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Cognitive Assessment Interview (CAI): Validity as a Co-Primary Measure of Cognition Across Phases of Schizophrenia

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Abstract

Background: Progress has been made in developing interview-based measures for the assessment of cognitive functioning, such as the Cognitive Assessment Interview (CAI), as co-primary measures that compliment objective neurocognitive assessments and daily functioning. However, a few questions remain, including whether the relationships with objective cognitive measures and daily functioning are high enough to justify the CAI as an co-primary measure and whether patient-only assessments are valid.

Methods: Participants were first-episode schizophrenia patients (n=60) and demographically-similar healthy controls (n=35), chronic schizophrenia patients (n=38) and demographically similar healthy controls (n=19). Participants were assessed at baseline with an interview-based measure of cognitive functioning (CAI), a test of objective cognitive functioning, functional capacity, and role functioning at baseline, and the first episode patients again 6 months later (n=28).

Results: CAI ratings were correlated with objective cognitive functioning, functional capacity, and functional outcomes in first-episode schizophrenia patients at similar magnitudes as in chronic patients. Comparisons of first-episode and chronic patients with healthy controls indicated that the CAI sensitively detected deficits in schizophrenia. The relationship of CAI Patient-Only ratings

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Contributors

The CAI is an interview-based measure of cognition that was developed by Drs. Joseph Ventura, Robert Bilder, Steve Reise, and Richard Keefe. Drs. Keith Nuechterlein, Kenneth Subotnik, and Joseph Ventura obtained funding to conduct the primary study where the data were collected. Drs. Ventura and Nuechterlein trained and supervised research staff on the data collection process and the daily operations of the clinical staff. Dr. Ventura selected the variables of interest, participated in data analysis, and prepared the manuscript. Dr. Hellemann conducted the data analysis and drafted portions of the results. Ms. Ered complied the raw data, coded data, created data bases used for data analysis, preformed literature searches, and created data tables. All authors read and commented on initial drafts and approved the final manuscript.

Conflict of interest

Arielle Ered and Gerhard S. Hellemann have no conflicts of interest to disclose.

with objective cognitive functioning, functional capacity, and daily functioning were comparable to CAI Rater scores that included informant information.

Conclusions: These results confirm in an independent sample the relationship of the CAI ratings with objectively measured cognition, functional capacity, and role functioning. Comparison of schizophrenia patients with healthy controls further validates the CAI as an co-primary measure of cognitive deficits. Also, CAI change scores were strongly related to objective cognitive change indicating sensitivity to change.

Introduction

A good deal of progress has been made in developing interview-based measures of cognition such as the Cognitive Assessment Interview (Ventura et al., 2010b) and the Schizophrenia Cognition Rating Scale (Keefe et al., 2006), as a method for assessing cognitive functioning. These measures have been shown to be reliable, valid, and sensitive to treatment effects (Keefe et al., 2015; Ventura et al., 2013). Early promising work on the CAI has shown modest relationships between interview-based measures and the following domains: objective cognition functioning (MATRICS Consensus Cognitive Battery; MCCB), functional capacity (UCSD Performance-based Skills Assessment: UPSA), and role functioning (Role Functioning Scale; RFS) (Green et al., 2011; Ventura et al., 2010a). In particular, recent validity work has shown stronger relationships with objective cognition and multiple domains of role functioning such as independent living, social interactions, family relationships, and school / work functioning (Ventura et al., 2013). Evidence is mounting which indicates that interview-based approaches to the assessment of cognition can serve a useful role as co-primary measures that capture elements of objective cognitive functioning that are related to role functioning (including: independent living, social relationships, school work functioning, and familial interactions).

As part of the MATRICS initiative, the Food and Drug Administration (FDA) suggested that the use of a single, objective cognitive performance-based measure should be adopted as part of a standardized approach to assessment for the approval of cognitive enhancing drugs. In addition, the FDA decided to require documentation of improvements on a functionally meaningful co-primary measure that has face validity for patients and clinicians (Buchanan et al., 2005). The UPSA was selected by the MATRICS committee as a recommended co-primary measure because of its high correlation with objective neurocognitive functioning. Given the importance of Patient Reported Outcome (PRO) measures in FDA clinical trials, further research on the relationship between the CAI and the MCCB could indicate that the CAI would prove to be useful as a co-primary measure. Research has shown that the CAI is moderately correlated with objective neurocognitive functioning (MCCB), functional capacity (UPSA), and role functioning (RFS). In addition, the CAI is close to patient reported functioning because patients and an informant are asked for their impression of the patient’s cognitive functioning. The CAI is a potential candidate for assessing cognitive change in clinical practice. However, more work is needed to understand how a CAI rater should go about obtaining informant information about a patient’s cognitive functioning and whether patient ratings alone are sufficiently valid.

The CAI, is being proposed for use in situations where objective cognitive assessments are not practical, such as in medication management in clinical practice, when measurement of co-primary variables is needed such as in clinical trials, or when assessments that are more closely related to the patient's experience are desired. Several studies have already shown that the CAI is related to object cognitive performance, with correlations ranging from r=−.31 to r=−.41 and role functioning range from r=.32 to r=.49 (Ventura et al., 2010a; Ventura et al., 2013). Given these moderate relationships between the CAI and objective measures of cognitive performance, the CAI is not being suggested as substitute for objective cognitive testing. Also, the CAI is not a measure of role functioning, but rather an assessment of how cognition influences functioning. The CAI has shown very high test-retest reliability (r = .83, n =93) indicative of small practice effects making the CAI highly repeatable (Ventura et al., 2013). Even though practice effects are also small with the MCCB, the length of the battery administration and scoring process makes the MCCB less practical for routine aspects of clinical practice such as medication management.

As is the case with several interview-based instruments in psychiatry, the assumption is that the psychopathology being evaluated is not present, or is only observed at very low levels, in healthy individuals. Most schizophrenia patients assessed with the CAI are rated an average of 3.5 on a scale of "1" to "7," where "7" indices severe impairment. There is an assumption that healthy individuals would score a "1" and are operating in their daily lives without cognitive impairments interfering with their functioning. Data to document that the ratings on the CAI for healthy subjects are indeed typically "1" would be very helpful to interpretation. Along those lines, the prevalence of cognitive difficulties that impact functioning in the general population has not been assessed with the CAI. The availability of normative data would aid in estimating the magnitude of cognitive change over time relative to the size of the initial deficit. Community normative data for the CAI could facilitate a valid interpretation of severity of cognitive difficulties across research settings and studies.

Study Aims

This aim of this study was to further explore the validity of CAI by examining: 1) cross-sectional relationships with objective cognitive performance tests (MCCB), functional capacity (UPSA), and role functioning (RFS) in first-episode schizophrenia patients, 2) the effect sizes for CAI ratings in schizophrenia patients relative to those of healthy controls, and 3) the sensitivity of the CAI to changes in objective measures of cognition (MCCB). In addition, we evaluated whether CAI ratings based on patient interview only, compared to the CAI ratings based on a combination of patient and informant information, correlated similarly with objective cognitive performance tests, functional capacity, and role functioning

Methods

Subjects

The sample consisted of 60 first-episode schizophrenia patients and 35 demographically-similar controls participating in the pilot studies and the fourth phase of an NIMH-funded project focusing on the early course of schizophrenia (Nuechterlein et al., 2014; Subotnik et

al., 2015), 38 chronic schizophrenia patients and 19 demographically-similar controls from the UCLA Center for Neurocognition and Emotion in Schizophrenia (Table 1). First-episode schizophrenia patients were enrolled in the UCLA Aftercare Research Program, an outpatient clinic that offers medication management, individual case management, group therapy focused on practical life skills, various forms of cognitive training and healty behavior training, and family education for research subjects diagnosed with schizophrenia, schizoaffective disorder (depressed type), or schizophreniform disorder. However, the treatment interventionns were not systematic, i.e. there was no one type of treatment that was provided to all of these patients. All participants were assessed at baseline which was characterized by being on a stable outpatient dose of oral risperidone for at least three weeks prior to data collection. Chronic patients were recruited as a part of a 5 year follow-up study on schizophrenia patients who were initially enrolled in the Aftercare Research Program.

Raters who were trained to criterion levels of reliability (Ventura et al., 1993b) conducted all of the diagnostic and symptom assessments for the patients and healthy controls. A comprehensive description of how the normal controls were recruited, screened, and assessed is available elsewhere (Ventura et al., 2015) so will only be briefly described. Healthy controls were screened using the Structured Clinical Interview for DSM-IV (First et al., 2001) and several symptom rating scales for the absence of major Axis I diagnoses and absence of schizophrenia spectrum personality disorders. All participants were provided with oral and written information about the research procedures and gave written informed consent prior to data collection.

The comparison of first episode patients with healthy controls showed no statistically significant group differences on demographic variables: age, gender, race, or parental education (Table 1). Although the first-episode patients and healthy controls differed on patient education, that variable was not covaried in later analyses because the lower level observed in patients may be viewed as a consequence of the disorder (Meehl, 1969). For the comparison of chronic patients with healthy controls, there were no statistically significant group differences on the following demographic variables: gender, race, patient education, or parental education (Table 1). Although the groups differed significantly in age, we found that age was not significantly correlated with the CAI Patient, CAI Informant, and CAI Rater scores. The patients who did have an informant, compared to those who did not, did not differ significantly on key variables such as age, gender, education, race, or clinical characteristics.

Procedures

Interview-based Assessment of Cognitive Functioning

Cognitive Assessment Interview (CAI): The CAI was derived from two “parent” interview-based instruments, the CGI-CogS and the SCoRS (Reise et al., 2011; Ventura et al., 2010b). As determined by psychometric methods such as Item Response Theory (IRT), the CAI includes 10 items that assess 6 of the 7 MATRICS cognitive domains: speed of processing, attention/vigilance, working memory, verbal learning, reasoning and problem solving, and social cognition. The CAI was administered to the patient as well as an informant, who was required to know the patient well enough to comment on his or her

cognitive functioning (see Table 1). The ratings from those assessments were then integrated into a final CAI Rater score. CAI items were rated on a seven-point scale with defined anchor points referenced to healthy people of a similar educational and socio-cultural background. Higher scores reflect more severe cognitive deficits that impact everyday functioning. The CAI Rater score was based on information from the patient and informant. We examined the CAI Patient, CAI Informant, and CAI Rater scores cross-sectionally at baseline and again at 6 months.

Training and Quality Assurance for the CAI: Training on the CAI was provided to raters that had previous experience with semi-structured psychiatric interviews or symptom rating scales. The training was conducted by the lead author (JV) using didactic material about cognitive deficits, videotaped CAI assessments with accompanying “gold standard” ratings, and included the co-rating of “live” CAI assessments. Raters were required to meet a minimum standard of Intraclass Correlation Coefficient (ICC) = .80 across all items on six CAI training DVDs and at least 2 “live” assessments. Once certified, the raters were entered into a quality assurance program (Ventura et al., 1993a). Patients and healthy controls were simply asked if there was a person who knew them well enough to comment by phone on their cognitive functioning (expressed in non-technical terms). The CAI assessors were blind to the objective cognitive assessments, i.e., MCCB and the UPSA. For approximately half of the interviews of first-episode patients, the CAI interviewer / rater was blind to the functional outcome assessments, allowing for an examination of independently made CAI ratings.

Objective Assessment of Cognition

MATRICS Consensus Cognitive Battery (MCCB)—The objective measure of cognition was the MCCB (Nuechterlein et al., 2008). The current study used the Overall Composite score for the seven MATRICS domains of cognitive functioning (Nuechterlein et al., 2004): Speed of Processing, Attention/Vigilance, Working Memory, Verbal Learning, Visual Learning, Reasoning and Problem Solving, and Social Cognition. The age and gender corrected T-score was used for these analyses. The MCCB was administered at baseline and again at 6 months.

UCSD Performance-based Skills Assessment-Version (UPSA)—The UPSA (Patterson et al., 2001) is a functional capacity measure of five general skills that were previously identified as essential to functioning in the community: organization/planning, finance, communication, transportation, household management and a medication management ability assessment (Patterson et al., 2002). The UPSA involves role-play tasks that are simulations of situations that the person may encounter in the community. Higher scores indicate better performance. The dependent variable was the total score.

Role Functioning Assessment

The Role Functioning Scale (RFS) (Goodman et al., 1993; Green and Gracely, 1987) was administered by trained raters and used as the functional outcome measure for the following domains: Work Productivity, Independent Living, Family Relationships, and Social Relationships. Specific probes were used to cover multiple areas of community functioning.

Higher scores reflect decreasing reliance on agency-related support and increasing independence in community functioning. The Global Role Functioning Index, which is the sum of the four domains, was used as the dependent variable as well as the scores from the individual functional domains (Goodman et al., 1993).

Results

CAI Discriminates between Patients and Controls

We used t-tests to address the question of whether patients perform significantly lower than controls on the CAI (Table 2). The CAI Rater score for first episode patients was significantly worse (higher scores indicate worse performance) compared to the matched controls [M= 3.56 vs. 1.36, $F(1, 57)=10.54$, $p < .01$]. Chronic patients also had significantly higher mean CAI Rater scores compared to their matched controls [M= 3.19 vs. 1.35, $F(1, 53)=5.79$, $p < .01$]. The CAI scores at baseline were significantly lower for both patient groups compared to healthy controls for ratings based on the CAI “Patient (or Healthy Control)” or CAI Informant information. The magnitude of the group differences on the CAI were somewhat larger than the differences observed on the MCCB in this study and in the literature (Table 2).

CAI Ratings are Associated with Objective Cognitive Performance, Functional Capacity, and Role Functioning

An examination of the baseline bivariate relationships, indicated that the CAI Rater score was significantly related in both first episode and chronic patients to objective cognitive performance ($r=-.65$, $p < .01$; $r=-.53$, $p < .01$), functional capacity ($r=-.57$, $p < .01$; $r=-.53$, $p < .01$), and global role functioning ($r=-.46$, $p < .01$; $r=-.61$, $p < .01$), respectively. The correlations were similar for both first-episode and chronic patients for the CAI Patient with objective cognitive performance ($r=-.54$, $p < .01$; $r=-.55$, $p < .01$), functional capacity ($r=-.44$, $p < .01$; $r=-.52$, $p < .01$), and global role functioning ($r=-.36$, $p < .01$; $r=-.58$, $p < .01$), respectively and for the CAI Informant with objective cognitive functioning ($r=-.66$, $p < .01$; $r=-.34$, $p < .01$), functional capacity ($r=-.57$, $p < .01$; $r=-.41$, $p < .01$), and global role functioning ($r=-.45$, $p < .01$; $r=-.50$, $p < .01$), respectively. Only the associations of CAI Informant scores and objective cognitive functioning were statistically different between first episode and chronic patients (p=.04). As there were no major differences between the samples, the first episode and chronic patients were combined for further analyses (Table 3). In those analyses, we found that the CAI Rater scores were significantly correlated with each of the separate domains of role functioning (Table 3).

Addressing possible bias in CAI Rater scores

We were able to address the question of whether being blind to the patient’s role functioning ratings impacted, or could explain, the associations between role functioning ratings and the CAI ratings. Given the workflow in our clinic, some patients were rated by the same interviewer on the CAI as on the Role Functioning Scale (RFS), whereas other patients where rated by independent raters. We conducted a sub-analysis which involved computing correlations among first episode patients for CAI interviewers who were vs. were not blind to role functioning ratings. Surprisingly the association between the CAI Rater score and

ratings of functioning tended to be higher (n=47, r=.75) for raters who were blind to the patient's role functioning, compared to raters who made non-blinded ratings of the patient's role function (n=38, r=.58). However, the difference was not statistically significant (p=.12), which was most likely a consequence of the limited sample size.

Evaluating Whether the CAI can detect change in cognition

We also evaluated whether CAI can be used to detect cognitive change over time by examining whether changes in CAI ratings were associated with changes in objective cognitive performance changes in longitudinal data from the recent-onset schizophrenia sample. We found that the change in objective cognitive performance (MCCB) was significantly correlated with the change in the CAI Rater scores (n=23, r=−52, p = .01) from baseline to six months.

Impact of Availability of the Informant Information

In research or clinical practice, obtaining informants can be challenging so we evaluated whether the information provided by the informant in making CAI ratings is always necessary. This was done by comparing the CAI Rater scores for each participant with their ratings based only on the patient report, CAI Patient). This analyses yielded an ICC=.92, showing that both sets of ratings (CAI Rater and CAI Patient) are highly comparable. In general any ICC>.80 is considered evidence that raters or scales are equivalent. This suggests that the CAI ratings based just on the patient report alone can provide valid information.

Discussion

This is the first study that used an interview-based assessment, the CAI, to assess cognitive functioning in first episode schizophrenia patients. We found that the cognitive deficits known to be present in the early course of schizophrenia can be detected with the CAI, just as they can in chronic patients. This is also the first study to compare CAI ratings in healthy control subjects to those of first-episode and chronic schizophrenia patients. The large effect size found in cognitive functioning on the CAI between patients and controls further validates the CAI's sensitivity to the severity of neurocognitive deficits. These results confirm in an independent sample the relationship of the CAI ratings with objectively measured cognition (MCCB), functional capacity (UPSA), and role functioning (RFS) that we demonstrated in two prior samples (Ventura et al., 2013; Ventura et al., 2010b). We also expand these relationships to first episode patients. We also provide evidence that CAI Patient only ratings are comparable to the CAI Rater scores that take into account information provided by an informant. In fact, the two sources of information, patient and informant, were comparable in predicting all three major outcome indices: cognition, functional capacity, and functional outcome. We found that contacting relatives is feasible and that on average needed information can be obtained by phone in approximately 15 minutes by phone.

Several previous reports have called into question whether the patient's self-report of cognitive functioning can be validly related to objective cognitive functioning (Harvey and

Keefe, 2001; Keefe et al., 2006). One recent report even called into question the validity of a relative's report (Poletti et al., 2012), citing lack of insight into the patient's cognitive functioning as limiting validity. We agree that conducting interview-based assessments with patients alone can be challenging. In fact, several studies have demonstrated that schizophrenia patients do lack insight into their cognitive functioning (Medalia and Thysen, 2010). This is precisely why the CAI was developed, not as a self-report measure, but rather as an interview-based assessment in which the interviewer / rater is required to use his or her expert judgment. We believe that it's possible to obtain valid CAI patient ratings which do not rely on an informant to obtain an accurate appraisal of the patient's cognitive functioning. We agree with Potetti and colleagues (Poletti et al., 2012) and Harvey and colleagues (Durand et al., 2015) that trained professionals can accurately assess the patient's cognition from clinical assessments. We found that both sources of information, patient and informant, provided valid information about the patient's cognitive functioning.

The present study extends the prior CAI findings in several additional ways. First, the CAI was moderately and significantly correlated with each domain of role functioning, including social and family relationships, work and school functioning, and independent living. Second, the correlational relationships were found to be highly similar for first episode and chronic patients. Third, a subset of the CAI assessments that were conducted by raters who were blind to the assessment of role functioning that yielded very similar data to those ratings by non-blind raters. In any event, given the potential for CAI ratings and functional ratings to influence each other, we do recommend extra caution when the CAI rater is the same person who also assesses functioning.

Several study limitations are worthy of mention. The study was conducted in the context of a treatment program in which the CAI raters had greater access to the patients than might typically be the case in routine clinical trials or clinical practice. Also, the CAI raters were knowledgeable about the role of cognition in a patient's daily functioning. However, for the chronic patient subgroup, the procedures closely mimicked settings in which contact with the patients is more limited. The moderately high correlation between the CAI and role functioning could be the result of method variance because administering the CAI involves asking how one's cognition is related to daily functioning. However, CAI raters were trained not to consider poor functioning that was related to low motivation rather than to cognitive deficits.

The advantages of the CAI include little to no practice effect, so the CAI can be used in repeated assessment designs, or before and after treatment interventions to supplement objective cognitive testing. For such research applications, approximately 6–8 hours of CAI training are recommended. Further, the CAI can easily be used by clinicians due to ease of administration and interpretation of ratings. In fact, the CAI has definitions of cognitive domains (e.g., working memory), obligatory questions, and anchor point definitions for six domains of cognitive functioning. Also, for multi-site international trials, the CAI was found to be one of the most easily translatable and culturally adaptable co-primary assessment measures (Gonzalez et al., 2013) and has been translated into Japanese, Turkish, Indonesian, Italian, and Spanish.

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Table 1.

Demographic Information for the First Episode Patients and Controls, and Chronic Patients and Controls Collected at Study Entry

	First Episode Patients (n=60)	First Episode Controls (n=35)	*t* or χ^2 value, p value	Chronic Patients (n=38)	Chronic Controls (n=19)	*t* or χ^2 value, p value
Age (*M, SD)* years	21.9 (3.43)	22. (2.89)	−0.59, .55	30.3 (7.01)	33.7 (3.58)	−1.99, .05
Gender (% Male)	43 (71%)	17 (52%)	3.3, .07	26 (68%)	11 (58%)	.6, .43
Education (*M, SD)* years	12.6 (1.58)	13.8 (1.49)	−3.60, .01	14.0 (2.05)	14.4 (1.71)	−0.82, .42
Parental Ed (*M, SD)* years	14.5 (4.36)	14.1 (2.30)	0.47, .64	14.8 (3.33)	14.3 (2.26)	0.67, .51
Marital Status			.2, .66			.6, .74
Single	59 (98%)	34 (97%)		32 (84%)	14 (88%)	
Married	0 (0%)	0 (0%)		4 (11%)	1 (6%)	
Divorced	1 (2%)	0 (0%)		1 (3%)	1 (6%)	
Separated		1 (3)				
Ethnicity (% Hispanic)	28 (46%)	17 (48%)	0.1, .81	11 (29%)	7 (32%)	.0, .84
Race			5.8, .45			4.9, .43
Caucasian	30 (51%)	20 (55%)		15 (40%)	6 (32%)	
Asian	2 (3%)	1 (3%)		3 (8%)	1 (6%)	
Native American	0 (0%)	2 (6%)		1 (3%)	0 (0%)	
African American	14 (23%)	6 (18%)		12 (32%)	6 (32%)	
Mixed	13 (21%)	5 (15%)		5 (13%)	6 (32%)	
Pacific Islander	1 (2%)	1 (3%)		2 (5%)	0 (0%)	
Diagnosis						
Schizophrenia	37 (61%)	N/A		31 (82%)	N/A	
Schizoaffective	3 (5%)			6 (16%)		
Schizophreniform	21 (35%)			1 (1%)		
Months since psychosis onset (M, SD)	7.7 (6.52)	N/A	-	N/A	N/A	-
Informant Relationship						
Mother	23 (39%)	4 (12%)		14 (36%)	0 (0%)	
Father	2 (3%)	1 (4%)		3 (8%)	0 (0%)	
Sibling	7 (13%)	6 (16%)		9 (22%)	3 (16%)	
Other Relative	3 (5%)	2 (5%)		3 (8%)	0 (0%)	
Friend	0 (0%)	9 (28%)		1 (3%)	9 (47%)	
Case Manager	22 (36%)	N/A		0 (0%)	N/A	
Significant Other	3 (5%)	7 (20%)		5 (14%)	4 (21%)	
Refused consent for informant or missing	0 (0%)	6 (16%)		3 (8%)	3 (16%)	
Informant Age (*M, SD)*	36.1 (17.7)	31.0 (12.08)		47.3 (14.2)	35.7 (7.4)	
Informant Education (*M, SD)*	18.0 (5.68)	14.36 (1.34)		13.78 (2.6)	15.4 (1.6)	
Duration of Interview Patient (*M, SD)* minutes	14.6 (3.67)	13.1 (3.33)		17.7 (9.3)	13.3 (4.8)	
Duration of Informant Interview (*M, SD)* minutes	15.8 (4.93)	10.2 (3.55)		13.9 (3.6)	10.1 (3.7)	

Table 2.

Group Differences in Cognition between First Episode Patients (n = 60) and Healthy Controls (n = 35), and Chronic Patients (n = 38) and Healthy Controls (n = 19)

Measure of Cognition	M (SD)	t-score, p value	Effect Sizes *d*
CAI Rater score			
First Episode Patients vs	3.62 (0.92)	13.49, < .01	2.87
First Episode Controls	1.26 (0.61)		
Chronic Patients vs	3.24 (1.30)	5.67, <.01	1.61
Healthy Controls	1.42 (0.69)		
MCCB - Composite			
First Episode Patients vs	28.50 (13.82)	6.19, <.01	1.45
First Episode Controls	46.56 (8.84)		
Chronic Patients vs	35.79 (16.12)	2.51, .02	0.76
Chronic Controls	47.81 (14.94)		

Table 3.

Correlations between the CAI and Neurocognition, Functional Outcome, and Symptoms in Patients (n = 99)

	Patient	Informant	Rater	MCCB	UPSA	RFS Total	Work/ School	Independent Living	Family	Social
CAI Patient	-									
CAI Informant	.82**	-								
CAI Rater	.94**	.93**	-							
MCCB	−.54**	−.57**	−.60**	-						
UPSA	−.48**	−.54**	−.56**	.77**	-					
Role Functioning Scale –Total	−.44**	−.52**	−.54**	.58**	.47**	-				
Work / School	−.47**	−.48**	−.53**	.61**	.47**	.87**	-			
Independent Living	−.36**	−.47**	−.45**	.48**	.40**	.88**	.71**	-		
Family Relationships	−.30**	−.33**	−.36**	.38**	.27*	.75**	.50**	.59**	-	
Social Relationships	− 35**	−.47**	−.46**	.47**	.42**	.88**	.66**	.68**	.55**	-