**Supplementary Table 1.**

**Demographic and clinical characteristics in participants used in the NART validation analyses.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Participants with schizophrenia****n = 102** | **Participants with bipolar I disorder****n = 101** | **Healthy control participants****n = 613** | **Statistic** |
| Age | 29.3 (9.6) | 31.3 (12.2) | 32.4 (8.8) | F = 5.02, p = 0.007SZ < HC |
| Gender (m/f) | 64/38 | 49/52 | 331/282 | x2 = 4.3, p = 0.016 |
| WASI IQ | 100.5 (15.2) | 107.2 (13.5) | 113.5 (9.9) | F = 66.8, p < 0.001SZ < BD < HC |
| NART IQ | 108.2 (7.3) | 110.9 (7.0) | 113.6 (5.3) | F = 43.3, p < 0.001SZ < BD < HC |
| IQ decline | 7.7 (11.9) | 3.7 (10.6) | 0.1 (8.3) | F = 33.7, p < 0.001SZ > BD > HC |
| Education (years) | 12.6 (2.6) | 13.0 (2.3) | 14.4 (2.2) | F = 38.3, p < 0.001SZ, BD < HC  |
| PANSS positive | 16.7 (5.0)1 | 10.2 (3.8) | - | t = 10.5, p < 0.001 |
| PANSS negative  | 17.6 (5.9)2 | 10.3 (3.6) | - | t = 10.7, p < 0.001 |
| IDS-C  | 18.0 (10.4)3 | 16.3 (11.1)4 | - | t = 1.1, p = 0.291 |
| YMRS | 5.5 (5.2)5 | 3.4 (5.4) | - | t = 2.8, p = 0.005 |

1 n = 100 due to missing data; 2 n = 101 due to missing data; 3 n = 80 due to missing data; 4 n = 98 due to missing data; 5 n = 92 due to missing data

**Supplementary Table 2.**

**Variance Ratio Criterions (VRC) for increasing number of clusters by sample**

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of clusters** | **Participants with schizophrenia****n = 223** | **Participants with bipolar I disorder****n = 175** | **Participants with schizophrenia or bipolar I disorder****n = 398** |
| 2 | 298.96 | 199.13 | 495.09 |
| 3 | 295.44 | 206.59 | 522.54 |
| 4 | 255.94 | 198.60 | 467.36 |
| 5 | 252.90 | 200.81 | 435.45 |

**Supplementary Figure 1.**

**Scree plot based on agglomeration coefficients from hierarchical cluster analysis of premorbid (NART) and current (WASI) IQ in participants with schizophrenia (n = 223).**

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**Supplementary Figure 2.**

**Scree plot based on agglomeration coefficients from hierarchical cluster analysis of premorbid (NART) and current (WASI) IQ in participants with bipolar disorder (n = 175).**

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**Supplementary Figure 3.**

**Scree plot based on agglomeration coefficients from hierarchical cluster analysis of premorbid (NART) and current (WASI) IQ in participants with schizophrenia or bipolar disorder (n = 398).**

