Published in final edited form as:

Biol Psychiatry. 2008 March 1; 63(5): 505–511.

Predicting Schizophrenia Patients' Real World Behavior with Specific Neuropsychological and Functional Capacity Measures

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Abstract

Background—Significant neuropsychological (NP) and functional deficits are found in most schizophrenia patients. Previous studies have left question as to whether global NP impairment or discrete domains affect functional outcomes, and none have addressed distinctions within and between ability and performance domains. This study examined the different predictive relationships between NP domains, functional competence, social competence, symptoms, and real world behavior in domains of work skills, interpersonal relationships, and community activities.

Methods—222 schizophrenic outpatients were tested with an NP battery and performance-based measures of functional and social competence and rated for positive, negative, and depressive symptoms. Case managers generated ratings of three functional disability domains.

Results—Four cognitive factors were derived from factor analysis. Path analyses revealed both direct and mediated effects of NP on real world outcomes. All NP domains predicted functional competence, but only processing speed and attention/working memory predicted social competence. Both competence measures mediated the effects of NP on community activities and work skills, but only social competence predicted interpersonal behaviors. The attention/working memory domain was directly related to work skills, executive functions had a direct effect on interpersonal behaviors and processing speed had direct effects on all three real world behaviors. Symptoms were directly related to outcomes, with fewer relationships with competence.

Conclusions—Differential predictors of functional competence and performance were found from discrete NP domains. Separating competence and performance provides a more precise perspective on correlates of disability. Changes in specific NP or functional skills might improve specific outcomes, rather than promoting global functional improvement.

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Financial Disclosures: Dr. Bowie has been a paid consultant to Pfizer, Inc. and received grant support from Pfizer, Inc. and Janssen, LTD. Dr. Harvey is a consultant for Pfizer, Inc., Janssen Medical Affairs, Sanofi-Aventis, Astra-Zeneca, Abbott Labs, Memory Pharmaceuticals, and Merck, Inc; he is on the advisory board for Eli Lilly and Forest Laboratories; he has received grant support from Bristol Myers Squibb. Drs. Leung, Reichenberg, McClure, Heaton, and Patterson have no financial disclosures.

Introduction

As the goals of treatment of schizophrenia broaden from symptom management to improving real world outcomes, an increasing number of studies are examining the determinants of real world functional status. The most robust and replicated finding is that global neuropsychological (NP) status is significantly associated with deficits in many real world functional domains, with evidence for significant relationships between specific cognitive and functional domains (1,2). Other work has failed to demonstrate relationships that are domain-specific, suggesting that global cognitive functioning predicts global functional outcome (3–7).

Further evidence that functional skills are correlated with NP performance comes from a study by McClure et al. (8), which examined the specificity of the relationship between different NP domains and performance-based measures of social and living skills. Two canonical roots were found to be differentially associated with levels of functional capacity, such that a root loading on processing speed, episodic memory, and executive functions was associated with everyday living skills, while a root loading on working and episodic memory, and verbal fluency was associated with social competence. However, although the McClure findings suggested that two domains of functional capacity (i.e., social and living skills) have different neuropsychological correlates, this study is limited in that real world performance, or actual outcome, was not explored. To date, few studies have examined how specific NP domains relate to functional outcome measures when various possible mediating factors are considered.

We recently examined the complex relationship between NP performance and real world functional status by considering functional capacity measures as mediators of this relationship (9). Results suggest that global NP performance is related to performance across multiple real world functional domains, including participation in community activities, interpersonal functioning, and work skills, though this relationship was largely mediated by functional capacity scores. Thus, patients with better overall neurocognitive skills are likely to have greater functional capacity and subsequent better outcomes, with some evidence of direct relationships between NP and RW outcomes. Moreover, negative and depressive symptoms were also associated with RW outcomes, but this relationship was independent of functional capacity and NP scores.

The purpose of this report is to expand on our previous findings (8,9) by examining the relationship of specific, rather than one global, NP domains with separate domains of real world outcomes, as well as their potential mediation by discrete aspects of functional capacity, including both everyday living skills and social competence. We used NP domains that emerged from exploratory factor analysis, two measures of functional capacity, the University of California, San Diego, Performance-Based Skills Assessment (UPSA; 10) and the Social Skills Performance Assessment (SSPA; 11). Our measures of real world behavior came from the Specific Level of Function Scale (SLOF; 12) Community Activities, Interpersonal Skills, and Work Skills subscales. The patterns of direct and indirect influence between NP domains, functional capacity and various domains of real world performance were examined with confirmatory path analyses. Variables that could influence these relationships, including the current severity of positive and negative symptoms and symptoms of depression were also examined in these models, as these symptomatic variables were previously shown to predict real world outcome independent of the competence measures (9). Based on previous findings, we hypothesized that NP domains would have both direct and mediated effects on the outcomes and that symptoms would have only direct effects.

Method

Subjects

Subjects were older schizophrenia outpatients enrolled in a longitudinal study of the course of cognitive and functional status. 78 subjects in this study were part of our previously published report (9). Exclusion criteria consisted of a primary DSM-IV (13) Axis I diagnosis other than schizophrenia or schizoaffective disorder, Mini-Mental Status Examination score below 18, WRAT Reading grade-equivalent of grade 6 or less, or any diagnoses in a patient's chart of a medical illnesses that might interfere with the assessment of cognitive functioning, including epilepsy, traumatic brain injury, cerebrovascular accident, or multiple sclerosis. All subjects met diagnostic criteria for schizophrenia or schizoaffective disorder (13). The Comprehensive Assessment of Symptoms and History (CASH; 14) was completed by a trained research assistant and diagnosis was confirmed by a senior clinician. Patient data were used only if they were receiving case management services. Subjects were required to have evidence of continued illness at the time of recruitment, as evidenced by meeting at least one of three criteria: 1). Inpatient admission for psychosis in the past two years; 2). Emergency room visit for psychosis in the past two years; or 3) A score on the PANSS positive symptoms items delusions, hallucinations, or conceptual disorganization of 4 (moderate) or more. Outpatient status was defined as living outside of any institutional setting, including a nursing home. Recruitment was conducted at clinics at Veteran's Affairs Hospitals, a New York State Psychiatric Hospital, or Mount Sinai School of Medicine.

Case managers were informants for the real-world functional status ratings, leading to the exclusion of 29 patients who completed other aspects of this assessment but who did not have a case manager to rate performance. All patients were receiving treatment with antipsychotic medications at the time of assessment. All subjects signed a written informed consent form approved by the institutional review board at each research site, after the testing procedures were fully explained.

Measures

All subjects completed the tests in a fixed order. Screening measures were of global cognition with the Mini-Mental State Examination (15) and estimated premorbid functioning with the Wide Range Achievement Test, 3rd Edition Recognition Reading subtest (16). These measures were followed by functional skills assessment, a cognitive test battery, and a symptom interview. Examiners received extensive training in performing assessments and every three months their performance was evaluated through re-rating of training tapes, dual-ratings of the functional status measures with the first author, and quality assurance assessments of all testing. These raters were trained to adequate reliability on symptom ratings with two full days of training, four standardized video tapes and in-person interviews that yielded Intraclass Correlation Coefficients from .86 to .92.

Performance-based Measures of Functional Capacity—The UCSD Performance-Based Skills Assessment Battery (UPSA; 10) is designed to directly assess functional skills competence among the severely mentally ill. This test was designed for older outpatients and measures performance in a number of domains of everyday functioning through the use of props and standardized skills performance situations. In this study, four derived domains of the UPSA were used. The Comprehension/ Planning domain measures the patient's ability to comprehend written material that describe recreational outings and then plan the activities and list appropriate items necessary to bring to the outings. In the Finance domain, the patient must count out given amounts from real currency, make change and fill out a check to pay a utility bill. The Communication domain involves a series of role-play situations that require the patient make emergency calls, call directory assistance to request a telephone number, call the number,

and then reschedule a medical appointment. In the Transportation/Mobility domain, patients use information from bus schedules and maps to determine appropriate fare, state telephone numbers to answer relevant questions, decide which map to use to get to a certain location, and determine the appropriate route and transfers to reach a destination. The UPSA total score was used as the dependent variable. Note that we developed locally specific measures for transportation/mobility and comprehension/planning, as the initial version of the UPSA had items based on local San Diego activities. We also excluded the household chores subtest, because the analogue kitchen required was not portable enough to be used at field sites. These modified versions were used in our previous reports with the UPSA (8,9,18).

The Social Skills Performance Assessment (SSPA; 11) is a measure of social skills that was created for use with schizophrenia patients. After a brief practice, the patients initiate and maintain a conversation for three minutes in each of two situations: greeting a new neighbor and calling a landlord to request a repair for a leak that has gone unfixed. These sessions were audiotaped and scored by a trained rater who was unaware of diagnosis (patient or healthy control) and all other data. Dimensions of social skills scored include fluency, clarity, focus, negotiation ability, persistence, and social appropriateness. These raters were trained to the gold standard ratings of the instrument developers (ICC = .86) and high inter-rater reliability was maintained at three months (ICC=.87). The mean of the ratings on these variables across the two measures was used in this study.

Cognitive Assessment—Patients completed a comprehensive assessment of the cognitive ability areas previously shown to be most consistently correlated with functional skills (1). The following variables were used: category fluency (animal naming) (18), phonological fluency (FAS) (18), Wisconsin Card Sorting Test 64-card computerized version (WCST; 19) total errors, Trail-making test parts A and B (20), the Digit Span Distraction Test (21), the CERAD Constructional Praxis test (22), the Rey Auditory Verbal Learning Test (RAVLT; 22) learning trials 1–5, RAVLT short delay free recall, and recognition, and the Wechsler Adult Intelligence Scale, 3rd edition (WAIS-III; 23) digit span, digit symbol, and letter-number sequencing subtests.

Symptom Assessment—Severity of schizophrenia symptoms was assessed using the Positive and Negative Syndrome Scale (PANSS; 24). This is a 30-item scale with seven items measuring positive symptoms, seven items measuring negative symptoms, and sixteen items measuring general aspects of psychopathology and is completed after a structured interview. We used the positive and negative domains from the empirically derived 5-factor model of the PANSS that was developed by White et al. (25). We obtained self-reports of depression from the patients using the Beck Depression Inventory-second edition (BDI-II; 26).

Real-world Functional Performance—In order to examine real world functional performance, the Specific Level of Function Scale (SLOF) was employed. This scale is a 43-item observer-rated report of a patient's behavior and functioning on the following domains: Interpersonal Relationships (e.g., initiating, accepting and maintaining social contacts; effectively communicating), Participation in Community Activities (e.g., shopping, using telephone, paying bills, use of leisure time, use of public transportation), and Work Skills (e.g., employable skills, level of supervision required to complete tasks, ability to stay on task, punctuality). Note that the Work Skills domain comprises behaviors important for vocational performance, but is not a rating of behavior during employment. The latter would not be feasible since the majority of our patients are unemployed, the proxy measure of work skills from the SLOF is used. Ratings by the third-party informant are made on the basis of the amount of assistance required to perform real-world skills, or frequency of the behavior. For all subjects in this study, a caseworker or other clinician for the patient completed the SLOF in order to obtain information on real-world performance. All informants indicated that they knew the

patient at least “very well” on the SLOF’s 5-point Likert scale. The scale has excellent interrater reliability, factorial validity, and internal consistency (12) and has been previously shown to be related to NP performance and scores on functional capacity measures (9,27).

Case managers who rated the SLOF were unaware of the subject’s performance on any cognitive or performance based measures or the symptom ratings. Interviewers completed and scored all aspects of assessment independently of the case managers’ SLOF ratings.

Statistical Analyses

Factor Analysis—Factor analysis was used to generate cognitive factor scores using principal axis factoring. The following variables were entered as raw scores: WCST Total Errors, Trail Making Test parts A and B time to completion, DSD Distraction proportion correct, DSD Non-distraction proportion correct, Digit Span Forward and Backward scores, Digit Symbol total, Letter Number Sequencing total, RAVLT Total Learning, RAVLT Short Delay, RAVLT Long Delay, RAVLT Recognition Correct Responses, Phonological Fluency total unique responses, Category Fluency total unique responses, Praxis total score. Note that the data presented in Table 1 are age-corrected t-scores (mean=50, SD=10) from normative data (18–23), which index the degree of impairment. Raw scores were used in the analyses. Factors with eigenvalues over 1 were extracted and a varimax rotation to the resulting factor structure was applied. Factor scores were produced with the Anderson-Rubin method, which ensures orthogonality of the factor scores.

Path Analysis—Testing of the direct and indirect predictors of the performance domains was achieved with confirmatory path analyses. Based on previous research (8,9), we predicted that the four cognitive domains, the empirically-derived positive and negative symptom domains, and the total score from the BDI as exogenous variables would predict each of the real world outcome domains. In this study, two competence measures, the UPSA (*living skills*) and SSPA (*social competence*) were hypothesized as mediating endogenous variables. The real world outcome variables were case manager-rated performance on Interpersonal Behavior, Work Skills, and Community Activities. Physical Functioning, Self-Care, and Socially Acceptable Behavior were not modeled due to ceiling effects on these measures in the present sample of community-dwelling patients.

The final models were developed through an iterative procedure in which the non-significant paths with the smallest contribution were sequentially eliminated from a saturated model (in which all variables are correlated) until the best-fitting model was identified, defined by three different goodness of fit statistics, the model chi-square, the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). A good fitting model is reflected by non-significant chi-square tests, a CFI of greater than 0.90, and an RMSEA less than .08. The chi-square test is a comparison of the observed covariance matrix to the covariance matrix of the final model. The CFI compares the final model to an “independence model” and indicates the percent to which covariation in the data are replicable. The independence model is a null model that assumes that all variables are uncorrelated with the dependent variable. The RMSEA is a model fit procedure that accounts for model complexity, thus promoting the most parsimonious model, by controlling for degrees of freedom. All analyses were performed using SPSS, version 14 and its affiliated software, AMOS.

Results—In these analyses, 222 patients were assessed with all instruments, and had case manager reports on the SLOF. Demographic and performance data are presented in Table 1.

Four factors emerged from the analysis and were named based on the theoretical constructs of the tests that had the highest loading. See Table 2 for the rotated factor loadings.

All three models of the outcomes had excellent fit, with the final model superior to the independence model (see table 3). In these models, there were no significant correlations among the endogenous variables (the four cognitive factors and the three symptom domains). In all models, higher negative symptom severity predicted poorer social competence, but no other symptom variables predicted either competence measure. The attention/working memory and processing speed factors predicted both social and living skills competence, while verbal memory and executive functions predicted living skills, but not social competence. Specific direct and indirect effects were found for each outcome behavior.

Interpersonal Behavior (see figure 1) was directly predicted by social, but not living skills, severity of depressive symptoms, processing speed, and executive functions. Negative symptoms predicted interpersonal behavior both directly and through its effects on social competence. Positive symptoms and verbal memory did not contribute to the model, while attention/working memory predicted interpersonal behavior through its effect on social competence.

Community Activity Participation (see figure 2) was directly predicted by both social and living skills competence and the severity of positive symptoms. In this model, the processing speed factor predicted community performance directly and indirectly through its effects on both social competence and living skills. Severity of negative symptoms related to poorer performance through its relationship with social competence. Verbal memory and executive functioning influenced community activity through their relationship with living skills. Depression did not contribute to participation in community activities.

Work Skills (see figure 3) are directly predicted by severity of depressive and positive symptoms as well as both social competence and living skills. As in the other two models, processing speed made both a direct contribution to work skills as well as indirect effects through social competence and living skills. The attention/working memory, verbal memory, and executive functioning factors made indirect contributions through relationships with living skills and/or social competence.

Discussion

Cognitive impairment is a core feature of schizophrenia which is associated with the functional disabilities that have proven resistant to treatment. Similar to our previous findings (9), with a smaller, but overlapping sample, this study reveals complex relationships between cognitive abilities and functional outcomes. By modeling different behaviors (work skills, interpersonal, community activities), the same cognitive skill may relate to performance directly or through its relationship with living skills and/or social competence, which similarly have specific relationships depending on the outcome domain. Certain cognitive abilities appear important for the acquisition of social or living skills, while others may also be important for deployment of these skills in real time in the real world. Verbal memory and executive functions appear important for functional competence, but not necessarily for social skills. Processing speed, as well as attention and working memory are related to both social and functional competence. Moreover, processing speed predicts work skill, interpersonal functions, and community behaviors independently of its relationship with everyday living skills. Attention/working memory and executive skills also have direct effects on work and interpersonal behavior, respectively. The strength and independence with which each NP domain contributes to outcome depend on which of the outcome domains is assessed.

These direct and mediating effects have real world implications. For example, it is interesting to note that executive functioning's effect on community activities and work skills is mediated by living skills, as assessed by the UPSA, but executive functions directly relate to real world

interpersonal behavior. Executive functions encompass reasoning, problem solving, and mental flexibility; thus, it logically follows that they would be important for guiding behavior during dynamic interpersonal interactions.

In contrast to recent work using confirmatory factor analyses that suggested schizophrenia is characterized by a unitary cognitive impairment (28,29), we found evidence for distinct cognitive domains using principal axis factoring, similar to other work using confirmatory path analysis (30) and empirical literature review (31). The divergence between these findings may reflect differences in samples, NP assessment methods, or other issues. It is important to keep in mind that NP instruments produce variables that have overlapping features; our discussion of distinct cognitive domains does not presume, for example, that attention and processing speed are not critical to performance on tasks of verbal memory or executive skills. More importantly, the present results suggest that it is critical to examine individual cognitive skills because these domains relate to real world functional behaviors in different ways and thus might represent separable treatment targets.

Our findings extend the argument for considering processing speed impairments as a core cognitive deficit in schizophrenia. From a theoretical perspective, processing speed and its cognitive components underlie performance on other cognitive domains and is likely to be essential learning and executive functions. A recent meta-analytic study by Dickinson et al (32) found that the digit symbol task, a measure of processing speed, represented the greatest deficit among cognitive abilities in individuals with schizophrenia and in their unaffected relatives, making it a candidate endophenotype. The WAIS technical manual (33) describes the processing speed index as the most sensitive in schizophrenia patients. In the CATIE baseline cognition analyses (28), processing speed, indexed by the digit symbol task, accounted for substantial variance (~65%) in overall cognitive performance and was the best single predictor of the total score. In the present study, the processing speed factor, which included the digit symbol task, consistently predicted social competence and living skills and was the only factor to have a direct effect on all three real world behaviors. This finding is not simply a measurement artifact, as the severity of impairment on the processing speed measures was comparable to that observed on variables in the other NP domains. Thus, processing speed is a core cognitive feature, underlies performance on other cognitive domains, and is essential for skill acquisition and for the deployment of those skills in everyday functional performance. Taken together, these findings support the study of remediating processing speed in schizophrenia patients as a means for improving skill acquisition and outcomes.

An explosion of pharmacological and behavioral treatments have been proposed in the past 10 years to treat cognitive dysfunction in schizophrenia, culminating in the MATRICS initiative, which sought to bring together academia, the pharmacological industry, and the Food and Drug Administration in an effort to streamline approval for treatments of cognitive dysfunction. The impetus for this work is the well-replicated finding of substantial zero-order correlations between cognition and functional outcomes, which provided a target, in cognitive dysfunction, for promoting functional recovery in schizophrenia. The present findings, making use of path analysis to model intercorrelations between and within symptom, cognitive and functional domains, suggest that cognitive remediation might be viewed as an initial step in promoting functional recovery. Cognition was consistently associated with competence in living skills and social functioning, but its relationship with actual performance in the real world was largely mediated by these latter abilities. Although cognition is correlated with functional and social abilities, skill acquisition in these domains might not directly mirror cognitive gains, as negative symptoms also affect social skills and the cognitive factors leave much of the variance in the two competence measures unexplained. Further, both traditional symptoms of schizophrenia and mood disturbance affect real world performance outcomes independent of the influences of these competence measures. To reduce disability and foster functional

recovery, it will be important to view cognitive remediation and enhancement as a platform upon which skills could be more easily taught and later generalized when facing dynamic social and occupational demands. Since negative and depressive symptoms might be rate limiting factors even with cognitive and functional skill attainment, it is critical to assess and treat these symptom domains. An encouraging recent study (34) suggests that even modest gains in cognitive performance with second generation antipsychotic treatment account for significant improvements in performance-based social skills, but also that social competence was more responsive to treatment than cognitive performance. It will be interesting to see whether longer-term trials incorporating broad efforts to remediate cognitive dysfunction, cultivate and encourage deployment of skills, and reduce negative and depressive symptoms lead to reduction in disability.

Addressing the limitations of the present study would provide several avenues for future research. These baseline findings are part of a longitudinal study, which will be better able to address the issue of causality in examining the interrelationships between cognition, symptoms, skills, and outcomes. Cross-validation of these findings will be important, particularly because we did not make specific *a priori* hypotheses regarding the interrelationships. We did not use three domains of the SLOF due to ceiling effects. This sample of stabilized community living patients did not display deficits in the areas of physical functioning, self-care, or socially acceptable behavior. Older, more chronically psychotic patients tend to have poorer basic self-care, while acutely psychotic patients might be examined to find predictors of socially unacceptable behavior. Indeed, the heterogeneity in illness presentation and in degree of disability in schizophrenia might suggest that different patterns of interrelationships would be found in other samples. It will also be interesting to develop novel methods for examining real world behaviors to assess whether they are interrelated or hierarchical. Since the rates of employment in schizophrenia in general and this older sample in specific are very low, we examined skills that are important for vocational success, rather than occupational status or performance during work as an outcome. Future studies, particularly with younger samples, can make use of instruments, such as the COMPASS system (35) that assess work readiness and performance. Prediction of actual vocational performance is increasingly important as multiple investigators have reported behavioral treatments that improve vocational success (36,37,38). Several external factors, not the subject of this study, are also likely to affect models of functional outcome, particularly at the post-competence level. For example, social stigma, lack of social support, and financial resources might be barriers between skill competence and real world performance (39). Recent reports of the mediating effects of social cognition (40) and personality (41) are clearly important to evaluate in subsequent studies.

Acknowledgements

This research was supported by NIMH Grant Number MH 63116 to Dr. Harvey, the Mt. Sinai Silvio Conte Neuroscience Center (NIMH MH 36692; KL Davis PI) and the VA VISN 3 MIRECC. The authors thank Hannah Anderson, Kushik Jaga, and Brooke Halpern for assistance with data collection and technical aspects of the report preparation.

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Figure 1.
Prediction of Real World Interpersonal Behavior

Figure 2.
Prediction of Real World Participation in Community Activities

Figure 3.
Prediction of Real World Work Skills

Table 1

Demographic data, performance, and ratings

DOMAIN	VARIABLE	Mean	SD	Range
Demographic	Age	56.6	9.7	27–87
	Education (Years)	12.6	2.5	2–20
	% Living Independently	40.6		
	% Unemployed	59.4		
Symptom	PANSS Positive Sx Factor	13.5	5.1	7–31
	PANSS Negative Sx Factor	13.8	5.0	7–34
	Beck Depression Inventory	10.9	9.3	0–47
Functional Skills	UPSA Total Score	70.63	19.23	9.2–97
Social Skills	SSPA Rating	3.8	.75	1.3–5.0
Functional Performance (SLOF)	Interpersonal Relationships	27.7	4.7	14–35
	Community Activities	45.1	8.9	14–55
	Work Behaviors	21.9	5.2	6–30
	T-Scores			
Attention/Working Memory	Digit Span Forward	46.3	9.3	18.0–75.1
	Digit Span Backward	43.4	9.4	22.5–71.3
	DSD Distraction %	39.5	15.7	0–69.4
	DSD NonDistraction %	38.0	15.5	0–59.7
	Letter Number Sequencing	38.4	10.9	20–80
Verbal Memory	RAVLT Trials I–V	33.7	13.9	3.3–70.2
	RAVLT Long Delay Recall	35.5	12.2	4.8–70.6
	RAVLT Recognition Hits	35.4	19	0–61.5
Processing Speed	Trail Making Test, Part A (sec)	29.3	10.4	0–47.5
	Digit Symbol Coding	35.3	8.0	20–63.3
	Category Fluency	42.7	12.5	6.6–81.4
	Phonological Fluency	39.1	9.9	14.9–67.2
Executive Functioning	WCST Total Errors	33.3	9.5	9.3–59.3
	Trail Making Test, Part B (sec)	25.4	18.4	0–58.2
	Constructional Praxis	40.8	13.3	5.8–61

Table 2
 Rotated Matrix from Principal Axis Factoring Factor Analysis of Neuropsychological Variables

	Component			
	Attention/WM	Verbal Learning and Memory	Processing Speed	Executive Functions
DSD Distraction	.750	.141	.305	-.207
DSD Nondistraction	.819	.140	.305	-.077
Digit Span Forward	.733	.063	.104	.091
Digit Span Backward	.723	.159	.051	.333
Letter Number Sequencing	.505	.070	.324	.438
RAVLT Total Learning	.307	.752	.306	.154
RAVLT Long Delay Recall	.181	.818	.216	.152
RAVLT Recognition Correct	-.046	.803	.077	.057
Trail Making Test Part A	.091	.148	.600	.188
Digit Symbol	.269	.188	.753	.191
Semantic Fluency	.169	.237	.621	-.120
Phonological Fluency	.409	.072	.560	.045
WCST Total Errors	.050	.212	.067	.851
Trail Making Test Part B	.235	.229	.487	.600
Constructional Praxis	.273	-.111	.308	.366

Table 3
Fit Statistics for the Independence and Final Outcome Models

<i>Outcome Domain</i>	<i>Model</i>	Fit Statistic		
		Chi-Square (df), p-value	CFI	RMSEA (90%CI)
Interpersonal	Final Model	12.0 (13), p=.52	1.0	0.0 (0.0–0.06)
	Independence Model	170.2 (28), p<.001	0.0	.152 (0.13–0.17)
Community Activities	Final Model	17.8 (25), p=.85	1.0	0.0 (0.0–0.31)
	Independence Model	310.9 (45), p<.001	0.0	0.164 (0.14–0.18)
Work	Final Model	30.9 (31), p=.47	1.0	0.0 (0.0–0.05)
	Independence Model	284.0 (55), p<.001	0.0	0.137 (0.12–0.15)