

Factor validation and Rasch analysis of the individual recovery outcomes counter (I.ROC)

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Appendix: Supplementary material

Table S1

Reliability and validity measures for alternative Individual Recovery Outcomes Counter

scoring measures

| Re-scoring method | <u>Separation</u> | | <u>Reliability</u> | | <u>Infit</u> | | <u>Outfit MNSQ</u> | |
|--------------------------------------|-------------------|-------|--------------------|------|--------------|------|--------------------|------|
| | Person | Item | Person | Item | Person | Item | Person | Item |
| A. 1-2-3-4-5-6 (original scoring) | 2.46 | 18.13 | .86 | 1.00 | 1.04 | 1.01 | 1.03 | 1.03 |
| B. 1-2-3-(4-5)-6 = 1-2-3-4-5 | 2.42 | 18.37 | .85 | 1.00 | 1.02 | 1.00 | 1.02 | 1.02 |
| C. 1-(2-3-4)-5-6 = 1-2-3-4 | 2.11 | 16.66 | .82 | 1.00 | 1.00 | 1.00 | 0.99 | 0.99 |
| D. (1-2)-(3-4)-(5-6) = 1-2-3 | 2.16 | 16.58 | .82 | 1.00 | 1.01 | 1.00 | 1.02 | 1.02 |
| E. 1-(2-3)-(4-5)-6 = 1-2-3-4 | 2.25 | 16.75 | .84 | 1.00 | 1.02 | 1.00 | 1.00 | 1.00 |
| F. (1-2)-3-(4-5)-6 = 1-2-3-4 | 2.22 | 16.66 | .83 | 1.00 | 1.01 | 1.00 | 1.01 | 1.01 |

Infit MNSQ (mean square) = outlier sensitive fit statistic; it is sensitive to unexpected observations by service users on items that are relatively very hard or very easy for them (and vice versa); Outfit MNSQ = Inlier-pattern-sensitive fit statistic, sensitive to unexpected responses by service users on items that are roughly targeted on them (and vice versa).

Table S2: *Fit indices for Confirmatory Factor Analysis using 4-category Individual Recovery Outcomes Counter scoring method*
1-(2-3)-(4-5)-6 = 1-2-3-4

| Fit Index | Notional four domain (HOPE) structure ^a | New 2-Factor Structure ^b | Original 2-Factor structure ^c | Single factor structure |
|--------------------------------|--|-------------------------------------|--|-------------------------|
| Comparative Fit Index | 0.949 | 0.949 | 0.906 | 0.902 |
| Normed Fit Index | 0.929 | 0.939 | 0.899 | 0.895 |
| Goodness of Fit Index | 0.972 | 0.973 | 0.929 | 0.927 |
| Adjusted Goodness of Fit Index | 0.957 | 0.961 | 0.910 | 0.909 |
| RMSEA (90% C.I.) | 0.0536 (0.0477-0.0597) | 0.0507 (0.0451-0.0565) | 0.0805 (0.0751-0.0861) | 0.0815 (0.0760-0.0870) |
| X ² | 288.666 | 290.650 | 652.284 | 678.479 |
| DF (<i>p</i> <0.00001) | 48 | 53 | 53 | 54 |

^a Home (Mental health; Life skills; Safety and comfort); Oppportunity (Physical health; Exercise and activity; Purpose and direction); People (Personal network; Social network; Valuing myself; Empowerment (Participation and control; Self-management; Hope for the future).

^b Factor 1: Self management; Participation and control; Hope for the future; Valuing myself; Mental health; Safety and comfort; Life skills; Personal network. Factor 2: Exercise and activity; Physical health; Purpose and direction; Social network.

^c Factor 1: Self management; Participation and control; Physical health; Valuing myself; Mental health; Safety and comfort; Life skills; Personal network. Factor 2: Exercise and activity; Hope for the future; Purpose and direction; Social network (i.e. physical health and Hope for the future 'swap places').

RMSEA = Root Mean Square Error of the Approximation. CI = Confidence Interval. DF = Degrees of Freedom.

Table S3

Fit indices for Confirmatory Factor Analysis using scoring methods indicated

| Fit Index | Notional four domain (HOPE) structure ^a (original 6-category scoring) 1-2-3-4-5-6 | Original 2-Factor structure ^b (6-category scoring) 1-2-3-4-5-6 | Notional four domain (HOPE) structure ^a with 5-category scoring 1-2-3-(4-5)-6 = 1-2-3-4-5 | Original 2-Factor structure ^b with 5-category scoring 1-2-3-(4-5)-6 = 1-2-3-4-5 |
|--------------------------------|---|---|--|--|
| Comparative Fit Index | 0.945 | 0.942 | 0.942 | 0.939 |
| Normed Fit Index | 0.927 | 0.933 | 0.935 | 0.930 |
| Goodness of Fit Index | 0.966 | 0.964 | 0.967 | 0.965 |
| Adjusted Goodness of Fit Index | 0.946 | 0.948 | 0.947 | 0.948 |
| RMSEA (90% CI) | 0.0612 (0.0555-0.0672) | 0.0599 (0.0544-0.0656) | 0.0608 (0.0549-0.0667) | 0.0598 (0.0542-0.0645) |
| X ² | 362.062 | 384.79 | 357.01 | 383.43 |
| DF ($p < 0.00001$) | 48 | 53 | 48 | 53 |

^a Home (Mental health; Life skills; Safety and comfort); Opportunity (Physical health; Exercise and activity; Purpose and direction; People (Personal network; Social network; Valuing myself; Empowerment (Participation and control; Self-management; Hope for the future).

^b Factor 1: Self management; Participation and control; Hope for the future; Valuing myself; Mental health; Safety and comfort; Life skills; Personal network. Factor 2: Exercise and activity; Physical health; Purpose and direction; Social network.

RMSEA = Root Mean Square Error of the Approximation. CI = Confidence Interval. DF = Degrees of Freedom.

Table S4

Fit indices for confirmatory factor analysis using scoring methods indicated

| Fit Index | Notional four domain (HOPE) structure ^a (3-category scoring) | Original 2-Factor ^b structure (3-category scoring) |
|--------------------------------|---|---|
| Comparative Fit Index | 0.938 | 0.933 |
| Normed Fit Index | 0.929 | 0.923 |
| Goodness of Fit Index | 0.968 | 0.965 |
| Adjusted Goodness of Fit Index | 0.948 | 0.948 |
| RMSEA (90% C.I) | 0.0591 (0.0532-0.0644) | 0.0587 (0.0532-0.0644) |
| X ² | 340.24 | 371.63 |
| DF ($p < 0.00001$) | 48 | 53 |

^a Home (Mental health; Life skills; Safety and comfort); Oppportunity (Physical health; Exercise and activity; Purpose and direction; People (Personal network; Social network; Valuing myself; Empowerment (Participation and control; Self-management; Hope for the future).

^b Factor 1: Self management; Participation and control; Hope for the future; Valuing myself; Mental health; Safety and comfort; Life skills; Personal network. Factor 2: Exercise and activity; Physical health; Purpose and direction; Social network.

RMSEA = Root Mean Square Error of the Approximation. CI = Confidence Interval. DF = Degrees of Freedom.

Table S5: *Fit indices for confirmatory factor analysis using 4-category Individual Recovery Outcomes Counter scoring 1-(2-3)-(4-5)-6. Outlier data removed*

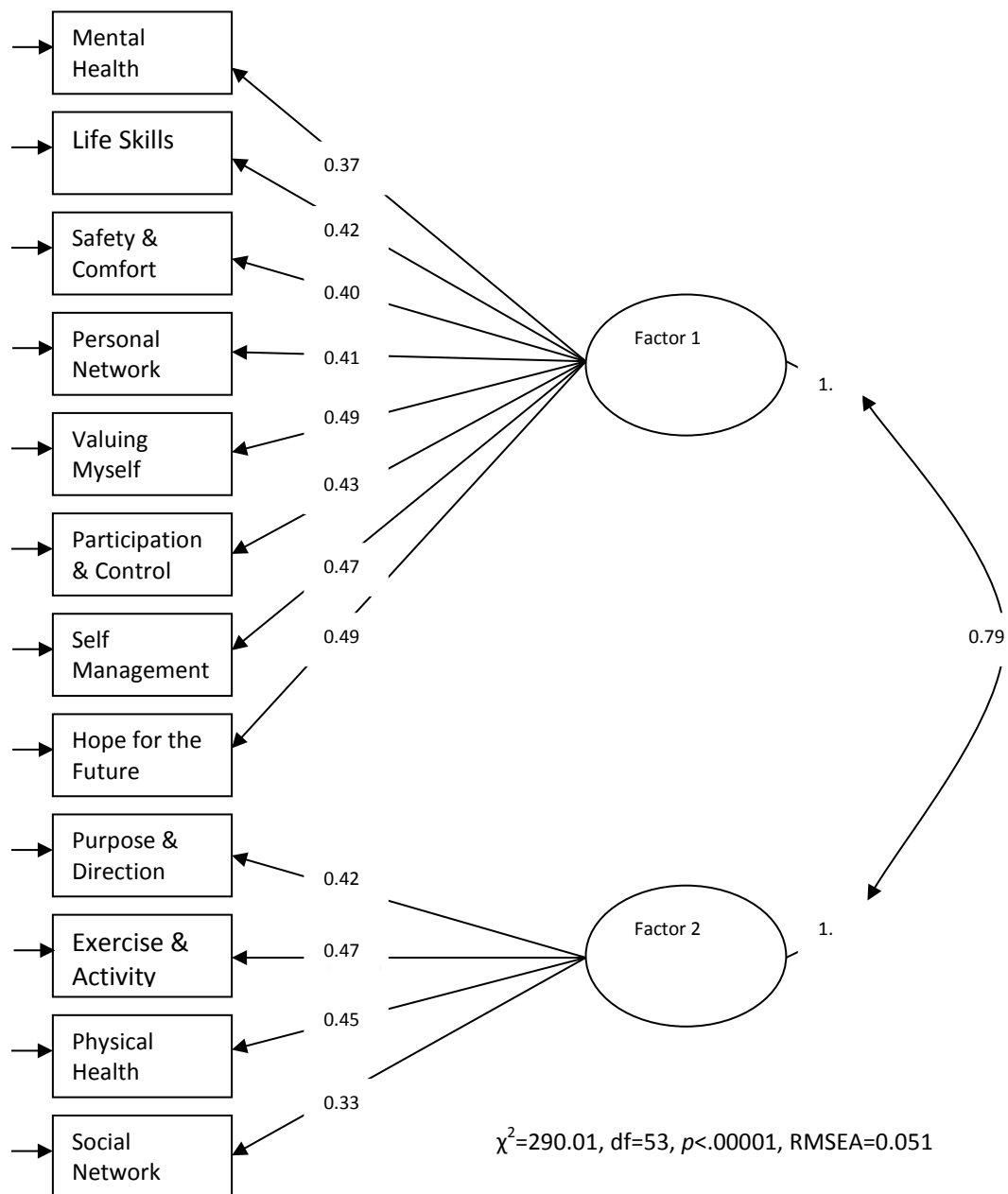
| Fit Index | Notional four domain (HOPE) structure ^a | New 2-Factor Structure ^b |
|--------------------------------|--|-------------------------------------|
| Comparative Fit Index | 0.951 | 0.0951 |
| Normed Fit Index | 0.0942 | 0.0941 |
| Goodness of Fit Index | 0.0972 | 0.0972 |
| Adjusted Goodness of Fit Index | 0.0956 | 0.0960 |
| RMSEA (90% C.I) | 0.0538 (0.0479-0.0599) | 0.0514 (0.0457-0.0572) |
| X ² | 286.356 | 292.878 |
| DF ($p < 0.00001$) | 48 | 53 |

^a Home (Mental health; Life skills; Safety and comfort); Oppportunity (Physical health; Exercise and activity; Purpose and direction; People (Personal network; Social network; Valuing myself; Empowerment (Participation and control; Self-management; Hope for the future).

^b Factor 1: Self management; Participation and control; Physical health; Valuing myself; Mental health; Safety and comfort; Life skills; Personal network. Factor 2: Exercise and activity; Hope for the future; Purpose and direction; Social network (i.e. physical health and Hope for the future ‘swap places from the 2-Factor structure reported in Hardie et al., 2013).

RMSEA = Root Mean Square Error of the Approximation. CI = Confidence Interval. DF = Degrees of Freedom.

Figure S2: *Confirmatory factor analysis of the 2-factor intrapersonal interpersonal personal recovery model.*



Note the high (0.79) correlation between the factors which suggests that a single superordinate factor is present. As a result we reanalysed the data with covariance between the factors set at zero as is the assumption of the model. In these circumstances model fit was substantially poorer ($RMSEA=0.0649$). $RMSEA$ = Root Mean Square Error of the Approximation.