**Supporting Information**

**Table S1 |** Fundamental messages for five scales used in this research.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***Name of Scale*** | ***Main Author*** | ***Author (Chinese Version)*** | ***Quantity of***  ***Items (Original vs Chinese Version)*** | ***Scoring***  ***Method*** | ***Reliability (Original Version)*** | ***Reliability (Chinese Version)*** | ***Reliability in this research*** |
| *Eating Disorders Inventory-3*  *(EDI-3)* | David M. Garner (2004) | Leung, et al. | 91 vs 91 | 6-point response format: 0, 0, 1, 2, 3, 4 | Cronbach α is between 0.84 and 0.92 for each sub-scale | Cronbach α = 0.95 | Cronbach α = 0.963 |
| *Eating Disorders Examination Questionnaire (EDE-Q)* | Fairburn & Beglin (1994) | Gu, L. et al. | 22 vs 22 | 7-point response format: 0, 1, 2, 3, 4, 5, 6 | Cronbach α = 0.9  (Peterson, et al., 2007) | Cronbach α = 0.95 | Cronbach α = 0.962 |
| *Eating Attitudes Test (EAT-26)* | Garner, Olmsted & Yvonne Bohr (1982) | Chen, B. et al. | 26 vs 19 | 6-point response format:1, 2, 3, 4, 5, 6 | Cronbach α = 0.9  (Garner, Olmsted, Bohr & Garfinkel, 1982) | Cronbach α = 0.88 | Cronbach α = 0.952 |
| *Eating Symptoms Checkilst-21*  *(ESC-21)* | Leung F. et al. (2003) | Huang, Y. | 21 vs 17 | 5-point and 4-point response format: 1, 2, 3, 4, 5 and 1, 2, 3, 4 | Not found | Cronbach α = 0.83 | Cronbach α = 0.936 |
| *The SCOFF questionnaire* | Morgan, Reid & Lacey (2000) | He, W. | 5 vs 5 | 2-point response format:1, 0 | Cronbach α was not mentioned. | Cronbach α = 0.751 | Cronbach α = 0.751 |

**Table S2 |** Test-level model-ﬁt for three polytomously-scored IRT models

|  |  |  |  |
| --- | --- | --- | --- |
| ***Model*** | ***-2LL*** | ***AIC*** | ***BIC*** |
| Graded response model (GRM) | 292336.5 | 293648.5 | 296884.2 |
| Generalized partial credit model (GPCM) | 294119.9 | 295431.9 | 298667.5 |
| Partial Credit Model (PCM) | 296160.7 | 297274.7 | 300022.1 |

Note: ***-2LL*** refers to -2log-likelihood. ***AIC*** refers to Akaike’s information criterion. ***BIC*** refers to Bayesian information criterion.

**TABLE S3 |** Item parameters of the ﬁnal item bank of CAT-ED with GRM.

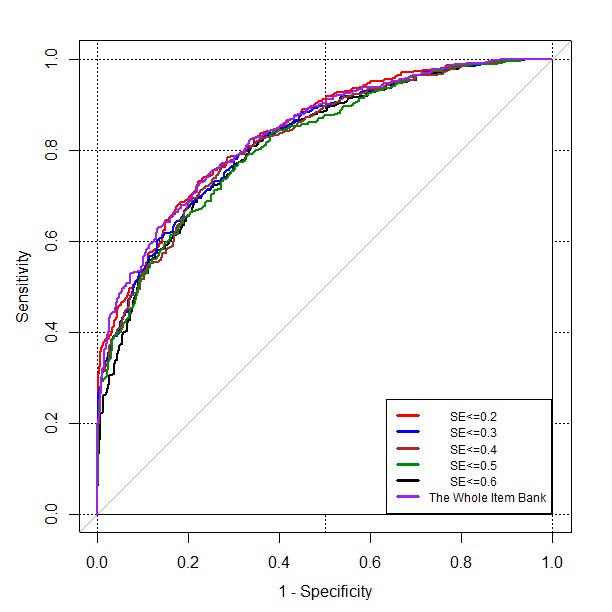
|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Item*** | ***M*±*SD*** | ***Item Parameters*** | | | | | | | ***Item Fit*** | | |
| ***a*** | ***b1*** | ***b2*** | ***b3*** | ***b4*** | ***b5*** | ***b6*** | ***S-χ2*** | ***df*** | ***p*** |
| **1** | 1.35±1.57 | 1.56 | -0.31 | 0.66 | 1.14 | 1.61 | 2.78 |  | 277.00 | 235 | 0.031 |
| **2** | 1.92±1.60 | 1.04 | -1.24 | -0.08 | 0.66 | 1.33 | 3.66 |  | 367.66 | 339 | 0.136 |
| **3** | 1.67±1.58 | 1.08 | -0.93 | 0.20 | 0.94 | 1.61 | 3.51 |  | 334.48 | 323 | 0.318 |
| **4** | 1.68±1.32 | 1.20 | -1.53 | 0.13 | 1.07 | 1.80 | 4.97 |  | 258.36 | 282 | 0.840 |
| **5** | 1.55±1.57 | 0.85 | -0.99 | 0.60 | 1.39 | 1.99 | 3.82 |  | 356.78 | 324 | 0.102 |
| **6** | 1.52±1.63 | 1.50 | -0.42 | 0.47 | 1.01 | 1.58 | 2.55 |  | 278.44 | 260 | 0.206 |
| **7** | 1.47±1.49 | 1.29 | -0.68 | 0.47 | 1.05 | 1.87 | 3.37 |  | 288.44 | 269 | 0.198 |
| **8** | 2.29±1.59 | 0.95 | -1.81 | -0.63 | 0.18 | 0.82 | 3.96 |  | 360.09 | 344 | 0.265 |
| **9** | 1.45±1.66 | 1.57 | -0.26 | 0.54 | 1.01 | 1.43 | 2.65 |  | 260.73 | 250 | 0.308 |
| **10** | 1.16±1.6 | 0.87 | 0.17 | 1.22 | 2.00 | 2.52 | 3.29 |  | 271.99 | 250 | 0.162 |
| **11** | 1.77±1.57 | 1.68 | -0.80 | 0.10 | 0.65 | 1.16 | 3.02 |  | 291.17 | 300 | 0.632 |
| **12** | 1.50±1.32 | 0.95 | -1.40 | 0.48 | 1.47 | 2.40 | 5.43 |  | 343.42 | 306 | 0.069 |
| **13** | 1.26±1.22 | 1.04 | -0.98 | 0.81 | 1.97 | 2.81 | 4.69 |  | 289.33 | 275 | 0.265 |
| **14** | 1.46±1.53 | 1.11 | -0.69 | 0.58 | 1.30 | 1.93 | 3.21 |  | 312.14 | 284 | 0.121 |
| **15** | 1.30±1.53 | 1.51 | -0.32 | 0.74 | 1.27 | 1.73 | 2.81 |  | 257.47 | 233 | 0.130 |
| **16** | 1.51±1.22 | 0.53 | -2.18 | 0.17 | 2.66 | 5.00 | 9.35 |  | 366.25 | 360 | 0.399 |
| **17** | 1.19±1.5 | 1.16 | -0.21 | 1.05 | 1.62 | 2.21 | 3.14 |  | 274.79 | 247 | 0.108 |
| **18** | 1.37±1.51 | 0.59 | -0.56 | 0.79 | 1.93 | 3.24 | 6.66 |  | 330.32 | 280 | 0.021 |
| **19** | 1.28±1.25 | 1.11 | -1.01 | 0.81 | 1.76 | 2.60 | 4.18 |  | 265.03 | 266 | 0.505 |
| **20** | 2.07±1.25 | 1.01 | -2.61 | -0.67 | 0.63 | 1.83 | 5.51 |  | 353.70 | 329 | 0.167 |
| **21** | 1.86±1.27 | 0.97 | -2.28 | -0.22 | 0.97 | 2.15 | 5.72 |  | 326.21 | 326 | 0.486 |
| **22** | 1.42±1.57 | 1.37 | -0.47 | 0.64 | 1.22 | 1.65 | 2.92 |  | 279.44 | 247 | 0.076 |
| **23** | 1.3±1.53 | 1.15 | -0.37 | 0.77 | 1.66 | 2.05 | 3.09 |  | 288.49 | 271 | 0.222 |
| **24** | 1.36±1.36 | 1.05 | -0.92 | 0.78 | 1.73 | 2.42 | 3.87 |  | 284.47 | 276 | 0.350 |
| **25** | 1.6±1.4 | 1.11 | -1.16 | 0.26 | 1.20 | 2.00 | 4.06 |  | 329.01 | 322 | 0.382 |
| **26** | 1.35±1.58 | 1.25 | -0.26 | 0.67 | 1.28 | 1.83 | 3.02 |  | 308.38 | 267 | 0.041 |
| **27** | 1.28±1.4 | 0.96 | -0.67 | 0.85 | 1.80 | 2.57 | 3.91 |  | 281.94 | 286 | 0.557 |
| **28** | 1.82±1.42 | 0.53 | -2.96 | -0.002 | 1.57 | 2.96 | 6.93 |  | 330.88 | 329 | 0.461 |
| **29** | 1.6±1.62 | 1.67 | -0.49 | 0.29 | 0.84 | 1.27 | 2.84 |  | 311.78 | 283 | 0.115 |
| **30** | 1.5±1.43 | 1.02 | -1.02 | 0.42 | 1.45 | 2.20 | 3.82 |  | 352.26 | 324 | 0.134 |
| **31** | 1.45±1.42 | 0.88 | -0.96 | 0.53 | 1.68 | 2.63 | 4.31 |  | 325.14 | 331 | 0.580 |
| **32** | 1.53±1.46 | 0.90 | -1.02 | 0.49 | 1.30 | 2.31 | 4.49 |  | 335.64 | 309 | 0.143 |
| **33** | 1.43±1.43 | 1.18 | -0.81 | 0.57 | 1.32 | 2.06 | 3.66 |  | 322.34 | 277 | 0.032 |
| **34** | 1.7±1.71 | 0.91 | -0.72 | 0.31 | 1.06 | 1.69 | 3.08 |  | 357.64 | 326 | 0.110 |
| **35** | 1.98±1.33 | 0.82 | -2.50 | -0.45 | 0.86 | 2.05 | 6.13 |  | 341.46 | 356 | 0.701 |
| **36** | 1.85±1.29 | 0.61 | -2.88 | -0.50 | 1.48 | 3.25 | 7.45 |  | 372.02 | 364 | 0.375 |
| **37** | 1.31±1.47 | 0.90 | -0.56 | 0.91 | 1.71 | 2.44 | 4.16 |  | 295.87 | 296 | 0.491 |
| **38** | 1.17±1.38 | 0.90 | -0.48 | 1.15 | 2.09 | 2.88 | 4.18 |  | 281.35 | 277 | 0.416 |
| **39** | 1.5±1.42 | 0.98 | -0.97 | 0.43 | 1.30 | 2.31 | 4.49 |  | 366.47 | 319 | 0.034 |
| **40** | 1.25±1.26 | 0.93 | -1.04 | 1.02 | 2.08 | 2.88 | 4.74 |  | 281.25 | 267 | 0.263 |
| **41** | 1±1.33 | 0.67 | -0.17 | 1.97 | 3.15 | 4.05 | 4.98 |  | 236.08 | 266 | 0.907 |
| **42** | 0.95±1.49 | 0.93 | 0.26 | 1.78 | 2.39 | 2.65 | 3.10 |  | 223.91 | 222 | 0.451 |
| **43** | 1.62±1.39 | 1.04 | -1.21 | 0.14 | 1.24 | 2.10 | 4.42 |  | 373.68 | 343 | 0.122 |
| **44** | 1.05±1.64 | 0.94 | 0.50 | 1.47 | 2.08 | 2.43 | 2.80 |  | 216.67 | 220 | 0.551 |
| **45** | 0.91±1.13 | 0.78 | -0.39 | 1.95 | 3.28 | 4.09 | 5.48 |  | 280.47 | 238 | 0.031 |
| **46** | 1.08±1.25 | 0.97 | -0.51 | 1.26 | 2.29 | 3.05 | 4.54 |  | 216.54 | 252 | 0.948 |
| **47** | 1.47±1.27 | 1.05 | -1.52 | 0.64 | 1.57 | 2.33 | 4.69 |  | 256.29 | 262 | 0.588 |
| **48** | 2.13±1.34 | 0.81 | -2.68 | -0.81 | 0.56 | 1.73 | 7.68 |  | 385.89 | 364 | 0.206 |
| **49** | 1.46±1.3 | 0.97 | -1.36 | 0.53 | 1.58 | 2.56 | 4.88 |  | 293.63 | 301 | 0.609 |
| **50** | 1.56±1.37 | 1.62 | -1.07 | 0.13 | 1.27 | 1.80 | 2.32 |  | 253.17 | 249 | 0.415 |
| **51** | 1.26±1.64 | 2.36 | -0.12 | 0.51 | 1.04 | 1.31 | 1.66 |  | 230.04 | 193 | 0.035 |
| **52** | 2.46±1.75 | 1.81 | -1.28 | -0.60 | 0.11 | 0.63 | 1.12 |  | 314.98 | 328 | 0.688 |
| **53** | 2.16±1.72 | 1.87 | -1.10 | -0.35 | 0.40 | 0.86 | 1.34 |  | 338.04 | 304 | 0.087 |
| **54** | 1.33±1.45 | 1.66 | -0.46 | 0.44 | 1.22 | 1.83 | 2.38 |  | 248.27 | 251 | 0.537 |
| **55** | 0.92±1.39 | 1.62 | 0.21 | 0.96 | 1.65 | 2.08 | 2.54 |  | 210.92 | 211 | 0.489 |
| **56** | 1.45±1.56 | 2.33 | -0.46 | 0.26 | 0.98 | 1.33 | 1.82 |  | 268.05 | 224 | 0.023 |
| **57** | 0.71±1.34 | 1.35 | 0.67 | 1.55 | 2.07 | 2.60 | 2.95 | 3.20 | 173.67 | 154 | 0.133 |
| **58** | 1.36±1.8 | 1.62 | -0.22 | 0.70 | 1.15 | 1.51 | 1.87 | 2.12 | 252.38 | 230 | 0.149 |
| **59** | 1.26±1.99 | 2.70 | 0.18 | 0.68 | 0.93 | 1.20 | 1.36 | 1.49 | 200.61 | 172 | 0.067 |
| **60** | 1.3±1.98 | 2.93 | 0.12 | 0.62 | 0.88 | 1.18 | 1.38 | 1.53 | 189.98 | 165 | 0.089 |
| **61** | 1.87±2.13 | 2.41 | -0.47 | 0.25 | 0.61 | 0.90 | 1.14 | 1.33 | 266.38 | 224 | 0.027 |
| **62** | 1.27±1.85 | 2.41 | 0.02 | 0.64 | 0.97 | 1.30 | 1.60 | 1.82 | 203.06 | 185 | 0.173 |
| **63** | 0.94±1.69 | 1.61 | 0.45 | 1.22 | 1.59 | 1.86 | 2.11 | 2.39 | 187.67 | 178 | 0.295 |
| **64** | 1.46±1.99 | 2.49 | -0.18 | 0.61 | 0.88 | 1.15 | 1.32 | 1.66 | 218.86 | 182 | 0.032 |
| **65** | 1.21±1.8 | 1.95 | 0.15 | 0.61 | 1.08 | 1.39 | 1.87 | 2.18 | 231.90 | 202 | 0.073 |
| **66** | 2±1.94 | 1.96 | -0.67 | -0.20 | 0.57 | 0.93 | 1.45 | 1.80 | 324.24 | 269 | 0.012 |
| **67** | 1.81±2.01 | 1.29 | -0.40 | 0.03 | 0.78 | 1.24 | 1.84 | 2.19 | 250.93 | 238 | 0.270 |
| **68** | 2.05±1.89 | 1.62 | -0.85 | 0.22 | 0.51 | 1.03 | 1.63 | 2.10 | 333.99 | 315 | 0.221 |
| **69** | 0.36±0.96 | 1.81 | 1.38 | 1.75 | 2.11 | 2.47 |  |  | 109.15 | 83 | 0.029 |
| **70** | 0.86±1.22 | 2.07 | 0.10 | 0.97 | 1.51 | 1.95 |  |  | 223.94 | 181 | 0.016 |
| **71** | 1.27±1.03 | 2.25 | -0.76 | 0.28 | 1.27 |  |  |  | 227.82 | 197 | 0.065 |
| **72** | 1.02±1.03 | 1.55 | -0.39 | 0.60 | 1.82 |  |  |  | 236.93 | 229 | 0.346 |
| **73** | 1.09±1.02 | 2.11 | -0.52 | 0.51 | 1.53 |  |  |  | 211.95 | 198 | 0.236 |
| **74** | 1.33±1.39 | 2.85 | -0.40 | 0.29 | 0.82 | 1.41 |  |  | 241.60 | 201 | 0.026 |
| **75** | 1.23±1.36 | 1.21 | -0.36 | 0.65 | 1.44 | 2.13 |  |  | 294.15 | 264 | 0.098 |
| **76** | 0.72±1.02 | 1.56 | 0.14 | 1.66 | 2.15 | 2.64 |  |  | 179.08 | 162 | 0.170 |
| **77** | 0.94±1.05 | 0.94 | -0.43 | 1.44 | 2.69 | 4.10 |  |  | 266.31 | 248 | 0.203 |

*Note:* ***a*** refers to [discrimination](javascript:;) of an item. ***b*** refers to location parameter of an item.

**TABLE** **S4** **|** Correlation between CAT-ED and *The SCOFF Questionnaire* under different stopping rules

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***The Pearson’s correlations*** | ***The Whole Item Bank*** | ***Stopping Rule*** | | | | |
| ***SE****≤****0.2*** | ***SE****≤****0.3*** | ***SE****≤****0.4*** | ***SE****≤****0.5*** | ***SE****≤****0.6*** |
| *r* | 0.711\*\*\* | 0.707\*\*\* | 0.688\*\*\* | 0.677\*\*\* | 0.664\*\*\* | 0.646\*\*\* |

*Note: \**\**\* shows the discrepancy on 0.001 levels notable.*



**FIGURE S1** **|** Area Under Curve (AUC) under different stopping rules