure and invariance of the SIP-2A among Hispanics using three competing SIP models: 1-factor, 5-factor, & Second order 5-factor (Marra et al., 2014).
- It is vital to test the psychometric properties of measures in order to minimize measurement bias when drawing conclusions across diverse groups.

AIMS OF THE PRESENT STUDY:

1. Investigate the factor structure of the SIP using three competing models for a community sample of NAI, Black, and White adults experiencing homelessness with alcohol use disorder (AUD).
2. Determine whether the SIP-2R demonstrates measurement invariance among the three groups: NAI, Black, and White adults experiencing homelessness with AUD.

METHODS

PARTICIPANTS

- 493 adults from baseline data of two larger RCTs of harm reduction treatment across six community-based settings:
  - 125 (25.3%) Indigenous
  - 205 (41.6%) Black
  - 163 (33.1%) White
  - 34 (6.9%) Latinx
  - Age: Median 49 years, SD = 9.04 (range: 21 – 71)
  - Sex: 20.1% Female, 79.9% male

PROCEDURE

- All research procedures were approved by University of Washington IRB (Collins et al., 2019; Collins et al., 2014).
- Inclusion criteria included being ≥21 years of age, experiencing homelessness for at least 6 of the last 12 months, meeting AUD criteria, among others (Collins et al., 2019; Collins et al., 2014).
- Participants provided written informed consent and engaged in a 45-minute baseline interview (Collins et al., 2019; Collins et al., 2014).

MEASURES

- Sociodemographic Questions
  - Single items were used to assess self-reported age, sex assigned at birth, race, ethnicity, and experiences of homelessness in the past year
  - The Short Inventory of Problems (SIP-2R) (Miller et al., 1995a)
    - 15-item, Likert-scale with four response options
    - (0 = never, 3 = daily or almost daily)

RESULTS

Table 1. Model identification

<table>
<thead>
<tr>
<th>Model</th>
<th>χ², p</th>
<th>df</th>
<th>CFI</th>
<th>RMSEA [90% CI]</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Factor</td>
<td>646.116, p &lt; .001</td>
<td>90</td>
<td>0.930</td>
<td>.112 (.104, .121)</td>
<td>0.066</td>
</tr>
<tr>
<td>First-Order 5-Factor</td>
<td>306.62, p &lt; .001</td>
<td>80</td>
<td>0.971</td>
<td>.076 (.067, .085)</td>
<td>0.045</td>
</tr>
<tr>
<td>Second-Order 5-Factor</td>
<td>320.30, p &lt; .001</td>
<td>85</td>
<td>0.970</td>
<td>.075 (.067, .084)</td>
<td>0.048</td>
</tr>
</tbody>
</table>

Table 2. Second-order 5-factor categorical confirmatory factor analysis by sample

<table>
<thead>
<tr>
<th>Group</th>
<th>χ², p</th>
<th>df</th>
<th>CFI</th>
<th>RMSEA [90% CI]</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous</td>
<td>145.328, p &lt; .001</td>
<td>85</td>
<td>0.973</td>
<td>.076 (.054, .096)</td>
<td>0.064</td>
</tr>
<tr>
<td>Black</td>
<td>201.981, p &lt; .001</td>
<td>85</td>
<td>0.971</td>
<td>.083 (.068, .097)</td>
<td>0.058</td>
</tr>
<tr>
<td>White</td>
<td>147.204, p &lt; .001</td>
<td>85</td>
<td>0.973</td>
<td>.067 (.049, .085)</td>
<td>0.067</td>
</tr>
</tbody>
</table>

Table 3. Multiple group confirmatory factor analysis for second-order 5-factor model

<table>
<thead>
<tr>
<th>Model</th>
<th>χ², p</th>
<th>df</th>
<th>CFI</th>
<th>RMSEA [90% CI]</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configural</td>
<td>493.482, p &lt; .001</td>
<td>255</td>
<td>0.972</td>
<td>.076 (.066, .086)</td>
<td>0.063</td>
</tr>
<tr>
<td>Metric</td>
<td>507.199, p &lt; .001</td>
<td>283</td>
<td>0.974</td>
<td>.070 (.060, .080)</td>
<td>0.076</td>
</tr>
<tr>
<td>Scalar</td>
<td>646.872, p &lt; .001</td>
<td>327</td>
<td>0.963</td>
<td>.077 (.068, .086)</td>
<td>0.063</td>
</tr>
<tr>
<td>Partial Scalar</td>
<td>623.758, p &lt; .001</td>
<td>355</td>
<td>0.966</td>
<td>.074 (.066, .083)</td>
<td>0.063</td>
</tr>
</tbody>
</table>

Table 4. Reliability per factor by race

<table>
<thead>
<tr>
<th>Group</th>
<th>Co-efficient Alpha (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous</td>
<td>0.92</td>
</tr>
<tr>
<td>Black</td>
<td>0.93</td>
</tr>
<tr>
<td>White</td>
<td>0.91</td>
</tr>
</tbody>
</table>

DISCUSSION

This work was supported by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) (R01AA022309 and R34AA02077) awarded to Susan E. Collins

RESULTS

Convergent Factor Analysis

- Results indicated that the second-order 5-factor model was the best-fitting model (Table 1)
  - This indicates that each latent factor (5) loads onto 1 general factor (second-order)
  - Adequate fit was found for all three racial groups (Table 2)

Measurement Invariance Across Groups

- Results indicated the scale as partially invariant across race (Table 3)
- Forward partial invariance testing looking at modification indices was conducted to determine which item thresholds (cutoffs for each response category) to relax across groups
- SIP3 threshold 1, was not invariant across groups (i.e. there was a significant difference in responses across groups from “Never” to “Once and a few times”)
  - SIP 3: “I have failed to do what is expected of me because of my drinking”
  - Threshold 1: From “Never” to “Once and a few times”

Reliability

- The scale had excellent internal consistency for all three racial groups (see Table 4)

Concurrent Validity

- Support for concurrent validity was found among the full sample with positive correlations between the total SIP-2R score and the number of drinks consumed in the past 7 days r (491) = .18, p < .05, and the number of drinks consumed on a heavy drinking day, r (489) = .28, p < .05

Given our sample is a heavily impacted group of individuals experiencing severe and disproportionately high alcohol-related problems, a second-order 5-factor model provides clinical utility by offering more clarity around specific groups of problems experienced by this population.

Partial invariance was established on item 3, indicating that there is a significance difference in responses to this item. However, given that over ½ of the items were invariant, it can be concluded the SIP-2R may be used to compare across these groups (Putnick & Borstein, 2016)

Limitations include that this study was comprised of a population of high utilizing underserved, urban adults experiencing homelessness with AUD; Therefore, results may not be generalizable to a less severe utilizing sample

Future directions should include further investigation into how this scale aligns psychometrically with harm reduction treatment