

A Comparison of the MATRICS Consensus Cognitive Battery (MCCB) with the Cognitive Drug Research (CDR) System in Schizophrenia



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Background

There is considerable interest in the attempt to treat the cognitive deficits which exist in schizophrenia. The MATRICS Consensus Cognitive Battery (MCCB) has been developed to provide an outcome measure for clinical trials of cognition-enhancing drugs for schizophrenia (www.matrics.ucla.edu). The Cognitive Drug Research (CDR) computerized cognitive assessment system has been employed in worldwide clinical trials over the last 25 years and has been widely used to study the effects of cognition enhancers, in both normal volunteers and a variety of patient populations including schizophrenia. Here we present a comparison of the MCCB and The CDR System in schizophrenic patients.

Methods

- Males and females aged 18-65 years with a primary DSM-IV diagnosis of 59 Schizophrenia or Schizoaffective disorder
- A global severity on the Clinical Global Impression (CGI) scale of 4 or less
- Clinically stable on a stable dose of antipsychotic medication for at least one month, with no current active suicidal ideation
- Screening visit and baseline clinical assessment, with training on The CDR System
- Randomized to one of two study sequences:
 - Visit 3: MCCB >CDR; Visit 4: CDR >MCCB or
 - Visit 3: CDR >MCCB; Visit 4: MCCB >CDR
- Study visits were 3-10 days apart, and each test battery was separated by a 10-15 minute rest period

Assessments



Cognitive Domain	The CDR System 35-45 minutes	MCCB 60-90 minutes
Speed of Processing	<ul style="list-style-type: none"> • Power of Attention (composite of attention task reaction times) • Speed of Memory (composite of memory task reaction times) • Trail-Making Test A 	<ul style="list-style-type: none"> • BACS: Symbol Coding • Category Fluency: Animal Naming • Trail-Making Test A
Attention / Vigilance	<ul style="list-style-type: none"> • Continuity of Attention (composite of attention task accuracy scores) • Fluctuations (composite of attention task reaction time variability) 	<ul style="list-style-type: none"> • Continuous Performance Test - Identical Pairs
Working Memory (Verbal)	<ul style="list-style-type: none"> • Numeric Working Memory 	<ul style="list-style-type: none"> • University of Maryland Letter Number Span
Working Memory (Non-Verbal)	<ul style="list-style-type: none"> • Spatial Working Memory 	<ul style="list-style-type: none"> • Wechsler Memory Scale: Spatial Span
Verbal Learning	<ul style="list-style-type: none"> • Word Recall and Word Recognition 	<ul style="list-style-type: none"> • Hopkins Verbal Learning Test – Revised (HVLTR)
Visual Learning	<ul style="list-style-type: none"> • Picture Recognition 	<ul style="list-style-type: none"> • Brief Visuospatial Memory Test –Revised (BVMTR)
Reasoning and Problem Solving	<ul style="list-style-type: none"> • Neuropsychological Assessment Battery (NAB): Mazes* 	<ul style="list-style-type: none"> • Neuropsychological Assessment Battery (NAB): Mazes
Social Cognition	<ul style="list-style-type: none"> • Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) - computerized administration* 	<ul style="list-style-type: none"> • Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) - pen and paper

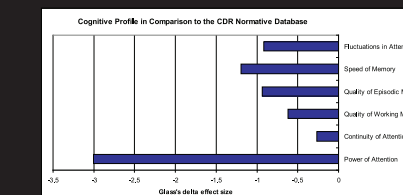
*MCCB version used in this study

The CDR System is a computerized battery of performance tests presented on a laptop computer, with participants responding via a two-button YES/NO response box. The system has >50 equivalent forms and is available in 60 languages.

The MCCB consists of 10 individually administered pen-and-paper, oral, computerized, and spatial tests using geometric cubes. The MCCB is available in English and has 6 alternate forms for some tasks.

Results

Demographics	median	range
Age (years)	43	22-63
Onset of illness (years)	16	2-38
	number	ratio
Gender	Male:Female	32:27
Race	White: Black: Hispanic: Asian	13:44:1:1
Diagnosis	Schizophrenia: Schizoaffective	45:14



Comparison to the CDR Normative Database (v3.0) showed large effect sizes of cognitive deficits, particularly to attention.

Both the MCCB and The CDR System showed similar, satisfactory test-retest reliability. Correlations

between the batteries were also acceptable, demonstrating the tests are assessing the same domains, e.g. MCCB attention/vigilance correlated with CDR Power of Attention ($r=0.38$), Continuity of Attention ($r=0.36$), Fluctuations in Attention ($r=0.43$). Sizeable practice effects were seen on the MCCB verbal and visual memory scores at 20% and 37% respectively, whereas practice effects were negligible on the CDR equivalents.

Conclusions

The CDR System and the MCCB both demonstrated acceptable test-retest reliability. The CDR System showed minimal practice effects between study visits compared to the MCCB, highlighting the benefits of pre-baseline training/familiarization sessions. Where psychometric properties are similar, the selection of assessments in clinical trials may also be influenced by the availability of parallel forms, language versions, and the burden of testing for patients and administrators.