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Clinical and Cognitive Insight in a Compensatory Cognitive Training Intervention

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Abstract

The impact of limited insight is a crucial consideration in the treatment of individuals with psychiatric illness. In the context of psychosis, both clinical and cognitive insight have been described. This study aimed to evaluate the relationships between clinical and cognitive insight and neuropsychological functioning, psychiatric symptom severity, and everyday functioning in patients with a primary psychotic disorder participating in a compensatory cognitive training (CT) intervention. Sixty-nine individuals diagnosed with a primary psychotic disorder were randomized to a 3-month CT intervention or to standard pharmacotherapy, and they completed a comprehensive neuropsychological, clinical, and functional battery at baseline, 3 months, and 6 months. The CT intervention focused on habit formation and compensatory strategy learning in four domains: prospective memory, attention and vigilance, learning and memory, and problem-solving/cognitive flexibility. At baseline, better clinical insight was significantly related to better executive functioning and less severe negative symptoms. There was no significant association between cognitive insight and cognitive functioning, symptom severity, or everyday functioning ability. The CT intervention did not have an effect on clinical or cognitive insight, but better cognitive insight prior to participation in CT significantly predicted decreased positive and depressive symptom severity posttreatment, and better clinical insight predicted improved self-reported quality of life. Although clinical insight is related to executive functioning, the correlates of cognitive insight remain elusive. Intact insight appears to be beneficial in ameliorating clinical symptomatology like positive symptoms and depression, rather than augmenting cognition. It may be valuable to develop brief interventions aimed at improving clinical and cognitive insight prior to other psychosocial rehabilitation in order to maximize the benefit of treatment.

Insight is considered a crucial component of psychiatric illness. Historically, insight has been a unidimensional construct defined as awareness of having a mental disorder and recognition of the need for treatment (Amador et al., 1993; Birchwood, Smith, & Drury, 1994; Kay, Fiszbein, & Opler, 1987a). This is similar to the relevant neurological disorder anosognosia, a condition in which a person is unable to be aware of his or her impairment as a result of neurocognitive dysfunction resulting from brain injury (Rickelman, 2004). Recently, the concept of insight has expanded to include clinical insight as well as

metacognition or “thinking about thinking” (see Lysaker et al., 2010), a broad term that encompasses both cognitive insight and neurocognitive insight.

Clinical Insight

Clinical insight relates primarily to treatment outcomes in disordered populations and involves “the awareness of having a mental disorder or symptoms of a mental disorder” (Amador et al., 1993, p. 873). It has often been measured as a dichotomous variable, with patients rated as having “good” or “poor” insight based on whether the patient acknowledged or denied mental disturbance. This approach was limited because it failed to account for differing degrees of awareness, or partial insight (e.g., a patient acknowledges some symptoms but not others; Amador et al.). Contemporary measures of clinical insight are more continuous, and they incorporate awareness of multiple psychiatric symptoms as well as the need for treatment and the effects of medication.

Cognitive Insight

Cognitive insight is a recently defined aspect of metacognition (Beck, Baruch, Balter, Steer, & Warman, 2004). As described by Beck's research group (2004), cognitive insight involves a person's capacity to evaluate unusual experiences and question potentially flawed conclusions, which relies on distancing oneself from misguided beliefs and reevaluating misinterpretations. The capacity to reflect on experiences and recognize incorrect conclusions is reduced by impaired objectivity about cognitive distortions, loss of ability to gain perspective of these experiences, resistance to corrective information, and overconfidence in conclusions (Beck et al.). Previous research has demonstrated modest to moderate convergence between a measure of cognitive insight and measures of clinical insight, supporting the claim that cognitive and clinical insight are related but distinct concepts (.24–.64 range; Beck et al.; Pedrelli et al., 2004).

Neurocognitive Insight

Another type of metacognitive insight is neurocognitive insight, defined as the awareness of neuropsychological dysfunction in schizophrenia-spectrum disorders (e.g., impaired attention, memory, problem-solving; Medalia & Thysen, 2008). Instruments to measure neurocognitive insight have been created to assess insight into cognitive deficits compared with actual performance on cognitive tests (Medalia & Thysen, 2010), as well as to allow reliable measurement of patients' or caregivers' opinions about a patient's degree of neurocognitive deficit (Keefe, Poe, Walker, Kang, & Harvey, 2006).

The concepts of clinical and cognitive insight are especially relevant in psychotic disorders. Individuals with psychosis are prone to disorganized and delusional thinking, which can interfere with the ability to recognize symptoms of psychiatric illness (clinical insight) and discourage the pursuit of treatment. The ability to appraise erroneous beliefs (cognitive insight) is also affected by psychosis, leading to rigid and concrete thinking that impacts daily living as well as treatment adherence. By definition, the formation and maintenance of delusions are accompanied by steadfast conviction in the truth of such beliefs, even in the presence of contradictory evidence. This feature of psychosis precludes the use of corrective feedback, complicating treatments for psychotic disorders that involve medication maintenance or therapeutic intervention (Beck et al., 2004). Even if clinical insight is intact, lack of cognitive insight may limit cognitive skills like problem-solving, evidence gathering, and hypothesis testing, which are among the cornerstones of psychosocial therapy for psychosis (Gaudiano, 2006; McCann, 2001). Thus, the treatment implications of limited insight are profound. Antipsychotic medications have proven useful in reducing some symptoms of psychosis, but residual symptoms and negative side effects decrease treatment

adherence (Kane, 2001); this may be especially true for people with restricted insight. Numerous psychosocial treatments for psychotic disorders are available, but the utility of such interventions may be reduced if poor insight discourages people with psychotic disorders from adhering to the treatment or agreeing to participate at all. Therefore, clarification of the role of clinical and cognitive insight in psychosocial interventions is vital to the advancement of treatment for psychosis. Of particular importance is whether targeted cognitive training in self-monitoring and hypothesis testing might improve cognitive insight in those diagnosed with psychotic disorders.

Previous research has identified a link between clinical insight and neuropsychological functioning: better clinical insight has been related to better cognition in general (McEvoy et al., 2006), better executive functioning in general (Aleman, Agrawal, Morgan, & David, 2006), and better performance on specific executive functioning tests (Wisconsin Card Sorting Test, Aleman et al.; Tower of London Test, Medalia & Thysen, 2010). Meta-analytic data show that better clinical insight is associated with less severe positive and negative symptoms ($r = -.25$ and $-.23$, respectively; Mintz, Dobson, & Romney, 2003; see also McEvoy et al.; Saeedi, Addington, & Addington, 2007; Wiffen, Rabinowitz, Lex, & David, in press), but more severe depressive symptoms ($r = .18$; Mintz et al.; see also Drake et al., 2004; McEvoy et al.; Wiffen et al.). Thus, intact clinical insight may result in hopelessness, shame, and depression. People with schizophrenia who demonstrate good clinical insight are more likely to adhere to treatment and less likely to suffer prolonged psychotic symptom exacerbations (Lysaker et al., 2009; McEvoy et al.). Finally, good clinical insight is associated with better functional outcomes, including improvement in global assessment of functioning ratings and functional skills ratings after long-term inpatient treatment (Schwartz, Cohen, & Grubaugh, 1997), ability to benefit from cognitive behavioral social skills training (Emmerson, Granholm, Link, McQuaid, & Jeste, 2009), and social functioning (Saeedi et al.). There is little consensus regarding the relationship between changes in clinical insight and outcome, but some studies have found that improving insight leads to reduced psychotic symptoms (Saeedi et al.; but also see Wiffen et al.), improved functioning, and greater rate of remission (Saravanan et al., 2010).

Because the concept of cognitive insight is relatively novel, its relationship to cognition, symptom severity, and functioning has been less extensively investigated. Better cognitive insight as measured by the Beck Cognitive Insight Scale (BCIS) has been associated with better basic neurocognitive functions such as visual working memory, executive functioning (Orfei, Spoletini, Banfi, Caltagirone, & Spalletta, 2010), and verbal learning and memory (Lepage et al., 2008). Greater self-certainty (one indicator of poor cognitive insight) may be modestly associated with poorer executive functioning, but there appears to be no relationship between self-reflectiveness (an indicator of good cognitive insight) and neuropsychological performance (Cooke et al., 2010). Some data suggest that good cognitive insight is related to less severe positive symptoms (Bora, Erkan, Kayahan, & Veznedaroglu, 2007; but see also Greenberger & Serper, 2010), and greater reductions in positive symptoms following treatment (Perivoliotis et al., 2010). A recent study found that the occurrence of delusions was specifically associated with poor cognitive insight, but the occurrence of solitary hallucinations (i.e., no accompanying delusions) was related to good cognitive insight (Engel et al., 2010). Improvement in cognitive insight may also predict reduction in positive symptoms (Granholm et al., 2005; but see also Bora et al.). Cognitive insight may be particularly important for psychosocial interventions to improve cognition and daily functioning, but the existing literature is limited, with no published studies examining the relationship between cognitive insight and functional outcome.

Given the variable conclusions and variable effects across studies in the published literature, further investigation of clinical and cognitive insight and their relationship to

neuropsychological performance, psychiatric symptoms, and everyday functioning is necessary. In addition, the effect of insight on treatment outcome requires further investigation, particularly as nonpharmacological interventions for psychosis continue to accumulate. This study aimed to evaluate clinical and cognitive insight in patients with a primary psychotic disorder participating in a cognitive training (CT) intervention.

Consistent with previous literature and the idea that executive functioning (self-monitoring, hypothesis testing) might be especially related to insight, we hypothesized that better clinical and cognitive insight would be associated with better executive functioning, less severe positive symptoms, and more severe depressive symptoms. Secondly, because the intervention targeted specific domains of cognition (e.g., self-monitoring of strategy use) but not other clinical features of psychosis (e.g., self-monitoring of psychiatric symptoms), we hypothesized that the CT intervention would improve cognitive, but not clinical, insight. In addition, cognitive insight may reflect flexibility and openness to trying new strategies, so we believed it would be associated with a CT intervention-related improvement more so than clinical insight.

We also explored the relationships between clinical and cognitive insight at baseline and later neuropsychological and clinical treatment outcomes, to examine whether initial level of insight leads to differential impact of treatment (via, e.g., willingness to try new strategies).

METHOD

Participants

Participants included 69 individuals receiving outpatient psychiatric care who were enrolled in a study of compensatory cognitive training for psychosis, described in a previous report (Twamley, Savla, Zurhellen, Heaton, & Jeste, 2008; data from 38 of the 69 participants were included in this report, but no analyses related to insight were previously reported). Participants were diagnosed with a primary psychotic disorder (schizophrenia, schizoaffective disorder, psychosis not otherwise specified, or major depression with psychotic features); they underwent a baseline assessment and were randomized to the treatment or control group. A subsample of 23 participants received the cognitive training intervention and underwent at least one posttreatment assessment. A CONSORT diagram (Figure 1) is included to indicate sample size and attrition. The study was IRB approved, and all participants gave written informed consent to participate. Demographic and clinical characteristics of both samples are included in Table 1. Overall, participants in the main sample (who were given baseline assessment and randomized to treatment or control) had a mean age of 46 and had completed 13 years of education. A majority of the sample were men, Caucasian, never married, and living independently in the community. Participants were chronically ill (mean duration of psychotic illness was 23 years) and most had been prescribed atypical antipsychotic medication. Schizophrenia and schizoaffective disorder diagnoses were roughly equal. The characteristics of the subsample were similar; there were no significant demographic or clinical differences between the 23 cognitive training participants who had undergone posttreatment assessment and the 46 participants who had undergone baseline assessment only (i.e., lost to follow-up before 3-month assessment; $n = 18$) or who were given a follow-up assessment as part of the control group and were not included in the cognitive training subsample analyses ($n = 28$; all p s $> .188$).

Procedure

Potential participants were referred to the study by treating clinicians or self-response to recruitment flyers posted in psychiatric care centers. After being given a detailed description of the study, participants provided written informed consent to a research assistant.

Participants' diagnoses were confirmed via structured diagnostic interview (Mini International Neuropsychiatric Interview; Sheehan et al., 1998) or diagnostic chart review. Inclusion criteria were (a) DSM-IV (American Psychiatric Association, 1994) diagnosis of schizophrenia, schizoaffective disorder, or primary diagnosis of psychosis NOS or major depression with psychotic features, (b) English speaking, and (c) 18 years of age or older. Individuals were excluded from the study if they had (a) a substance use disorder in the past 30 days, (b) a history of neurological disease or injury, (c) mental retardation, or (d) concurrent enrollment in another treatment research protocol. Ongoing therapeutic interventions were permitted. After baseline assessment participants were randomly assigned to standard pharmacotherapy plus the CT intervention or to standard pharmacotherapy alone. A comprehensive neuropsychological, clinical, and functional battery was administered at baseline, 3 months (immediate posttreatment), and 6 months (follow-up); raters were blinded to group assignment. The CT intervention is a 12-week, 2-hour-per-week class that focuses on habit formation and compensatory strategy learning in four cognitive domains: prospective memory, attention and vigilance, learning and memory, and problem-solving/cognitive flexibility. Examples of compensatory strategies include the use of calendars, paraphrasing important information, brainstorming solutions to a problem, self-monitoring progress, and gathering pro and con evidence to test hypotheses. The cognitive flexibility module of CT includes strategies for heightening cognitive awareness, for example, self-monitoring or thinking about strategies one is using and modifying them as necessary. The primary targets of the CT intervention were cognition and everyday functioning; insight was examined as a secondary outcome. The main outcomes of the randomized controlled trial are reported elsewhere (Twamley et al., under review), but briefly, the CT intervention appears to improve cognition, negative symptoms, functional capacity, and quality of life.

Measures

Premorbid intellectual functioning was measured with the American National Adult Reading Test (ANART; Grober & Sliwinski, 1991). Cognitive functioning was measured with a battery including domains targeted in CT and domains not targeted in CT. Targeted domains and measures included

1. Prospective memory: Memory for Intentions Screening Test (total score; Raskin, 2004)
2. Attention and vigilance: Wechsler Adult Intelligence Scale, third edition (WAIS-III) Digit Span forward (Wechsler, 1997)
3. Verbal learning and memory: Hopkins Verbal Learning Test—Revised (HVLTR, total immediate recall and percent retained; Brandt & Benedict, 2001)
4. Executive functioning: Wisconsin Card Sorting Test (WCST; total correct; Kongs, Thompson, Iverson, & Heaton, 2000)

Domains and measures not targeted by the CT intervention included

1. Processing speed: WAIS-III Digit Symbol total correct (Wechsler, 1997)
2. Working memory: WAIS-III Letter-Number Sequencing total correct (Wechsler, 1997)
3. Language: Controlled Oral Word Association Test (AFV total; Benton & Hamsher, 1989)

Psychotic symptom severity was measured with the Positive and Negative Syndrome Scale, using the positive symptom total (sum of items P1–P7) and the negative symptom total (sum of items N1–N7; PANSS; Kay et al., 1987a). Depressive symptom severity was measured

with the Hamilton Depression Rating Scale (HAMD; sum of items 1–17; Hamilton, 1960), and quality of life was measured with the Quality of Life Interview (QOLI; Global Subjective Life Satisfaction score; Lehman 1988). Everyday functioning ability was measured with the UCSD Performance–Based Skills Assessment (UPSA; total score; Patterson, Moscona, McKibbin, Hughs, & Jeste, 2001) and the Social Skills Performance Assessment (SSPA; total score; Patterson, Moscona, McKibbin, Davidson, & Jeste, 2001), both role-play tests of real-world living and social skills, as well as the self-report Independent Living Skills Survey (ILSS; mean of all subscales; Wallace, Liberman, Tauber, & Wallace, 2000).

Clinical insight was measured with the Lack of Judgment and Insight item from the PANSS interview. The description of this clinician-rated item is “impaired awareness or understanding of one's own psychiatric condition and life situation. This is evidenced by failure to recognize past or present psychiatric illness or symptoms, denial of need for psychiatric hospitalization or treatment, decisions characterized by poor anticipation of consequences, and unrealistic short-term and long-range planning” (Kay, Opler, & Fiszbein, 1987b). Interviewers rate insight on a 1 (absent) to 7 (severe) scale using self-report information elicited directly from the interviewee; lower scores indicate better clinical insight. Raters for this study demonstrated good interrater reliability on the PANSS (ICC 0.80).

Cognitive insight was measured with the Beck Cognitive Insight Scale (Beck et al., 2004), a 15-item self-report questionnaire that assesses both self-reflectiveness and self-certainty. Respondents rate their agreement with various statements on a 0 to 3 scale. Items that comprise the self-reflectiveness (SR) subscale measure objectivity, reflectiveness, and openness to feedback (e.g., “At times I have misunderstood other people's attitudes towards me,” “Some of my experiences that have seemed very real may have been due to my imagination”). The self-certainty (SC) subscale assesses decision making and dogmatic certainty about beliefs and conclusions (e.g., “I know better than anyone else what my problems are,” “I cannot trust other people's opinion about my experiences”). Scores for each subscale are summed; higher scores on the SR subscale are considered favorable (i.e., more self-reflective), and higher scores on the SC subscale are considered poor (i.e., more overconfidence). The authors of the BCIS hypothesized that higher levels of self-certainty would diminish a person's capacity for self-reflection, so a composite index score (SR-SC index) is calculated by subtracting the self-certainty total from the self-reflectiveness total, and it is used as the principal indicator of cognitive insight. The possible score range of the BCIS SR-SC index is –18 through 27; higher scores indicate better cognitive insight.

Data Analyses

All variables were inspected for normality; the variable for change in digit span score and the variable for change in SSPA total were found to have leptokurtic distributions. Use of log-transformed variables did not change the results, so for ease of interpretation, the nontransformed results are reported. The first hypothesis was tested with Pearson correlations ($n = 69$) between the insight measures and neuropsychological test scores, symptom severity ratings, and everyday functioning measures. The second hypothesis was tested with repeated measures ANOVA of BCIS SR-SC index score using participants who underwent at least one posttreatment assessment ($n = 47$; 20 CT [3 participants had missing baseline BCIS data] and 27 SP [1 participant had missing baseline BCIS data]). Pearson correlations were used for the exploratory analyses ($n = 23$), testing baseline PANSS insight item as a predictor of change scores on neuropsychological measures, as well as clinical and functional outcomes; the same analysis was used for the baseline BCIS SR-SC index score. Alpha for significance was set at 0.05; data were analyzed using PASW Statistics for Windows (Version 18).

RESULTS

At baseline, the mean PANSS insight item score was 1.8 (range 1–6); the mean BCIS SR-SC index score was 6.6 (range –3–25; Table 1). This cognitive insight score is fairly consistent with, but slightly higher than, that previously reported in psychosis samples (Beck et al., 2004; Colis, Steer, & Beck, 2006; Martin, Warman, & Lysaker, 2010; Pedrelli et al., 2004). Table 2 includes mean posttreatment PANSS insight item score and BCIS SR-SC index score for the CT and the SP groups. The PANSS insight item score and the BCIS SR-SC index score were modestly, but not significantly, correlated at any time point (baseline $r = -.27$; $p = .070$; immediate posttreatment $r = -.22$; $p = .160$; follow-up $r = -.29$; $p = .053$), although the strength of correlations was similar to that reported previously (Beck et al.; Pedrelli et al.).

The first hypothesis was partially supported. Better clinical insight was significantly related to better executive functioning as measured by the WCST ($r = -.25$; $p = .037$), and less severe negative symptoms ($r = .27$; $p = .027$), but was not related to positive symptoms ($p = .105$) or depressive symptoms ($p = .477$). There were no significant baseline correlations between cognitive insight and neuropsychological test scores, symptom severity ratings, or functional outcomes (all p s $> .144$; see Table 3).

Contrary to our second hypothesis, participation in the CT intervention did not produce any significant changes in cognitive insight compared with the control group ($F[1, 45] = .03$; partial $\eta^2 = .001$; $p = .856$).

Regarding our exploratory analyses, neither baseline clinical insight nor cognitive insight predicted change on neuropsychological measures (Table 4). Higher cognitive insight at baseline significantly predicted lower positive symptom severity ($r = -.46$; $p = .040$), as well as decreased depressive symptom severity ($r = -.54$; $p = .014$) at posttreatment. In addition, better clinical insight at baseline significantly predicted increased subjective quality of life at posttreatment ($r = -.46$; $p = .036$; Table 4).

DISCUSSION

In contrast to our expectations, these results suggest minimal association between cognitive insight and cognitive functioning. Better clinical insight, however, appears to be related to better executive functioning and less severe negative symptoms. Although the CT intervention did not have an effect on clinical or cognitive insight, we found that better insight prior to participation in the CT intervention predicted decreased positive and depressive symptom severity, as well as improved self-reported quality of life at posttreatment.

This study was unable to replicate previous cross-sectional findings linking clinical and cognitive insight to general cognitive ability, positive symptoms, depression, or everyday functioning (Aleman et al., 2006; Bora et al., 2007; McEvoy et al., 2006; Mintz et al., 2003; Saeedi et al., 2007; Schwartz et al., 1997; Wiffen et al., 2010). However, our nonsignificant findings on the relationship between baseline BCIS and symptom severity replicate those of a recent study comparing BCIS self-reflectiveness and self-certainty on multiple PANSS domains (Greenberger & Serper, 2010). In addition, although other studies have found a relationship between cognitive insight and executive functioning (Cooke et al., 2010; Orfei et al., 2010), our results suggest instead that better clinical insight is related to better executive abilities. This is consistent with other findings that individuals with schizophrenia who showed better clinical insight performed better on measures of executive functioning (Aleman et al., 2006; Medalia & Thysen, 2010). It could be that individuals who acknowledge their psychiatric illness and identify a need for treatment exercise their

problem-solving abilities by seeking intervention. Our results also replicated other findings that those with better clinical insight demonstrated less severe negative symptoms (Mintz et al., 2003); although this finding was not hypothesized, the effect could be driven by overall illness severity or by a specific link between cognition and negative symptoms (Harvey, Koren, Reichenberg, & Bowie, 2006).

Whereas other treatment studies have shown evidence that insight can improve over time (Granholm et al., 2005; Saeedi et al., 2007), the CT intervention failed to demonstrate any effect on clinical or cognitive insight. This is not necessarily surprising, as CT does not specifically target insight. Our hypothesis, however, was that the hypothesis testing and self-monitoring strategies included in the CT intervention might improve cognitive insight. It is possible that those who enroll in treatment programs are more insightful to begin with, because they self-selected into a study targeting improvement in cognitive functioning. Indeed, this sample started out with relatively good insight, which resulted in a restricted range of insight scores and could have limited potential for improvement in insight. Nonetheless, this study was conducted with a sample of individuals interested in rehabilitation, so the results should generalize to similar, rehabilitation-seeking samples.

Finally, these results extend previous findings by showing that better clinical insight at baseline predicts improved quality of life, and better cognitive insight at baseline predicts decreased severity of positive and depressive symptoms after CT. It may be the case that intact insight allows for more flexible appraisal of one's life situation, enabling a more interactive approach to rehabilitation. Better insight did not predict improvement across all domains, however, which may suggest that intact insight is not a necessary condition to benefit from cognitive training, but rather that the CT intervention can be effective regardless of baseline insight level.

Limitations of this study include small sample size in the CT post-treatment subsample, which limited power to detect significant change in clinical or cognitive insight and accordingly increased the chance of a type II error. In addition, no corrections were made for multiple comparisons, which may impact the statistical significance of the results. Further, clinical insight was measured with only one item of the PANSS interview. Previous research has supported the convergent validity of the PANSS insight item with other measures of clinical insight such as awareness of mental disorder on the Scale to Assess Unawareness of Mental Disorder (SUMD; $r = 0.66$; $p < 0.001$; Tranulis, Lepage, & Malla, 2008) and the Birchwood Insight Scale (IS; $r = -0.65$; $p < 0.001$; Cooke et al., 2007). Nevertheless, it would have been beneficial to include another more comprehensive instrument of clinical insight like the SUMD (Amador et al., 1993) or the IS (Birchwood et al., 1994). Our measure of cognitive insight has limitations as well: the BCIS is more likely to be related to flexibility about maladaptive thoughts and may not accurately reflect flexibility in trying new strategies (e.g., flexibility in examining thoughts may not be the same process as flexibility in strategy use for medication adherence or appointment attendance.) Also, because the BCIS is a relatively new instrument, its psychometric properties are still under evaluation and its use remains limited to research samples. Finally, this study did not evaluate neurocognitive insight, which is a more recently developed concept; future cognitive remediation studies would benefit from measurement of neurocognitive insight because it may predict treatment acceptance and engagement.

Despite these limitations, the current study is among the first to investigate clinical and cognitive insight during the course of a cognitive intervention. Although numerous studies have examined cross-sectional relationships between insight and cognitive and clinical domains, few have demonstrated the influence of insight in longitudinal designs. Also, this study included a comprehensive battery of neuropsychological measures, psychiatric

symptom ratings, and everyday functioning measures, capturing the broad applicability of insight to treatment outcomes.

If these results remain consistent in larger, more diverse samples, the implications for treatment are informative. First, level of cognitive and clinical insight might be immaterial to interventions targeting cognition exclusively. Successful cognitive remediation appears possible despite poor insight, as long as an individual is willing to enroll in and adhere to a treatment protocol. However, limited cognitive insight might reduce interest in cognitive remediation interventions. Second, intact insight appears to be beneficial in ameliorating clinical symptomatology such as positive symptoms and depression. If this is the case, it would be valuable to include awareness-heightening strategies as part of the rehabilitation readiness process for individuals in the precontemplation stage (Prochaska & Velicer, 1997) who may not be ready to enroll in a treatment program. Also, it may be possible to develop brief interventions aimed at improving clinical and cognitive insight prior to other psychosocial rehabilitation, in order to maximize the benefit of treatment. Further, because the impact of limited insight has profound treatment implications, patients and families may benefit from psychoeducational resources to encourage adherence to treatment (e.g., Amador, 2000). Ultimately, the goal of any intervention is to improve everyday functioning for those who suffer from psychiatric illness. Demonstrating improvement in psychiatric symptoms and quality of life may be a first step, but further investigation is warranted to explore how these benefits might extend to everyday functioning and successful community integration in individuals with psychosis.

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Figure 1.
CT CONSORT Diagram.

Table 1

Demographic and clinical characteristics of the samples

	Randomized Sample (n = 69)	CT Posttreatment Sample (n = 23)
	Mean (SD) or %	Mean (SD) or %
Age (years)	46.3 (9.7)	44.4 (10.4)
Duration of illness (years)	23.3 (12.3)	20.5 (14.2)
Education (years)	12.9 (1.7)	13.3 (1.8)
ANART estimated IQ	106.9 (10.0)	106.0 (9.4)
Male	65.2	65.2
Caucasian, non-Hispanic	63.8	73.9
Diagnosis		
Schizophrenia	53.6	43.5
Schizoaffective	43.5	52.2
Psychosis NOS	1.4	4.3
MDD + psychotic features	1.4	0.0
Antipsychotic medication		
None	6.0	0
Atypical only	85.1	90.5
Typical only	4.5	4.8
Both atypical and typical	4.5	4.8
Living situation		
House or apartment	80.7	86.9
Board and care	16.4	13.0
Homeless	3.0	0
Marital status		
Single, never married	55.9	60.9
Divorced/separated	29.4	34.8
Married	13.2	4.3
Widowed	1.5	0
PANSS insight item score	1.8 (1.4)	1.9 (1.5)
BCIS index score	6.6 (5.6)	7.6 (5.5)

Note. ANART = American National Adult Reading Test; MDD = Major Depressive Disorder. PANSS = Positive and Negative Syndrome Scale; BCIS = Beck Cognitive Insight Scale.

Table 2

Posttreatment clinical and cognitive insight scores by group

	Immediate Posttreatment						Follow-up					
	CT			SP			CT			SP		
	n	Mean (SD)	Range	n	Mean (SD)	Range	n	Mean (SD)	Range	n	Mean (SD)	Range
PANSS insight item	20	2.0 (1.3)	1–5	24	2.1 (1.7)	1–6	21	1.9 (1.3)	1–4	25	2.1 (1.7)	1–6
BCIS SR-SC index	20	6.4 (6.8)	–9–17	24	5.6 (6.0)	–13–17	22	7.6 (6.1)	–4–19	25	5.3 (5.3)	–10–6

Note. PANSS = Positive and Negative Syndrome Scale; BCIS = Beck Cognitive Insight Scale.

Table 3

Baseline correlations between clinical/cognitive insight and neuropsychological variables, symptom severity ratings, and everyday functioning variables

	PANSS Insight Item		BCIS SR-SC Index	
	Pearson Correlation	<i>p</i>	Pearson Correlation	<i>p</i>
Neuropsychological variables				
MIST summary score	-.07	.565	.07	.588
Digit Span forward total score	-.02	.853	.06	.617
HVLT-R immediate recall total score	.03	.787	.12	.351
HVLT-R percent retained score	-.00	.987	.18	.155
WCST-64 total correct	-.25	.037	.13	.325
Digit symbol total correct	-.05	.683	-.17	.167
Letter Number sequencing total score	-.04	.747	-.01	.921
Animals/Fruits/Vegetables total correct	-.11	.360	.19	.144
Symptom severity variables				
PANSS positive total	.20	.105	.05	.684
PANSS negative total	.27	.027	-.08	.509
HAMD total	-.09	.477	.19	.187
QOLI global life satisfaction	.19	.125	.11	.388
Everyday functioning variables				
UPSA total	-.13	.281	.15	.248
SSPA total	-.17	.171	-.07	.565
ILSS mean of subscales	.05	.680	-.01	.971

Note. Significant correlations are indicated with bold font. MIST = Memory for Intentions Screening Test; HVLT-R = Hopkins Verbal Learning Test-Revised; WCST = Wisconsin Card Sorting Test; PANSS = Positive and Negative Syndrome Scale; HAMD = Hamilton Depression Rating Scale; QOLI = Quality of Life Interview; UPSA = UCSD Performance-Based Skills Assessment; SSPA = Social Skills Performance Assessment; ILSS = Independent Living Skills Survey.

Table 4

Baseline clinical/cognitive insight as predictors of change in neuropsychological domains, symptom severity ratings, and everyday functioning measures

Change Score	PANSS Insight Item		BCIS SR-SC Index	
	Pearson Correlation	<i>p</i>	Pearson Correlation	<i>p</i>
Neuropsychological domains				
Prospective memory	-.16	.493	.05	.845
Attention	-.17	.443	.24	.302
Verbal learning	-.01	.975	.42	.063
Verbal memory	.06	.779	-.11	.643
Executive functioning	.21	.341	.23	.329
Processing speed	-.05	.821	-.15	.527
Working memory	-.28	.213	.19	.431
Language	.33	.136	.04	.876
Symptom severity ratings				
PANSS positive symptoms	-.07	.763	-.46	.040
PANSS negative symptoms	-.31	.166	.20	.394
HAMD depressive symptoms	-.17	.446	-.54	.014
QOLI global life satisfaction	-.46	.036	.05	.822
Everyday functioning measures				
UPSA	.36	.111	.10	.662
SSPA	.02	.923	-.13	.589
ILSS	-.11	.635	.06	.803

Note. Significant correlations are indicated with bold font. PANSS = Positive and Negative Syndrome Scale; HAMD = Hamilton Depression Rating Scale; QOLI = Quality of Life Interview; UPSA = UCSD Performance-Based Skills Assessment; SSPA = Social Skills Performance Assessment; ILSS = Independent Living Skills Survey.