

Investigating language bias in the English version of the South African Substance Use Contextual Risk Instrument

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P5.5.03



Introduction

Adolescents in South Africa are susceptible to substance use due to the ease of access to and constant use of drugs by their peers. Various factors have been identified as possible contributors to the onset of adolescents substance use. The South African Substance Use Contextual Risk Instrument (SASUCRI) was developed for the purpose of identifying factors leading to adolescent substance use. Through the identification of these factors, appropriate preventative interventions can be informed. Early intervention is important because of the highly addictive nature of the drugs being used by these adolescents. The theoretical framework that guided the study was that of Bias and Equivalence.

Objectives

The purpose of this study was to assess the scalar equivalence of the English version of the SASUCRI across the English and isiXhosa mother tongue speakers. The study aimed to explore the language bias across the first and second language English speaking samples.

Methods

The study employed a differential research design. The total sample was 674 consisting of 420 English and 247 isiXhosa language speakers from low socio-economic status communities in Cape Town, South Africa. The study employed several techniques including the Hotelling's T square test to assess significant differences of means between the groups. The equality of reliabilities to assess the significance of differences between the scale reliabilities. The Tucker's Phi coefficient of congruence to assess the congruence of the construct across the two groups. Logistic regression to detect item bias in the scales found to be inequivalent across the two language groups.

Results

Using the three techniques several of the scales were found to be inequivalent across the two language groups. In assessing the mean differences, the results revealed that there were significant mean differences, with the isiXhosa-speaking group performing significantly lower than the English-speaking group for most of the scales. Internal consistency was also generally lower for the isiXhosa group. The structural congruence revealed that there was incongruence at some level between the two language groups for most of the scales with an exception of two of the twenty one scales as indicated in the tables below.

Individual systems level			
Name of scale	Mean dif	Reliability	Tucker's Phi
Social Identity	Sig	Not Sig	Not Equiv
Sense of bel.	Sig	Not Sig	Not Equiv
Self-efficacy	Sig	Not Sig	Not Equiv
Effect of drugs	Sig	Not Sig	Not Equiv
Religiosity	Sig	Not Sig	Not Equiv

Micro (family) systems level			
Name of scale	Mean dif	Reliability	Tuckers's Phi
Family functioning	Not Sig	Not Sig	Not Equiv
Comm. and support	Sig	Not Sig	Not Equiv
Parent monitoring	Sig	Not Sig	Equiv
Economic pressure	Sig	Not Sig	Equiv

Micro (community) systems level			
Name of scale	Mean dif	Reliability	Tucker's Phi
Peer support	Sig	Not Sig	Equiv
Peer influence	Sig	Not Sig	Equiv
School as a support	Sig	Not Sig	Equiv
School as a stressor	Sig	Not Sig	Not Equiv
Neighborhood	Sig	Not Sig	Equiv

Meso systems level			
Name of scale	Mean dif	Reliability	Tucker's Phi
Contradictions	Sig	Not Sig	Not Equiv
Mixed messages	Sig	Not Sig	Not Equiv

Macro systems level			
Name of scale	Mean dif	Reliability	Tucker's Phi
Tolerance for adol. use	Not Sig	Not Sig	Equiv
Tolerance for soft drugs	Sig	Not Sig	Equiv

Chrono systems level			
Name of scale	Mean dif	Reliability	Tuckers Phi
Hopeless individual	Not Sig	Sig	Not Equiv
Hopeless community	Not Sig	Not Sig	Not Equiv
Hope for future	Not Sig	Sig	Equiv

Results Continued

The study found that certain items of the English version of the instrument were biased against the second language speakers. The statistically significant result ($p < 0.01$) in the change in the chi-square from model 1 to model 3 shows that 14 items were identified as presenting with DIF as indicated in the tables below. The 14 items identified showed effect sizes that were between negligible and moderate, with only 4 items 10, 27, 45 and 92 showing a moderate effect size.

Social Identity				
Item	x^2	DIF	R^2	Effect size
1	6.483	No	0.008	Negligible
2	3.844	No	0.004	Negligible
3	0.303	No	0.001	Negligible
4	1.777	No	0.002	Negligible
5	1.772	No	0.002	Negligible
6	9.296	Yes	0.012	Negligible
7	3.641	No	0.004	Negligible
8	2.309	No	0.003	Negligible
9	3.058	No	0.004	Negligible

Sense of belonging				
Item	x^2	DIF	R^2	Effect size
10	28.713	Yes	0.041	Moderate
11	6.089	No	0.006	Negligible
12	8.552	No	0.008	Negligible
13	0.582	No	0	No effect
14	5.495	No	0.008	Negligible
15	2.42	No	0.003	Negligible
16	1.398	No	0.002	Negligible
17	20.24	Yes	0.018	Negligible
18	2.427	No	0.003	Negligible
19	0.847	No	0	No effect
20	0.799	No	0.001	Negligible
21	7.778	No	0.008	Negligible

Self-efficacy				
Item	x^2	DIF	R^2	Effect size
22	5.867	No	0.007	Negligible
23	0.223	No	0	Negligible
24	5.687	No	0.006	Negligible
25	0.553	No	0.001	Negligible
26	4.613	No	0.006	Negligible
27	35.682	Yes	0.044	Moderate
28	15.826	Yes	0.015	Negligible
29	0.465	No	0.001	Negligible
30	9.266	Yes	0.009	Negligible
31	16.825	Yes	0.021	Negligible
32	10.055	Yes	0.012	Negligible

Effect of drugs				
Item	x^2	DIF	R^2	Effect size
33	8.43	No	0.008	Negligible
34	8.468	No	0.002	Negligible
35	2.911	No	0.001	Negligible
36	0.308	No	0	No effect
37	3.644	No	0.001	Negligible
38	0.152	No	0	No effect

Religiosity				
Item	x^2	DIF	R^2	Effect size
39	1.226	No	0.001	Negligible
40	1.023	No	0.001	Negligible
41	0.796	No	0.004	Negligible
42	0.55	No	0.001	Negligible
43	0.125	No	0	No effect

Family functioning				
Item	x^2	DIF	R^2	Effect size
44	0.157	No	0	No effect
45	38.753	Yes	0.045	Moderate
46	1.176	No	0.001	Negligible
47	4.618	No	0.004	Negligible
48	0.875	No	0	No effect
49	14.499	Yes	0.011	Negligible
50	8.61	No	0.007	Negligible

Communication and social support				
Item	x^2	DIF	R^2	Effect size
56	2.739	No	0.003	Negligible
57	3.246	No	0.004	Negligible
58	1.285	No	0.001	Negligible
59	1.877	No	0.002	Negligible
60	5.902	No	0.004	Negligible
61	2.084	No	0.001	Negligible
62	0.521	No	0.001	Negligible
63	5.753	No	0.006	Negligible

School as a stressor				
Item	x^2	DIF	R^2	Effect size
90	3.333	No	0.003	Negligible
91	8.455	No	0.008	Negligible
92	38.183	Yes	0.035	Moderate
93	7.6	No	0.007	Negligible
94	7.178	No	0.008	Negligible
95	9.83	Yes	0.001	Negligible

Contradictions				
Item	x^2	DIF	R^2	Effect size
102	2.165	No	0	No effect
103	2.409	No	0.001	Negligible

Mixed messages				
Item	x^2	DIF	R^2	Effect size
104	0.885	No	0.001	Negligible
105	8.462	No	0.005	Negligible
106	30.596	Yes	0.030	Negligible
107	4.81	No	0.005	Negligible
108	3.55	No	0.003	Negligible
109	1.58	No	0.001	Negligible
110	0.589	No	0	No effect

Hopeless Individual				
Item	x^2	DIF	R^2	Effect size
119	5.957	No	0.005	Negligible
120	4.529	No	0.004	Negligible
121	4.57	No	0.004	Negligible

Hopeless community				
Item	x^2	DIF	R^2	Effect size
122	0.104	No	0	No effect
123	13.436	Yes	0.011	Negligible
124	0.51	No	0	No effect
125	2.953	No	0.002	Negligible

Conclusion and recommendations

It can thus be concluded that the measure cannot be accepted as structurally equivalent across the two groups. It is clear that bias exists in the majority of the scales of the SASUCRI and that this version is thus not applicable for an isiXhosa speaking sample. The study recommends that the instrument be adapted for this group in order to accurately assess the risk factors. Tailored interventions can then be developed for the different groups based on the information yielded by the different versions of the instrument.



The financial assistance of the NRF towards the research is hereby acknowledged