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Self Assessment in Schizophrenia: Accuracy of Evaluation of Cognition and Everyday Functioning

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Abstract

Objective—Self-assessment deficits, often referred to as impaired insight or unawareness of illness, are well established in people with schizophrenia. There are multiple levels of awareness, including awareness of symptoms, functional deficits, cognitive impairments, and the ability to monitor cognitive and functional performance in an ongoing manner. The present study aimed to evaluate the comparative predictive value of each aspect of awareness on the levels of everyday functioning in people with schizophrenia.

Method—We examined multiple aspects of self-assessment of functioning in 214 people with schizophrenia. We also collected information on everyday functioning rated by high contact clinicians and examined the importance of self-assessment for the prediction of real world functional outcomes. The relative impact of performance based measures of cognition, functional capacity, and metacognitive performance on everyday functioning was also examined.

Results—Misestimation of ability emerged as the strongest predictor of real world functioning and exceeded the influences of cognitive performance, functional capacity performance, and performance-based assessment of metacognitive monitoring. The relative contribution of the factors other than self-assessment varied according to which domain of everyday functioning was being examined, but in all cases, accounted for less predictive variance.

Conclusions—These results underscore the functional impact of misestimating one's current functioning and relative level of ability. These findings are consistent with the use of insight-focused treatments and compensatory strategies designed to increase self-awareness in multiple functional domains.

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Keywords

schizophrenia; insight; cognition; metacognition; functional capacity

Poor insight is a well-documented feature of schizophrenia, including reduced awareness of having a mental disorder, need for treatment, and the consequences of the illness (Amador et al., 1994; Medalia & Thysen, 2010). Awareness of functional deficits a on the part of people with schizophrenia has consistently been found to be inaccurate compared to observations of high-contact clinicians and interviewers (Bowie et al., 2007; Durand et al., 2014; Johnson et al., 2011; Sabbag et al., 2011). There are multiple strategies for assessing real-world functioning, including rating scales completed by informants and patients (Leifker et al., 2011; Gould et al., 2012), direct observations by trained clinicians (Kleinman et al., 2009), and performance-based measures of the ability to perform everyday skills (Harvey et al., 2007). Multiple areas of everyday functioning are affected in people with schizophrenia, including deficits in social, vocational, and everyday activities domains, even during periods of remission from active psychosis (Leung et al., 2008). Self-reports of everyday functioning in schizophrenia often do not converge with objective evidence, including performance-based assessments of cognition or functional capacity (Bowie et al., 2007; Sabbag et al., 2011, Durand et al., 2014) or the reports of other evaluators (Patterson et al., 1997; McKibbin et al., 2004).

Three domains of impaired awareness have been documented including: clinical insight (often referred to as Unawareness of illness: Amador et al., 1993), cognitive insight, including cognitive distortions such as overgeneralizations (Beck et al., 2004), and neurocognitive insight or awareness of neuropsychological dysfunction (Medalia & Thysen, 2008; Burton et al, 2014 submitted). Some data suggest that having insight in one domain does not necessarily equate to insight in another domain (Medalia & Thysen, 2010). In a separate analysis of the present dataset, Burton et al. (2014, submitted) compared participants with and without neurocognitive impairment on self-report measures of awareness of cognitive difficulties, depression, positive and negative symptoms, and performance-based measures of executive functioning and functional capacity. The groups differed only with respect to positive symptoms and depression, in that depression and positive symptoms appeared to be associated with enhanced neurocognitive insight. Durand et al., (2014) also conducted an investigation of neurocognitive insight in this sample, but focused on self-reports of cognitive deficits as they related to reports of high contact clinicians. Similar to Burton et al. (2014, submitted), they also found that depression was associated with greater convergence between self-reported cognitive performance and clinician impressions.

One previous investigation found a relationship between the executive functioning measured by the Wisconsin Card Sorting Test (WCST) and cognitive insight, but no relationship between misestimation of cognitive functioning and other domains of neurocognition such as attention, memory and problem solving (e.g., Simon et al., 2009). Individuals with poorer neuropsychological (NP) functioning have been shown to underestimate their impairment and functional capacity across multiple neuropsychiatric conditions (e.g., Carone et al.,

2005, Spikman and van der Naalt, 2010). Koren at al. (2006) used an adaptation of the WCST to investigate metacognitive processing, including self-monitoring and self-regulation, finding that they were essential determinants of real world functioning and self-assessment (Koren et al., 2006). Further, Koren et al. (2004) found that metacognition was a mediator between cognitive deficits and misestimation of functioning, with measures of metacognition relating more strongly to the ability to self-assess as compared with traditional NP assessment measures.

The present study performed a wide-ranging examination of impaired self-assessment in schizophrenia, including everyday functioning, cognitive abilities, and contemporaneous assessment of accuracy of performance in a cognitive test. Previous studies have found that the range of abilities and symptoms in people with schizophrenia account for 50% or less of the variance in real-world functioning (Bowie et al., 2006; 2008); it is possible that mis-estimation of abilities and functioning could account for additional variance. We examined the association of impaired self-assessment and everyday functioning, beyond the influences of other determinants, such as NP performance and level of everyday functioning. We also examined whether contemporaneous self-assessment deficits underlie other self-assessment deficits. Such an investigation is even more important in light of previous research suggesting that metacognitive deficits can be targeted via psychotherapeutic interventions (i.e., Brune, Dimaggio, & Lysaker, 2011). We examined the discrepancies between self-report and informant judgments across three domains of everyday functioning: vocational function, interpersonal skills, and everyday activities, as well as the discrepancy between self-assessed and informant-rated cognitive performance. If metacognitive impairment (impairment in the ability to perform contemporaneous judgments of adequacy in the performance of cognitive tests) is a primary predictor of self-assessment of everyday functional skills, it would be expected that impairments in this domain would add to the influences of previously identified determinants of impaired self-assessment.

Method

Participants

This research is part of the VALERO 2 study, which aimed to identify best methods for rating everyday functioning in individuals with schizophrenia and to identify potential determinants of impaired self-assessment (Harvey et al., 2011). The study participants included outpatients with schizophrenia (n=214) residing in Atlanta, Miami, or San Diego. Two informants were interviewed for each study participant: a high-contact clinician (case manager, psychiatrist, therapist, or residential facility manager) and a friend or relative. All research participants and informants provided signed, informed consent, and the study was approved by appropriate local IRBs in Miami, Atlanta, and San Diego. Participants in Atlanta were recruited at a psychiatric rehabilitation program (Skyland Trail). In Miami, they were recruited from the outpatient population at the University of Miami Medical Center. In San Diego, participants were recruited from the UCSD Outpatient Psychiatric Services clinic, a large public mental health clinic, and other local community clinics and by word of mouth. Table 1 presents the demographic and clinical characteristics of the sample.

All participants were administered a structured diagnostic interview, the Mini International Neuropsychiatric Interview, 6th Edition (MINI; Sheehan et al., 1998) by a trained interviewer. All diagnoses were subjected to a consensus procedure at each site. Participants were excluded for a history of traumatic brain injury with unconsciousness >10 minutes, brain disease including seizure disorder or neurodegenerative condition, or the presence of another DSM-IV diagnosis that would exclude the diagnosis of schizophrenia. None of the participants were experiencing their first psychiatric episode. Comorbid substance use disorders were not an exclusion criterion, in order to capture a broad array of individuals with schizophrenia, but participants who appeared intoxicated were rescheduled. Inpatients were not recruited. Participants resided in a wide array of unsupported, supported, or supervised residential facilities. Informants were not screened for psychopathology or substance abuse.

Procedure

All participants were examined with a performance-based assessment of metacognition, neurocognitive abilities, and functional capacity. Participants and informants also provided reports of social, everyday activities, and vocational functioning by completing a series of questionnaires and interview-based procedures. Although there were two informants for each participant, a friend or relative or a high contact clinician, we used the high contact clinician ratings for this study because of previous evidence that they had greater validity in the VALERO I study (Sabbag et al., 2011). Informants received no training and had no information about any performance based, clinically rated, or self-reported data on the participants.

Measures

Clinical Symptom Ratings—The severity of positive and negative symptoms was rated with Positive and Negative Symptom Scale (PANSS; Kay, 1991), a 30-item scale. Participants self-reported the severity of depression with the Beck Depression Inventory-II (BDI-II; Beck et al., 1996), with scores presented in Table 2.

Neurocognition—We examined cognitive performance with a modified version of the MATRICS consensus cognitive battery (MCCB; Nuechterlein et al., 2008). For this study, we did not include the social cognition measure from the MCCB, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) because several recent meta-analyses (e.g., Fett et al., 2011; Ventura et al., 2013) found that social cognition measures are minimally correlated with neurocognitive test performance and that neurocognition and social cognition are associated with different outcomes. We calculated a composite score, an average of the 9 age-corrected T-scores based on the neurocognitive tests in the MCCB, using the MCCB normative program, as our critical dependent variable.

Functional Capacity—As a functional capacity measure, we administered the brief version of the UCSD Performance-based Skills Assessment (UPSA-B; Mausbach et al., 2007). The UPSA-B is a measure of functional capacity, wherein participants are asked to perform everyday tasks related to communication and finances. The Communication subtest involves role-play exercises using an unplugged telephone (e.g., making an emergency call;

dialing a number from memory; calling to reschedule a doctor's appointment). During the Finance subtest, participants read a utility bill, count change, and write a check to pay a bill. The UPSA-B requires approximately 10 minutes. A total score is calculated from raw scores and ranges from 0-100, with higher scores indicating better functional capacity.

Real-World Functional Outcomes—As previously reported in the initial phase of the VALERO study, everyday functioning rated with multiple rating scales was correlated with neuropsychological and functional capacity performance (Harvey, Raykov, et al., 2011). The best rating scale determined by its relationship with ability measures was the Specific Levels of Functioning (SLOF; Schneider and Struening, 1983) scale, a self- or informant-rated report of functioning in Interpersonal Relationships (e.g., initiating, accepting and maintaining social contacts, effectively communicating), Participation in Community and Household Activities (shopping, using the 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, completes tasks, punctuality). The SLOF's Physical Functioning, Self-Care, and Socially Acceptable Behavior subscales were not used in the VALERO study. Patients were interviewed by a rater and informants completed the scale as questionnaire.

Metacognition—Using a metacognitive adaptation of the Wisconsin Card Sorting Test (Koren et al., 2004; 2006), we examined subjects' abilities to evaluate the accuracy of their neuropsychological performance and to quantify their metacognitive abilities. We administered the Wisconsin Card-Sorting Test (64-card version) and asked subjects to rate on a 100-point scale their confidence in the correctness of each response and to decide whether they wanted the response to count toward their total score. Thus, performance can be split into domains of accuracy (correct sorts), appraisal (average confidence for correct and incorrect sorts), and judgment (proportion of responses "offered" as correct as a function of actual accuracy).

In this study, accuracy and global monitoring were the dependent variables due to their previously manifesting the strongest and most consistent correlations with everyday functioning. Accuracy is the number of correct responses. Global monitoring is the total number of correct sorts the participant asks to be counted minus the incorrect sorts that they ask to be counted, indexing the participants' sense of their own knowledge level. The combination of these metacognitive indicators provides moment-to-moment performance data on metacognitive insight.

Self-reported and Interviewer Rated Cognitive Functioning—Both patients and high contact clinicians completed the Cognitive Assessment Inventory (CAI; Ventura, et al., 2013). The CAI is a 10-item instrument, which asks the participant to rate the severity of impairments in a variety of cognitive domains. Ratings are generated with on a 6-point (1-6) scale: a score of 1 indicates the least impairment, and a score of 6 represents most impairment. The patient was asked the questions in a standard interview format. Clinicians completed the form by themselves using the same instructions that the interviewer provided to the patients to rate the patient's level of cognitive impairment. For this analysis, we calculated a total score for the clinician and self-reports on the CAI. We previously reported

that scores on the CAI were uncorrelated between patient and clinician appraisals and that clinician ratings were significantly correlated with MCCB performance, while self-reported performance on the CAI was uncorrelated with the MCCB (Durand et al., 2014).

Results

Table 1 presents descriptive information on the patient sample. Also presented in Table 1 are all of the predictor variables, including the UPSA-B, modified MCCB, BDI-II, PANSS negative symptoms, metacognitive measures from the adapted WCST, and CAI scores. Table 2 presents informant ratings and difference scores for the three subscales on the SLOF (interpersonal functioning, everyday activities, and vocational functioning), with informant-based SLOF scores and CAI scores subtracted from the patient self-reported SLOF and scores. This subtraction procedure leads to **higher** scores on SLOF difference scores reflecting participant impressions of less impairment than seen by their clinicians, while **lower** scores on the CAI difference scores reflect participant impressions of less impairment on cognition measured by the CAI compared to their clinician raters.

Distributions

We examined the distributions of discrepancy scores because we wanted to examine normality of the distributions and to ensure that inaccurate self-assessment included both over and under-estimation of performance compared to the clinician reference points. None of the four difference scores had significant kurtosis or skewness. Although there was a general tendency toward participant underestimation of impairment across all three functional domains and for cognition, a substantial proportion of participants accurately estimated their functioning and an additional proportion of participants underestimated their performance compared the clinician ratings. For example, for work skills, 33% of the participants rated their performance equivalent to or poorer than their clinicians; this proportion was 47% for everyday activities and 44% for social functioning. Thus, slightly more than half of the participants overestimated their everyday functioning. For the CAI, 40% of participants reported their functioning to be equivalent to or worse than interviewer ratings. Thus, although over-estimation was more common, the difference scores were not unidirectional.

Correlations with Real World Functioning

Next, we computed Pearson correlations between the predictor variables, including clinician CAI ratings, and the clinician informant SLOF scores. As can be seen in Table 3, there were consistent correlations between clinician ratings of vocational functioning, everyday activities, and interpersonal relationships and all of the performance-based predictor variables, with only two correlations failing to reach statistical significance (both involving interpersonal functioning).

Correlations with Self-Assessment of Everyday Functioning

In the next analyses, we examined the intercorrelation between indicators of accuracy of estimation of current functioning. For these analyses, we used the CAI discrepancy scores as predictors. These correlations are presented in the bottom of table 3. Greater mis-estimation

of vocational functioning was significantly correlated with the greater mis-estimation of cognitive functioning, poorer metacognition/global monitoring, and lower depression scores. Greater misestimation of activities was significantly correlated with the greater mis-estimation of cognitive functioning, poorer global NP performance and lower depression scores. Greater misestimation of social functioning was significantly correlated with the greater misestimation of cognitive functioning, poorer global monitoring and reduced accuracy, and poorer functional capacity.

Regression Models

We then calculated simultaneous entry linear regressions as a test to confirm an overall relationship between real-world functioning and the following predictors: neuropsychological functioning (NP) as indexed by overall performance on the MCCB, performance on the UPSA-B, neurocognitive insight as determined by patient and interviewer discrepancies on the CAI, and metacognitive performance as indexed by accuracy and global monitoring on the adapted WCST. The models were significant for all 3 analyses, all $F>8.47$, all $p<.001$.

Based on the results of the simultaneous regressions, stepwise entry regressions were calculated to ascertain the importance of the different predictors of everyday functioning. These results are presented in the top of Table 4. When vocational functioning was examined, UPSA performance predicted 11% of the variance within the model, with the self-assessment discrepancy scores on the CAI predicting an additional 7% of the variance. Metacognitive performance on the WCST contributed an additional 4% of the variance. When social functioning was examined, self-assessment discrepancy scores on the CAI predicted 12% of the variance within the model and UPSA performance predicted 4% of the variance within the model, but metacognitive performance on the WCST did not enter the model. Similarly, when everyday activities were examined, the CAI discrepancy score predicted 17% of the variance within the model, and global NP performance predicted an additional 9% of the variance, but metacognitive performance did not enter into the model.

To test the idea that deficits in the contemporaneous monitoring of performance were the driver of more global self-assessment errors, we used a forced entry regression strategy. We entered the WCST accuracy and monitoring variables in the first step in a regression model, with UPSA scores and CAI self-assessment discrepancy scores entered in the second block, to predict each of the SLOF self-assessment discrepancy scores. When vocational functioning was examined via forced entry regression modeling, the two metacognitive performance variables on the WCST did not significantly enter the equation. However, the other factors (UPSA, Global NP and self-assessment discrepancy scores on the CAI) accounted for 18 % of the variance ($R^2=.18$, $F=11.18$, $p<.001$). However, when social functioning was examined, metacognitive performance measures predicted 6% of the variance within the model ($R^2=.06$, $F= 9.05$, $p<0.005$) and the other predictors (UPSA, Global NP and self-assessment discrepancy scores on the CAI) predicted another 19% of the variance within the model ($R^2=.25$, $F=12.44$, $p<.001$). With respect to everyday activities, the metacognitive measures predicted 3% of the variance within the model ($R^2=.03$, $F=1.94$,

p<.001), and the other predictors (UPSA, Global NP and self-assessment discrepancy scores on the CAI) accounted for an additional 22% of the variance (R^2=.25, F=15.82, p<.001).

The intercorrelations observed between different measures of self-assessment of functioning as indexed by interviewer/clinician and patient rating discrepancies on the CAI and SLOF indices were relatively high. Thus, an unrotated principal components analysis was conducted to create a global index of discrepancies in self-assessment of functioning using patient and interviewer discrepancies on the CAI and each of the three SLOF domains (social, vocational, and everyday activities). The resulting principal component was then placed into a stepwise regression model (Bottom of Table 4) to determine how it functioned as a predictor of every day functioning compared to NP and functional capacity measures. When we examined the prediction of clinician rated everyday activities, the self-assessment discrepancy factor score predicted 42% (R^2=.42, F=107.62, p<.001) of the variance and NP performance contributed an additional 3% of the variance (R^2=.45, F=60.22, p<.001). When vocational outcomes were analyzed, the self-assessment discrepancy factor score contributed 37% (R^2=.37, F=87.75, p<.001) of the variance; UPSA scores contributed an additional 5% of the variance (R^2=.42, F=53.29, p<.001). Finally, when social functioning and interpersonal outcomes were examined, the self-assessment discrepancy factor score contributed to 29% (r^2=.29, F=60.51, p<.001) of the variance; UPSA performance contributed an additional 2% of the variance (r^2=.31, F=53.29, p<.001).

In order to ensure that prediction everyday outcomes with difference scores was not yielding a biased result because the clinician rating of each domain is a component of the difference score, we recalculated the analyses for each of the three SLOF variables. For each analysis we excluded the domain specific difference score (e.g., excluding the difference score for everyday activities from the principal component score predicting clinician ratings of everyday activities) and recalculated the principal component, using it to predict the everyday outcomes. These analyses did reduce the variance accounted for: in SLOF everyday activities the new variance accounted by the global estimation variable was reduced to 28%, while for vocational activities the new variance accounted for was 25% and for social outcomes it was 15%. Thus, eliminating the domain-specific difference score did not eliminate the influence of self-assessment discrepancies on everyday outcomes and impaired self-assessment of functioning was still the most substantial predictor of real world functional outcomes.

Discussion

In this study discrepant self assessment of functioning across different domains including cognitive functioning and real world outcomes emerged as the single greatest predictor of real world functioning (social, vocational and everyday activities). This was true even when we controlled for any inherent overlap or intercorrelations in our predictor and outcome variables. Importantly, among those participants who misestimated their functioning, there was a general trend toward overestimation of functioning. The variance in real world outcomes accounted for by inaccurate estimation of functioning was actually greater than the variance accounted for by ability variables, including both NP performance and functional capacity. Although this is a cross-sectional study, it appears as though patient

with the greatest impairments in judging their functioning also have the greatest level of impairments in real world outcomes.

Some support for our hypothesis that momentary monitoring would contribute to more global forms of mis-estimation was obtained, by virtue of correlations between poorer global accuracy scores and greater mis-estimation of interpersonal and vocational performance. Further, metacognitive monitoring as measured by the adapted WCST did account for a small but still significant proportion of the variance in real world outcomes. Specifically, metacognitive performance predicted social outcomes and to (a lesser degree) everyday activities, while not reaching significance for vocational outcomes. Thus, metacognitive monitoring represents a correlate of more global self assessment deficits and a significant contributor to real world functioning and a possible treatment target.

It is important to note that the data used in the current study was obtained using high contact clinician informants and not just self-report. There is now substantial data, including the present analyses, to indicate that self-assessment of cognitive performance and everyday functioning is fallible in patients with schizophrenia (e.g., Green et al., 2011; McKibbin et al., 2004; Bowie et al., 2007; Durand et al., in press, Sabbag et al., 2011). However, it is understood that high contact clinician informants are not always available in clinical settings and not all patients can complete comprehensive batteries such as those employed in the present study. However, a substantial proportion of patients clearly have someone who is in a position to provide an accurate estimation of their functioning. Several large scale studies prior to the present one, including several treatment studies, have collected 200 schizophrenia patients with an available informant (Bowie et al., 2008; Harvey, Ogasa, et al., 2011; Harvey, Raykov, et al., 2011; Keefe et al., 2011).

There are several other limitations worthy of mention. In this research it is impossible to define and calculate the range of functioning that would be considered within the normal range. We were only able to measure discrepancies and use clinician evaluations as the reference for accuracy. Another important limitation of the present research was that social cognition measures were not employed. Past research (Pinkham et al., 2006; Fett et al., 2011) has found that performance on social cognitive tasks predicts substantially more variance in social outcomes than do neurocognitive factors. Mis-estimation of functioning predicted social outcomes in the current sample, but it did so to a lesser extent than it predicted vocational and everyday activities. Subsequent comprehensive investigations of social functioning and specific interpersonal skills should incorporate social cognitive measures, which are currently being evaluated for their validity with a process similar to MATRICS and VALERO (Pinkham, et al., 2014).

The results indicated that psychological interventions and treatments are needed that not only target insight on a contemporaneous basis but also to more specifically increase patients' ability to judge their functioning on a more global level. The current research indicates that this might hold promise for enhancing real world outcomes. Specifically, psychotherapy interventions incorporating insight-focused treatments are called for based on our results. This has also been suggested following previous investigations into metacognition and insight by Lysaker et al. (e.g., 2011a; 2011b; 2013; & 2014) and others

(i.e., Hasson-Ohayon, 2009). Finally, based on the added contribution of momentary monitoring skills observed in the present study, cognitive retraining interventions aimed at improving one's ability to function and make quick and accurate self-appraisals "in the moment" may also hold promise.

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Table 1

Demographic and Clinical, and Performance Variables in the VALERO II Patient Sample with Schizophrenia

	N=214	
Characteristic	**n**	**%**
Male	139	65
Race		
Caucasian	117	55
African American	77	36
Other	20	9.3
Hispanic Ethnicity	50	23.4
	Mean	SD
Age (Years)	41.0	12.4
Education	12.3	2.2
Mood and Performance Variables	Mean	SD
Beck Depression Inventory	15.33	11.68
UPSA-B Total Score	70.57	14.98
MCCB / Global NP T Score	37.41	8.71
Metacognition	Mean	SD
Koren Accuracy Score	36.48	13.44
Koren Global Monitoring	25.30	14.47

Note. Accuracy scores can range from 0-64

Table 2

Cognition, Functional Capacity, Meta-Cognition, Symptoms, and Everyday Functional Outcomes

	Clinician Ratings		Difference Scores (Patient – Interviewer)	
Variable	**Mean**	**SD**	**Mean**	**SD**
SLOF Interpersonal Subscale	22.45	5.97	2.25	8.36
SLOF Activities Subscale	44.40	10.66	4.04	13.05
SLOF Vocational Subscale	20.06	5.29	3.52	7.00
Cognitive Assessment Inventory	27.96	10.33	−4.40	12.48

Note.

Higher scores on the SLOF difference scores reflect patients reporting less impairment.

Lower scores on the Cognitive assessment inventory difference scores reflect patients reporting less impairment

Table 3

Correlations Between Clinician-rated Functioning vs. Cognition and Symptoms

SLOF Interviewer Ratings	**UPSA-B Total**	**CAI**	**Global NP T Score**	**Koren Global Monitoring**	**Koren Accuracy**	**R^2**
SLOF Interpersonal Subscale	0.26**	−.06	0.16*	−0.11	0.17*	0.17
SLOF Activities Subscale	0.28**	−.28**	−0.21**	−0.21**	0.22**	0.26
SLOF Vocational Subscale	0.31**	−.42**	−0.26**	−0.26**	0.25**	0.22
SLOF Difference Scores Between Clinician Ratings and Self-reports						
	UPSA-B Total	CAI Δ	Global NP T Score	Koren Global Monitoring	Koren Accuracy	R^2
SLOF Interpersonal Subscale	−0.15*	−0.43**	−0.20**	−0.22**	−0.23**	0.25
SLOF Activities Subscale	−0.07	−0.49**	−0.24**	−0.11	−0.16	0.25
SLOF Vocational Subscale	−0.09	−0.39**	−0.08	0.17*	−0.10	0.18

Note: All variance accounted for in simultaneous regressions with all variables entered in to the equation.

** p <0.01

* p<0.05

Table 4

Regression Analyses

Stepwise Regression Analyses Predicting Real World Outcomes				
SLOF Interviewer Ratings	**Step**	**Variable(s)**	**P**	**R^2**
SLOF Interpersonal Functions	1	CAI Δ	<.001	.12
	2	UPSA-B Total	<.001	.17
SLOF Activities Subscale	1	CAI Δ	<.001	.17
	2	Global NP T score	<.001	.26
SLOF Vocational Subscale	1	UPSA-B Total	<.001	.11
	2	CAI Δ	<.001	.18
	3	Koren Global Monitoring	<.001	.22
Derived Global Misestimation of Functioning Score Predicting Real world outcomes				
SLOF Interviewer Ratings	Step	Variable(s)	P	R^2
SLOF Interpersonal Functions	1	Misestimation score	<.001	.29
	2	UPSA-B Total	<.001	.31
SLOF Activities Subscale	1	Misestimation score	<.001	.42
	2	Global NP T score	<.001	.45
SLOF Vocational Subscale	1	Misestimation score	<.001	.37
	2	UPSA-B Total	<.001	.42