**Supplemental Results**

The fit indexes of tested models in schizophrenia are shown in Supplemental Table 1. We first examined the most commonly supported models in the literature for MCCB within schizophrenia (Burton *et al.*, 2013, Lo *et al.*, 2016): the one-factor model (comprised of all nine cognitive measures loading onto a general cognitive factor) and the three-factor model (comprised of Processing Speed (TMT, BACS, CF, and NAB), Attention/Working Memory (CPT, WMS, and LNS) and Learning (HVLT and BVMT)). Both models demonstrated poor fit, with the one-factor model (O1) demonstrating significantly worse fit than the three-factor model (O2).

The better-fitting model was then optimized in schizophrenia to better parse the variation in measures that may be attributable to factors. Examining pairs of measures which likely share method variance (e.g. measures showing similarities in task stimuli or administration) or cognitive domain variance (e.g. measures informing multiple cognitive domains), the most theoretically sound and parsimonious set of measures were allowed to correlate with each other. Analyses thus proceeded with the three-factor model with three specified correlations to optimize model fit: NAB and TMT, as both are timed tasks that require the participant to draw a path from a starting point to an endpoint; NAB and WMS, as these tasks comprise the only spatial measures; and NAB and CPT, as both tasks overlap in holding multiple items in working memory (i.e. maintaining relative locations and paths in Mazes vs. maintaining digit sequences in CPT). After correlating these three pairs of residuals, fit statistics improved considerably in the schizophrenia group (O3). This model was then examined in ASD.

Supplemental Table 1

Fit indexes across candidate configural models in schizophrenia

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Model* | *Comparison* | *χ2* | *df* | *p* | *CFI* | *ΔCFI* | *TLI* | *RMSEA* | *SRMR* | *Decision* |
| 1. Schizophrenia – one-factor model
 | - | 80.914 | 27 | <.001 | .750 | - | .667 | .141 | .095 | Reject |
| 1. Schizophrenia – three-factor model
 | 2 to 1 | 46.629 | 24 | .004 | .895 | .145 | .843 | .097 | .074 | Modify |
| 1. Schizophrenia – three-factor model with correlated residuals
 | 3 to 2 | 28.725 | 21 | .121 | .964 | .069 | .939 | .061 | .064 | Accept |

Supplemental Table 2

Tests of partial scalar and residual invariance

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Constrained Parameter* | *Comparison* | *χ2* | *df* | *p* | *CFI* | *ΔCFI* | *TLI* | *RMSEA* | *SRMR* | *Invariant* |
| *Constrained Intercept* |
| 1. Full Metric Invariance (Table 2, Model 6)
 | - | 63.522 | 48 | .066 | .971 | - | .956 | .055 | .063 | - |
| 1. BACS
 | B to A | 74.736 | 49 | .065 | .970 | .001 | .956 | .055 | .065 | Yes |
| 1. CF
 | C to B | 72.852 | 50 | .019 | .957 | **.013** | .938 | .066 | .072 | No |
| 1. NAB
 | D to B | 65.724 | 50 | .067 | .970 | <.001 | .957 | .054 | .064 | Yes |
| 1. WMS
 | E to D | 75.462 | 51 | .015 | .954 | **.016** | .935 | .067 | .070 | No |
| 1. LNS
 | F to D | 68.163 | 51 | .054 | .968 | .002 | .954 | .056 | .067 | Yes |
| 1. BVMT
 | G to F | 70.364 | 52 | .046 | .965 | .003 | .952 | .058 | .066 | Yes |
| *Constrained Residual Variance* |
| 1. Partial Scalar Invariance (Table 2, Model 8)
 | - | 70.364 | 52 | .046 | .965 | .003 | .952 | .058 | .066 | - |
| 1. BACS
 | I to H | 71.686 | 53 | .045 | .965 | <.001 | .952 | .058 | .067 | Yes |
| 1. NAB
 | J to I | 71.758 | 54 | .053 | .966 | <.001 | .955 | .056 | .067 | Yes |
| 1. LNS
 | K to J | 75.309 | 55 | .036 | .962 | .004 | .950 | .059 | .071 | Yes |
| 1. BVMT
 | L to K | 75.634 | 56 | .041 | .963 | <.001 | .952 | .057 | .071 | Yes |

*Note.* ΔCFI values>.01 appear in boldface. BACS: Brief Assessment of Cognition in Schizophrenia, Coding subtest; BVMT: Brief Visuospatial Memory Test-Revised; CF: Category fluency; CPT: Continuous Performance Test- Identical Pairs; HVLT: Hopkins Verbal Learning Test – Revised; LNS: Letter Number Span; NAB: Neuropsychological Assessment Battery, Mazes subtest; TMT: Trail Making Test, Part A; WMS: Wechsler Memory Scale – Third Edition, Spatial Span subtest. Because TMT, CPT, and BVMT were the reference measures for their respective factors, their loadings had been constrained to 1 in testing metric invariance; thus, it was unnecessary for their intercepts and variances to be constrained to equivalence.

For constrained intercepts, each intercept was constrained to equivalence after constraining all loadings to equivalence across schizophrenia and ASD. For constrained residual variances, the residual variance and covariance of items with invariant factor loadings and invariant intercepts were constrained to equivalence across schizophrenia and ASD.

**Supplemental References**

**Burton, C. Z., Vella, L., Harvey, P. D., Patterson, T. L., Heaton, R. K. & Twamley, E. W.** (2013). Factor structure of the MATRICS Consensus Cognitive Battery (MCCB) in schizophrenia. *Schizophrenia Research* **146**, 244-8.

**Lo, S. B., Szuhany, K. L., Kredlow, M. A., Wolfe, R., Mueser, K. T. & McGurk, S. R.** (2016). A confirmatory factor analysis of the MATRICS consensus cognitive battery in severe mental illness. *Schizophrenia Research* **175**, 79-84.