# Supplementary materials

## Sample size estimation

Velicer & Fava1 showed that minimum sample size should not be a function of the number of indicators when the model involves latent variables, as these rules of thumb are not supported by evidence and lead to inaccurate estimates. They emphasized the importance of the number of indicators per latent variable. Marsh & Bailey2 and Boomsma3 suggested that the ratio of indicator per latent variable is a better basis to calculate adequate sample size. Increasing the number of indicators per latent variable maximizes the amount of information available for estimating parameters, as well as the collection of more data. Based on the previous work of Marsh4–6, Westland7 suggested the following formula to calculate sample size: **n ≥ 50r² - 450r + 1100** (where r is the ratio of indicators per latent variable). We followed relatively conservative recommendations8 and included 15 observations per variable for additional observed variables and covariates not included in a latent variable.

Our most complete model included five latent variables manifested by 23 indicators; thus r = 4.6. According to the formula cited above, our sample should have been greater than 88 subjects. In addition to the latent variable, there were two observed variables not included in a latent variable and two covariates (age and age at onset), thus necessitating 60 additional subjects. The total recommended sample size for our most complete model was **148** participants.

### References

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3. Boomsma A. The robustness of LISREL against small sample sizes in factor analysis models. *Syst Indirect Obs Causality Struct Predict*. 1982:149-173.

4. Marsh HW, Balla JR, McDonald RP. Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychol Bull*. 1988;103(3):391-410. doi:10.1037/0033-2909.103.3.391

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7. Westland CJ. Lower bounds on sample size in structural equation modeling. November 2010. doi:DOI: 10.1016/j.elerap.2010.07.003

8. Stevens J. *Applied Multivariate Statistics for the Social Sciences*. Mahwah (New Jersey): L. Erlbaum Associates; 1996.

## Table S1. Fit of latent variables and factor loadings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | CFI | RMSEA [90% CI] | SRMR | b | SE | ß | p |
| Cognition | 0.983 | [0.038; 0.088] | 0.024 |  |  |  |  |
| *Working memory* |  |  |  | 1 |  | 0.4 |  |
| *Reasoning* |  |  |  | 1.76 | 0.18 | 0.7 | < 0.01 |
| *Executive functions* |  |  |  | 2 | 0.21 | 0.8 | < 0.01 |
| *Attention* |  |  |  | 1.94 | 0.21 | 0.78 | < 0.01 |
| *Processing speed* |  |  |  | 1.56 | 0.18 | 0.61 | < 0.01 |
| *Memory* |  |  |  | 1.42 | 0.18 | 0.57 | < 0.01 |
| Quality of life | 0.996 | [0; 0.049] | 0.018 |  |  |  |  |
| *Autonomy* |  |  |  | 1 |  | 0.63 |  |
| *Physical WB* |  |  |  | 1.1 | 0.07 | 0.7 | < 0.01 |
| *Psychological WB* |  |  |  | 0.94 | 0.08 | 0.6 | < 0.01 |
| *Relat. with friends* |  |  |  | 0.73 | 0.07 | 0.46 | < 0.01 |
| *Relat. with family* |  |  |  | 0.41 | 0.07 | 0.26 | < 0.01 |
| *Self-esteem* |  |  |  | 1.3 | 0.07 | 0.82 | < 0.01 |
| *Sentimental life* |  |  |  | 0.83 | 0.07 | 0.52 | < 0.01 |
| Insight | 1 | 0 | 0 |  |  |  |  |
| *SUMD* |  |  |  | 1 |  | 0.63 |  |
| *BIS* |  |  |  | -1.45 | 0.09 | -0.91 | < 0.01 |
| *PANSS G12* |  |  |  | -1.27 | 0.08 | -0.8 | < 0.01 |
| Cognitive reserve | 1 | 0 | 0 |  |  |  |  |
| *Education level* |  |  |  | 1 |  | 0.57 |  |
| *Premorbid IQ* |  |  |  | 1.24 | 0.11 | 0.7 | < 0.01 |
| *WAIS Information* |  |  |  | 1.61 | 0.14 | 0.92 | < 0.01 |

CFI : confirmatory fit index, RMSEA : root mean square error of approximation, SRMR : standardized root mean square residual, b : unstandardized factor loading, SE : standard error, ß : standardized factor loading, p : p-value, SUMD : Scale to Assess Unawareness of Mental Disorder, BIS : Birchwood Insight Scale, WB : well-being, relat. : relationships

## Table S2. Correlation between the variables of interest

|  | **Age** | **Age at onset** | **PANSS total without G12** | **PANSS Gen without G12** | **PANSS Pos** | **PANSS Neg** | **Calgary** | **GAF** | **SUMD** | **BIS** | **PANSS G12** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Age** | 1 |  |  |  |  |  |  |  |  |  |  |
| **Age at onset** | 0.56\*\*\* | 1 |  |  |  |  |  |  |  |  |  |
| **PANSS total without G12** | -0.01 | -0.13\*\*\* | 1 |  |  |  |  |  |  |  |  |
| **PANSS Gen without G12** | 0 | -0.13\*\*\* | 0.91\*\*\* | 1 |  |  |  |  |  |  |  |
| **PANSS Pos** | 0.05 | -0.08\* | 0.72\*\*\* | 0.56\*\*\* | 1 |  |  |  |  |  |  |
| **PANSS Neg** | -0.08\* | -0.09\* | 0.77\*\*\* | 0.55\*\*\* | 0.32\*\*\* | 1 |  |  |  |  |  |
| **Calgary** | 0 | -0.04 | 0.28\*\*\* | 0.43\*\*\* | 0.09\* | 0.09\*\* | 1 |  |  |  |  |
| **GAF** | 0.03 | 0.13\*\*\* | -0.66\*\*\* | -0.56\*\*\* | -0.51\*\*\* | -0.54\*\*\* | -0.17\*\*\* | 1 |  |  |  |
| **SUMD** | -0.03 | 0.09\* | 0.3\*\*\* | 0.17\*\*\* | 0.29\*\*\* | 0.33\*\*\* | -0.12\*\* | -0.27\*\*\* | 1 |  |  |
| **BIS** | 0.06 | -0.11\*\* | -0.12\*\* | -0.02 | -0.11\*\* | -0.2\*\*\* | 0.13\*\*\* | 0.12\*\* | -0.56\*\*\* | 1 |  |
| **PANSS G12** | 0.01 | 0.07 | 0.45\*\*\* | 0.29\*\*\* | 0.41\*\*\* | 0.44\*\*\* | -0.13\*\*\* | -0.36\*\*\* | 0.72\*\*\* | -0.5\*\*\* | 1 |
| **SQOL Autonomy** | 0 | 0.04 | -0.26\*\*\* | -0.3\*\*\* | -0.17\*\*\* | -0.13\*\*\* | -0.29\*\*\* | 0.28\*\*\* | 0.02 | -0.08\* | -0.03 |
| **SQOL Phys WB** | -0.01 | 0 | -0.15\*\*\* | -0.24\*\*\* | -0.07\* | -0.01 | -0.34\*\*\* | 0.15\*\*\* | 0.1\*\* | -0.18\*\*\* | 0.09\* |
| **SQOL Psych WB** | 0.01 | 0.01 | -0.21\*\*\* | -0.29\*\*\* | -0.09\* | -0.08\* | -0.35\*\*\* | 0.17\*\*\* | 0.09\* | -0.14\*\*\* | 0.09\* |
| **SQOL Friends** | -0.04 | 0.06 | -0.18\*\*\* | -0.22\*\*\* | -0.06 | -0.14\*\*\* | -0.29\*\*\* | 0.21\*\*\* | 0.02 | -0.07 | 0 |
| **SQOL Family** | -0.17\*\*\* | -0.03 | -0.12\*\* | -0.12\*\* | -0.15\*\*\* | -0.03 | -0.11\*\* | 0.08\* | -0.07 | 0.04 | -0.07 |
| **SQOL Self-esteem** | 0.05 | 0.07 | -0.19\*\*\* | -0.3\*\*\* | -0.08\* | -0.02 | -0.54\*\*\* | 0.18\*\*\* | 0.13\*\*\* | -0.2\*\*\* | 0.13\*\*\* |
| **SQOL Sentimental life** | -0.02 | 0.02 | -0.14\*\*\* | -0.21\*\*\* | -0.08\* | -0.04 | -0.25\*\*\* | 0.2\*\*\* | -0.02 | -0.04 | 0.01 |
| **Education** | 0.14\*\*\* | 0.22\*\*\* | -0.17\*\*\* | -0.16\*\*\* | -0.09\* | -0.16\*\*\* | -0.02 | 0.2\*\*\* | -0.08\* | 0.07 | -0.1\* |
| **Premorbid IQ** | 0.17\*\*\* | 0.11\* | -0.09\* | -0.03 | -0.09\* | -0.12\*\* | 0.07 | 0.19\*\*\* | -0.05 | 0.13\*\* | -0.08 |
| **WAIS Info** | 0.21\*\*\* | 0.15\*\*\* | -0.13\*\* | -0.1\* | -0.06 | -0.13\*\* | 0.05 | 0.14\*\* | -0.05 | 0.07 | -0.03 |
| **Working memory** | -0.06 | 0.01 | -0.16\*\*\* | -0.13\*\* | -0.07 | -0.18\*\*\* | 0.01 | 0.08\* | 0.02 | 0.05 | -0.09\* |
| **Executive functions** | -0.06 | 0.03 | -0.3\*\*\* | -0.24\*\*\* | -0.18\*\*\* | -0.3\*\*\* | -0.01 | 0.32\*\*\* | -0.12\*\* | 0.1\* | -0.14\*\*\* |
| **Reasoning** | -0.12\*\* | 0.02 | -0.26\*\*\* | -0.23\*\*\* | -0.13\*\*\* | -0.24\*\*\* | 0.04 | 0.21\*\*\* | -0.06 | 0.12\*\* | -0.12\*\* |
| **Attention** | 0.08 | 0.1 | -0.26\*\*\* | -0.21\*\*\* | -0.19\*\*\* | -0.22\*\*\* | 0.02 | 0.23\*\*\* | -0.02 | 0.1\* | -0.14\*\* |
| **Processing speed** | -0.16\*\*\* | -0.03 | -0.25\*\*\* | -0.22\*\*\* | -0.14\*\*\* | -0.23\*\*\* | -0.01 | 0.24\*\*\* | -0.05 | 0.07 | -0.08\* |
| **Memory** | -0.09\* | 0.02 | -0.22\*\*\* | -0.19\*\*\* | -0.14\*\*\* | -0.2\*\*\* | -0.03 | 0.18\*\*\* | -0.08 | 0.15\*\*\* | -0.1\* |

Table S2 (continued)

|  | **SQOL Autonomy** | **SQOL**  **Phys WB** | **SQOL**  **Psych WB** | **SQOL Friends** | **SQOL**  **Family** | **SQOL**  **Self-esteem** | **SQOL Sentim life** | **Education** | **Premorbid IQ** | **WAIS Info** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SQOL Autonomy** | 1 |  |  |  |  |  |  |  |  |  |
| **SQOL Phys WB** | 0.44\*\*\* | 1 |  |  |  |  |  |  |  |  |
| **SQOL Psych WB** | 0.33\*\*\* | 0.43\*\*\* | 1 |  |  |  |  |  |  |  |
| **SQOL Friends** | 0.27\*\*\* | 0.32\*\*\* | 0.32\*\*\* | 1 |  |  |  |  |  |  |
| **SQOL Family** | 0.21\*\*\* | 0.19\*\*\* | 0.13\*\*\* | 0.28\*\*\* | 1 |  |  |  |  |  |
| **SQOL Self-esteem** | 0.54\*\*\* | 0.57\*\*\* | 0.49\*\*\* | 0.38\*\*\* | 0.19\*\*\* | 1 |  |  |  |  |
| **SQOL Sentimental life** | 0.32\*\*\* | 0.37\*\*\* | 0.34\*\*\* | 0.43\*\*\* | 0.14\*\*\* | 0.42\*\*\* | 1 |  |  |  |
| **Education** | 0.03 | -0.04 | 0.05 | 0.09\* | 0.04 | -0.01 | 0.03 | 1 |  |  |
| **Premorbid IQ** | -0.05 | -0.14\*\* | -0.01 | 0.01 | 0 | -0.1\* | -0.07 | 0.4\*\*\* | 1 |  |
| **WAIS Info** | -0.06 | -0.09\* | 0.01 | 0 | 0 | -0.07 | -0.09\* | 0.52\*\*\* | 0.63\*\*\* | 1 |
| **Working memory** | -0.03 | -0.12\*\* | -0.03 | -0.03 | 0.03 | -0.07 | -0.12\*\* | 0.18\*\*\* | 0.15\*\*\* | 0.03 |
| **Executive functions** | 0.04 | -0.12\*\* | -0.02 | 0.07 | 0.03 | -0.07 | -0.04 | 0.35\*\*\* | 0.4\*\*\* | 0.42\*\*\* |
| **Reasoning** | -0.04 | -0.14\*\*\* | 0 | 0.02 | 0.04 | -0.11\*\* | -0.09\* | 0.39\*\*\* | 0.46\*\*\* | 0.48\*\*\* |
| **Attention** | 0.05 | 0 | 0.05 | -0.05 | 0.01 | -0.06 | -0.08 | 0.24\*\*\* | 0.34\*\*\* | 0.28\*\*\* |
| **Processing speed** | 0.08\* | -0.01 | 0.04 | 0.08\* | 0.08\* | -0.01 | 0.01 | 0.28\*\*\* | 0.28\*\*\* | 0.28\*\*\* |
| **Memory** | -0.03 | -0.11\*\* | -0.01 | 0.01 | 0.03 | -0.07 | -0.02 | 0.21\*\*\* | 0.3\*\*\* | 0.31\*\*\* |

Table S2 (continued)

|  | **Working memory** | **Executive functions** | **Reasoning** | **Attention** | **Processing speed** | **Memory** |
| --- | --- | --- | --- | --- | --- | --- |
| **Working memory** | 1 |  |  |  |  |  |
| **Executive functions** | 0.35\*\*\* | 1 |  |  |  |  |
| **Reasoning** | 0.47\*\*\* | 0.56\*\*\* | 1 |  |  |  |
| **Attention** | 0.36\*\*\* | 0.43\*\*\* | 0.34\*\*\* | 1 |  |  |
| **Processing speed** | 0.32\*\*\* | 0.63\*\*\* | 0.53\*\*\* | 0.49\*\*\* | 1 |  |
| **Memory** | 0.15\*\*\* | 0.44\*\*\* | 0.44\*\*\* | 0.28\*\*\* | 0.42\*\*\* | 1 |