Data Supplement for Kern et al., The MATRICS Consensus Cognitive Battery, Part 2: Co-Norming and Standardization, American Journal of Psychiatry, January 2008

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A. Supplementary Tables

Supplementary TABLE 1. Tests Administered to a Community Standardization Sample in Phase 2 of the MATRICS Psychometric and Standardization Study

Test and Reference Number	Test Score Used
MATRICS Consensus Cognitive Battery	
Trail Making Test, Part A (1)	Time to completion
Brief Assessment of Cognition in Schizophrenia, symbol coding subtest (2)	Total number correct
Hopkins Verbal Learning Test—Revised, immediate recall subtest (3)	Total number of words recalled correctly over three learning trials
Wechsler Memory Scale, 3rd ed., spatial span task (4)	Sum of raw scores on forward and backward conditions
Letter-Number Span test (5)	Number of correct trials
Neuropsychological Assessment Battery, mazes subtest (6)	Total raw score
Brief Visuospatial Memory Test—Revised (7)	Total recall score over three learning trials
Category fluency test, animal naming (8)	Total number of animals named in 60 seconds
Mayer-Salovey-Caruso Emotional Intelligence Test, managing emotions subtest (9)	Branch score using general consensus scoring
Continuous Performance Test—Identical Pairs version (10)	Mean d′ value across 2-, 3-, and 4-digit conditions
Supplemental tests	
Neuropsychological Assessment Battery, daily living memory subtest (6)	Total raw score
Brief Assessment of Cognition in Schizophrenia, Tower of London subtest (2)	Total number correct
Neuropsychological Assessment Battery, shape learning subtest (6)	Total raw score

Supplementary TABLE 2. Test Norms, by Age Group (Non-Transformed Raw Scores)

	Age Group					
	20–39 years (N=100)		40–49 years (N=100)		50–59 years (N=100)	
Test	Mean	SD	Mean	SD	Mean	SD
MATRICS Consensus Cognitive Battery						
Trail Making Test, Part A	24.6	7.7	26.5	7.9	32.9	11.6
Brief Assessment of Cognition in Schizophrenia, symbol coding subtest	62.2	10.4	56.0	8.0	52.2	11.4
Hopkins Verbal Learning Test—Revised, immediate recall subtest	28.0	4.3	28.3	4.1	26.8	5.2
Wechsler Memory Scale, 3rd ed., spatial span task	17.4	3.0	16.1	3.1	15.0	3.4
Letter-Number Span test	16.3	3.6	16.2	2.9	15.2	3.3
Neuropsychological Assessment Battery, mazes subtest	21.9	3.9	18.1	6.0	15.3	6.4
Brief Visuospatial Memory Test—Revised	27.8	4.8	24.6	6.3	20.6	7.1
Category fluency test, animal naming	24.0	5.6	23.7	5.1	22.0	5.9
Mayer-Salovey-Caruso Emotional Intelligence Test, managing emotions subtest	95.6	7.9	98.7	9.1	99.0	9.3
Continuous Performance Test—Identical Pairs version	3.08	0.62	2.98	0.69	2.77	0.72
Supplemental tests						
Neuropsychological Assessment Battery, daily living memory subtest	44.7	4.2	44.6	4.6	43.0	4.7
Brief Assessment of Cognition in Schizophrenia, Tower of London subtest	16.9	3.4	15.9	4.2	15.4	4.1
Neuropsychological Assessment Battery, shape learning subtest	19.4	3.5	18.0	3.6	16.9	3.9

B. Expanded Results

Age Effects, With Follow-Up Contrasts

The one-way analyses of variance (ANOVAs) to assess age effects revealed a significant overall effect for six of the seven cognitive domains plus the overall composite score (see Figure 1 in the article; speed of processing: $F=25.45$, $df=2, 296$, $p<0.001$; attention/vigilance: $F=5.39$, $df=2, 293$, $p<0.005$; working memory: $F=10.00$, $df=2, 295$, $p<0.001$; visual learning: $F=34.12$, $df=2, 296$, $p<0.001$; reasoning and problem solving: $F=34.54$, $df=2, 295$, $p<0.001$; overall composite score: $F=19.25$, $df=2, 287$, $p<0.001$). The only cognitive domain that did not show a significant age effect was verbal learning, which revealed a nonsignificant trend in the expected direction ($p=0.11$). The pattern of age effects was similar across cognitive domains, with the exception of social cognition. In general, younger participants performed better than older ones. For reasoning and problem solving, visual learning, speed of processing, and the overall composite score, each age group differed significantly from each other (younger > middle > older). For working memory, the younger and middle age groups performed better than the older age group but did not differ significantly from one another (younger, middle > older). This same pattern was observed for attention/vigilance, except that the difference between the middle and older age groups fell to the level of a nonsignificant trend ($p=0.07$). For social cognition ($F=4.56$, $df=2, 294$, $p<.001$), the younger age group performed worse than the middle and older age groups, with the latter two groups not differing significantly from one another (younger < middle, older).

Gender Effects

The analyses examining gender effects yielded a mixed pattern of results. Significant differences between men and women were observed in three of the seven cognitive domains (see Figure 2 in the article). Men performed better than women on the reasoning and problem solving and working memory measures ($t=2.45$, $df=296$, $p<0.02$, and $t=3.09$, $df=296$, $p<0.01$, respectively). Women performed better than men on the verbal learning measure ($t=–2.05$, $df=298$, $p<0.05$). There were no statistically significant differences between men and women on the other four cognitive domains or the overall composite score.

Education Effects, With Follow-Up Contrasts

Education effects were highly consistent across all cognitive domains. The one-way ANOVAs revealed a significant overall effect on all seven cognitive domains plus the overall composite score (see Figure 3 in the article; speed of processing: $F=20.69$, $df=2, 296$, $p<0.001$; attention/vigilance: $F=31.17$, $df=2, 293$, $p<0.001$; working memory: $F=15.10$, $df=2, 295$, $p<0.001$; verbal learning: $F=14.65$, $df=2, 297$, $p<0.001$; visual learning: $F=13.92$, $df=2, 296$, $p<0.001$; reasoning and problem solving: $F=4.24$, $df=2, 295$, $p<0.02$; social cognition: $F=3.43$, $df=2, 294$, $p<0.04$; overall composite score: $F=22.31$, $df=2, 287$, $p<0.001$). The pattern of performance differences was highly similar across cognitive domains, with higher test performance corresponding with higher levels of education. For speed of processing, attention/vigilance, verbal learning, visual learning, and the overall composite score, each educational group differed from one another (high > middle > low). For working memory, the same pattern was observed except that the difference between the low and middle education groups was a nonsignificant trend ($p=0.12$). For reasoning and problem solving, the high education group performed better than the low and middle education groups, with the latter two groups not differing significantly from one another (high > middle, low). For social cognition, the high and middle education groups both performed better than the low education group but did not differ significantly from one another (high, middle > low).

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