S2 File

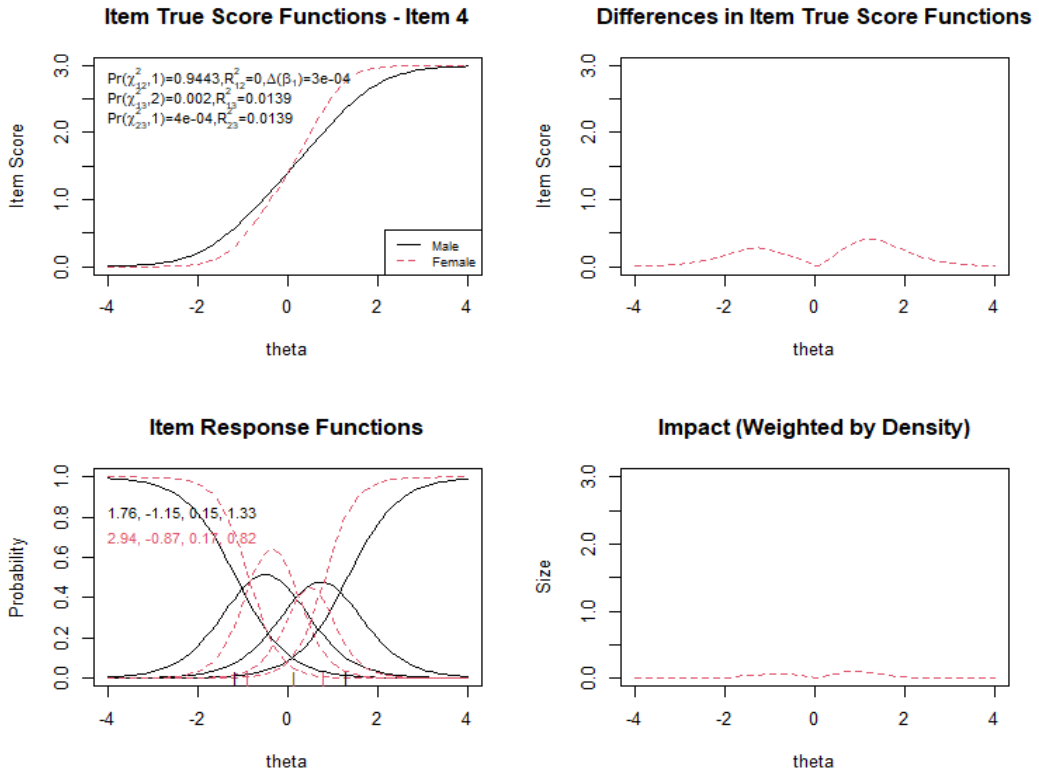
Differential item functioning (DIF) – sex

As can be seen from Table 1, item 4 was flagged for DIF. However, the McFadden pseudo-R^2 indices suggested that the DIF effect was negligible. Additionally, the change in beta parameter for model 1 and model 2 was well below 5% in all instances. Figure 1 shows the plots for item 4 and, as can be seen from the figure (bottom-right), the impact is negligible.

Table 1. DIF test based on participants' sex

Item #	M1 vs M2	M1 vs M3	M2 vs M3	R^2 (M1, M2)	R^2 (M1, M3)	R^2 (M2, M3)	Δβ (M1, M2)
1	0.115	0.177	0.323	0.003	0.004	0.001	0.013
2	0.035	0.095	0.608	0.006	0.006	0.000	0.022
3	0.782	0.646	0.372	0.000	0.001	0.001	0.001
4	0.944	0.002	0.000	0.000	0.014	0.014	0.000
5	0.014	0.013	0.107	0.008	0.011	0.003	0.009
6	0.096	0.015	0.017	0.004	0.012	0.008	0.001
7	0.575	0.580	0.378	0.000	0.001	0.001	0.001
8	0.666	0.649	0.410	0.000	0.001	0.001	0.001
9	0.041	0.084	0.372	0.009	0.011	0.002	0.021

Notes. M = model number chi-square test; statistical significance < 0.01; R^2 = McFadden pseudo-R^2; Δβ = change in beta for model 1 and model 2.



Differential item functioning (DIF) – ethnicity

As can be seen from Table 2, no items were flagged for DIF. Specifically, there were no significant difference tests at the $p < 0.01$ level between models and all changes in beta parameters were well below 5%. Therefore, it was not possible to generate any meaningful plots to accompany the table.

Table 2. DIF test based on participants' ethnicity

Item #	M1 vs M2	M1 vs M3	M2 vs M3	R^2 (M1, M2)	R^2 (M1, M3)	R^2 (M2, M3)	Δβ (M1, M2)
1	0.244	0.438	0.622	0.003	0.005	0.001	0.011
2	0.262	0.494	0.699	0.004	0.004	0.001	0.013
3	0.533	0.611	0.489	0.002	0.003	0.002	0.002
4	0.558	0.165	0.070	0.001	0.008	0.006	0.006
5	0.371	0.557	0.600	0.003	0.004	0.001	0.003
6	0.845	0.199	0.059	0.001	0.009	0.008	0.002
7	0.723	0.572	0.322	0.001	0.004	0.003	0.001
8	0.868	0.865	0.608	0.000	0.002	0.002	0.002
9	0.181	0.133	0.162	0.011	0.022	0.012	0.018

Notes. M = model number chi-square test; statistical significance < 0.01; R^2 = McFadden pseudo-R^2; Δβ = change in beta for model 1 and model 2.

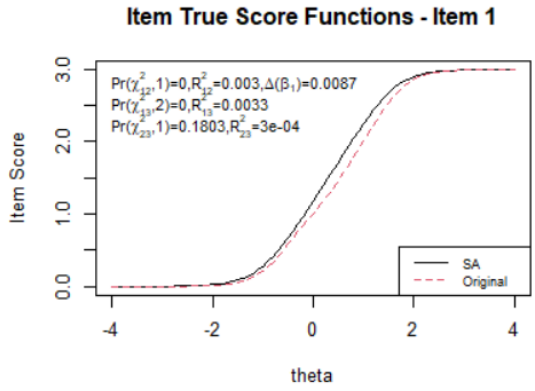
Differential item functioning (DIF) – sample

Table 3 shows that items 1, 3, 4, 8, and 9 were flagged for DIF. For items 1, 3, 4, and 8, the impacts were of negligible magnitude. Item 9's change in beta was 6.6% (i.e., above the 5% cut-off). However, given the intensity of the item, the item text itself, and the difference in sample sizes (327 versus 2254), the impact can be considered minor again.

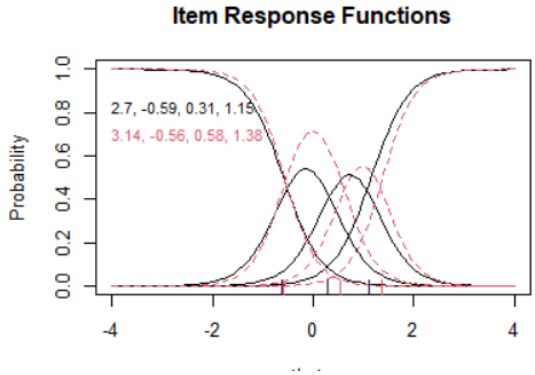
Table 3. DIF test for the ODI based on participants' sample

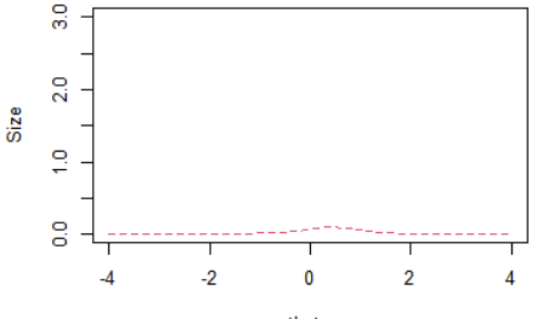
Item #	M1 vs M2	M1 vs M3	M2 vs M3	R^2 (M1, M2)	R^2 (M1, M3)	R^2 (M2, M3)	Δβ (M1, M2)
1	0.000	0.000	0.180	0.009	0.003	0.003	0.000
2	0.917	0.937	0.729	0.000	0.000	0.000	0.000
3	0.000	0.000	0.261	0.011	0.008	0.008	0.000
4	0.000	0.000	0.882	0.007	0.005	0.005	0.000
5	0.126	0.301	0.812	0.000	0.000	0.000	0.000
6	0.058	0.051	0.126	0.002	0.001	0.001	0.000
7	0.587	0.281	0.134	0.000	0.000	0.000	0.000
8	0.001	0.001	0.113	0.003	0.002	0.002	0.000
9	0.000	0.000	0.909	0.066	0.033	0.033	0.000

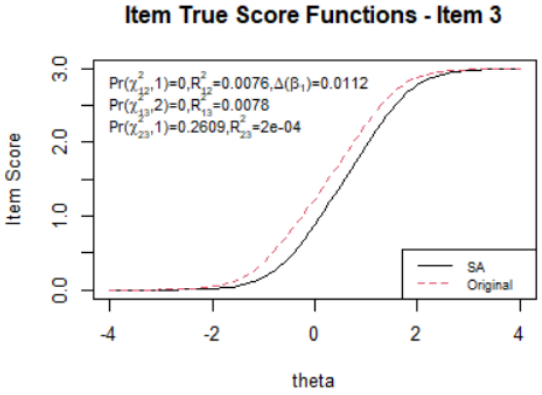
Notes. M = model number chi-square test; statistical significance < 0.01; R^2 = McFadden pseudo-R^2; Δβ = change in beta for model 1 and model 2.

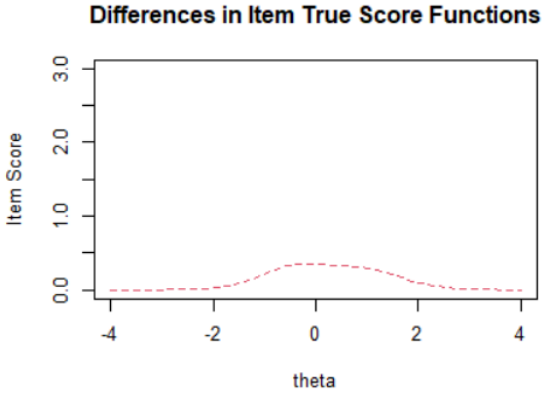

Item True Score Functions - Item 1
Pr(χ²12,1)=0,R²12=0.003,Δ(β1)=0.0087
Pr(χ²13,2)=0,R²13=0.0033
Pr(χ²23,1)=0.1803,R²23=3e-04
SA
Original
Item Score
theta

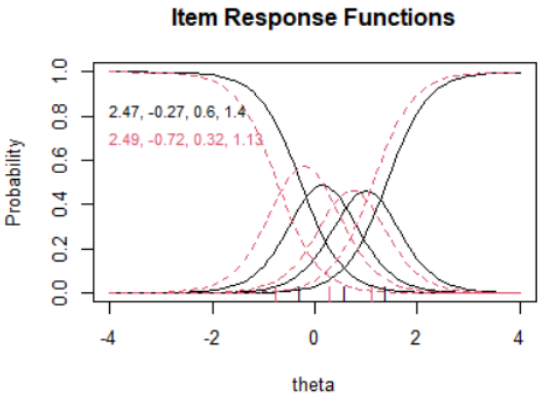
Differences in Item True Score Functions
Item Score
theta

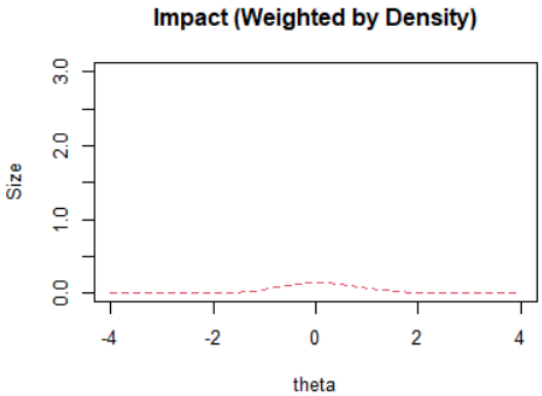

Item Response Functions
2.7, -0.59, 0.31, 1.15
3.14, -0.56, 0.58, 1.38
Probability

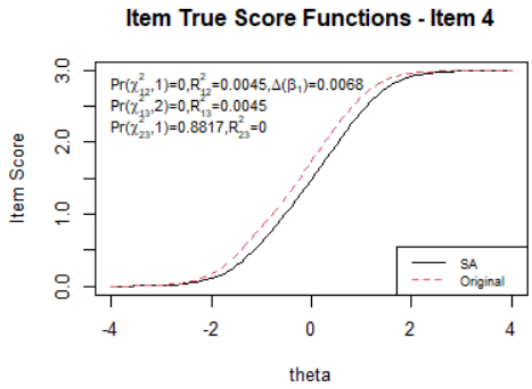

Impact (Weighted by Density)
Size

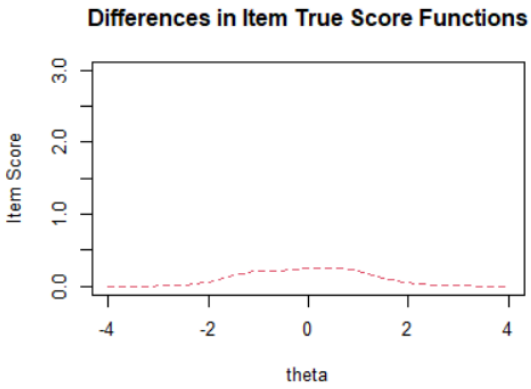

Item True Score Functions - Item 3
Pr(χ²12,1)=0,R²12=0.0076,Δ(β1)=0.0112
Pr(χ²13,2)=0,R²13=0.0078
Pr(χ²23,1)=0.2609,R²23=2e-04
SA
Original
Item Score
theta

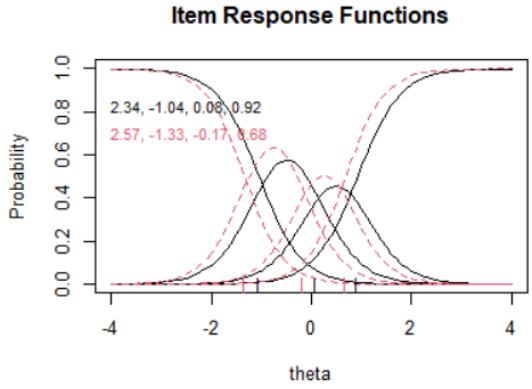

Differences in Item True Score Functions
Item Score
theta

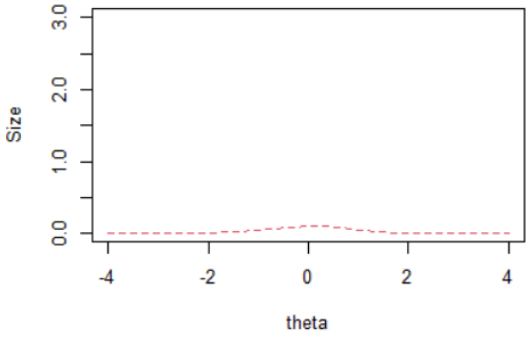

Item Response Functions
2.47, -0.27, 0.6, 1.4
2.49, -0.72, 0.32, 1.13
Probability

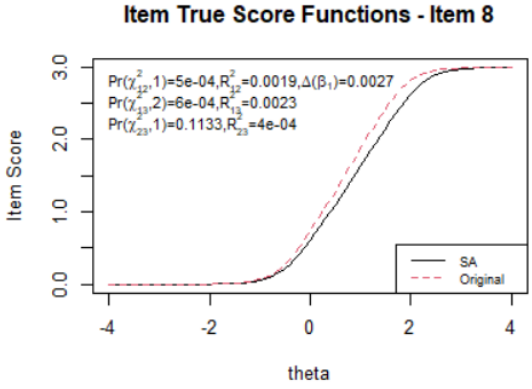

Impact (Weighted by Density)
Size

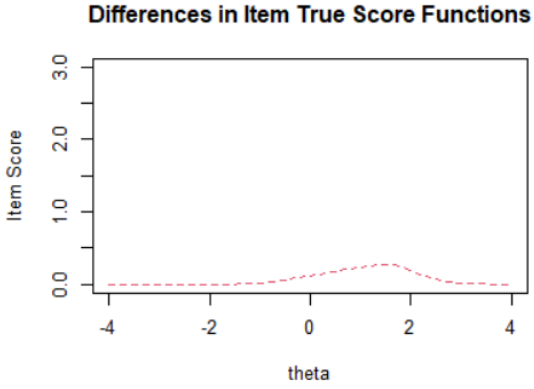

Item True Score Functions - Item 4
Item Score
theta
SA
Original

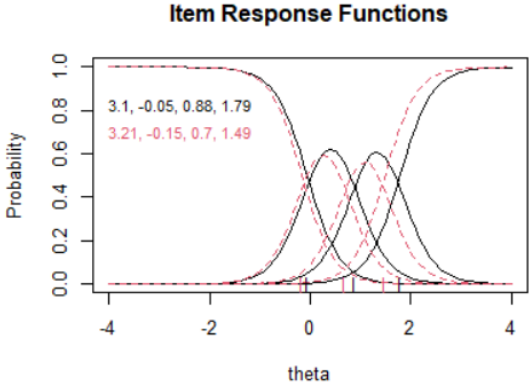

Differences in Item True Score Functions
Item Score
theta

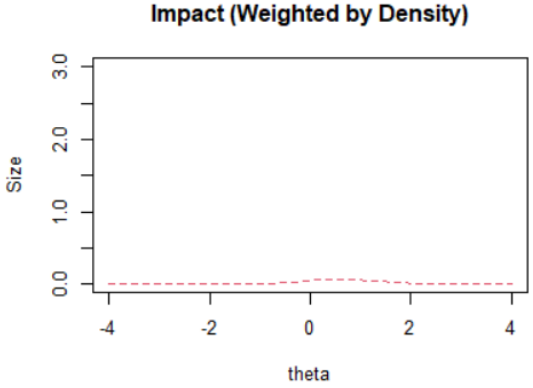

Item Response Functions
Probability
theta

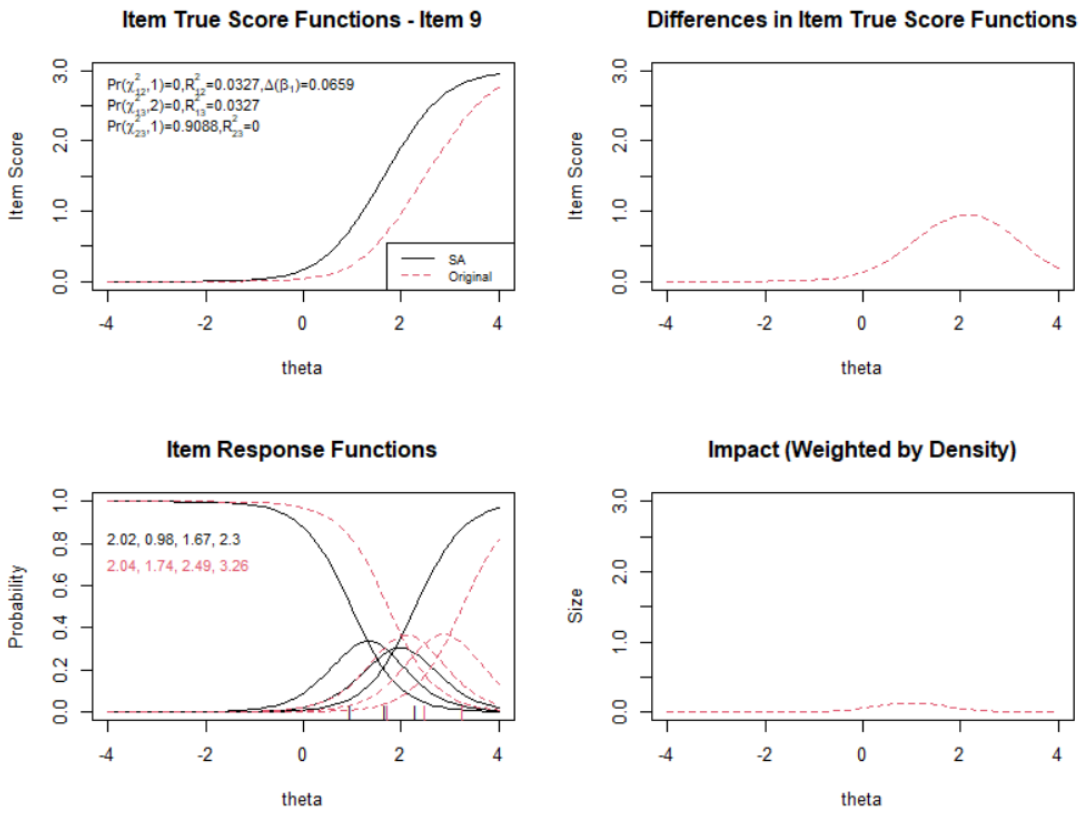

Impact (Weighted by Density)
Size
theta


Item True Score Functions - Item 8
Item Score
theta
SA
Original


Differences in Item True Score Functions
Item Score
theta


Item Response Functions
Probability
theta


Impact (Weighted by Density)
Size
theta



Differential item functioning (DIF) – age group

Only the first three age groups were viable for DIF testing due to group sizes. As can been seen from Table 4, no items were flagged for DIF. None of the model chi-square tests were significant and the changes in beta parameters were all well below 5%.

Table 4. DIF test based on participants' age group

Item #	M1 vs M2	M1 vs M3	M2 vs M3	R^2 (M1, M2)	R^2 (M1, M3)	R^2 (M2, M3)	Δβ (M1, M2)
1	0.131	0.183	0.341	0.010	0.005	0.008	0.003
2	0.866	0.509	0.222	0.000	0.000	0.005	0.004
3	0.488	0.491	0.372	0.006	0.002	0.005	0.003
4	0.840	0.661	0.357	0.005	0.001	0.003	0.003
5	0.648	0.875	0.840	0.001	0.001	0.002	0.001
6	0.279	0.612	0.935	0.011	0.004	0.004	0.000
7	0.422	0.152	0.083	0.005	0.003	0.010	0.008
8	0.421	0.736	0.872	0.018	0.003	0.004	0.001
9	0.599	0.185	0.075	0.018	0.004	0.022	0.018

Notes. M = model number chi-square test; statistical significance < 0.01; R^2 = McFadden pseudo-R^2; Δβ = change in beta for model 1 and model 2.