

# Social Cognition and Interaction Training (SCIT) for inpatients with schizophrenia spectrum disorders: Preliminary findings

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## Abstract

Individuals with schizophrenia exhibit consistent deficits in social cognition such as emotion perception, attributional style, and theory of mind, which may be targets of psychosocial treatments. Previous intervention studies have typically focused on only one aspect of social cognition and have not assessed generalization of treatment to improvements in social functioning. This paper describes preliminary data from a new group-based treatment, Social Cognition and Interaction Training (SCIT), aimed at improving social cognition in schizophrenia. Eighteen inpatients with schizophrenia spectrum disorders completed SCIT and were compared with 10 inpatients who completed a coping skills group. Participants were assessed at pre-test and post-test on measures of emotion and social perception, theory of mind, attributional style (e.g., blame, hostility, and aggression), cognitive flexibility, and social relationships. We also collected data on the frequency of aggressive incidents on the treatment ward. The results showed that compared to the control group, SCIT participants improved on all of the social cognitive measures and showed better self-reported social relationships and fewer aggressive incidents on the treatment unit at post-test. Importantly, this change was independent of changes in clinical symptoms over time and supports the unique role of SCIT in improving social cognitive deficits in schizophrenia.

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## 1. Introduction

Impairments in social functioning are among the hallmark characteristics of schizophrenia (APA, 2000) and these impairments are more pronounced in schizophrenia than in any other psychiatric disorder (Mueser and

Bellack, 1998). To improve social functioning, researchers have begun to turn their attention to social cognition and persons with schizophrenia show consistent deficits in three primary domains: Theory of mind (ToM), attributional style, and emotion perception (Penn et al., 2006).

It is now time to consider social cognition as a target of intervention research (Couture et al., 2006) as social cognition appears to have a *stronger relationship* with functional outcome than neurocognition (Penn et al., 1996; Pinkham and Penn, 2006) and may serve as a direct predictor (Brune, 2005; Roncone et al., 2004) or mediator

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(Addington et al., 2006; Sergi et al., 2006) of outcome. Taken as a whole, this body of research strongly supports the role of social cognition as an important treatment target.

Previous social cognitive interventions have focused on a single ability, such as emotion perception or theory of mind (Frommann et al., 2003; Penn and Combs, 2000; Kayser et al., 2006; Russell et al., 2006; Silver et al., 2004; Wolwer et al., 2005) with little attention to the generalization of these interventions. For example, Choi and Kwon (2006) showed that a 6 month trial of Social Cognition Enhancement Training led to improved contextual processing, but was less effective for social sequencing or emotion perception. Importantly, none of the extant interventions specifically target the three key domains of social cognition impaired in schizophrenia: emotion perception, ToM, and attributions, and the processes the underlie them (i.e., need for closure and cognitive rigidity).

To address these limitations, we developed Social Cognition and Interaction Training (SCIT; Roberts et al., 2006). SCIT is a flexible 18–24 week, group based, manualized intervention designed to improve emotion perception, attributional style, and theory of mind abilities for persons with schizophrenia. The focus on these three core domains of social cognitive impairment distinguishes SCIT from existing interventions. In a pilot study, SCIT was effective in improving hostility and ToM, but not emotion perception abilities among inpatients (Penn et al., 2005). To strengthen the emotion perception component of SCIT, we added an additional session of emotion mimicry training, and review and reinforce training strategies throughout the intervention.

In this study, we compared the effectiveness of SCIT to a coping skills group and predicted that individuals who completed SCIT would show greater improvement in social and emotion perception, ToM, attributional style for ambiguous situations as well as in cognitive flexibility, need for closure, and social relationships. Finally, since there is a link between attributions of hostility and aggression (Waldheter et al., 2005), we predicted that SCIT group members would exhibit fewer aggressive incidents on the treatment ward following treatment, which would lend support to the functional significance of SCIT.

## 2. Methods

### 2.1. Participants

A total of 18 individuals completed SCIT and 10 individuals completed a coping skills group (Table 1). All

participants were recruited from a forensic psychiatric treatment facility in Oklahoma and had a schizophrenia-spectrum diagnosis based on the SCID-P (First et al., 2001).

### 2.2. Intervention conditions

SCIT was conducted over an 18-week period (1 session/week) with each session lasting approximately 60 min. SCIT is comprised of three phases: emotion training (defining emotions, emotion mimicry training, understanding paranoia), figuring out situations (distinguishing facts from guesses, jumping to conclusions; understanding bad events), and integration (checking out guesses in real life). A more detailed description SCIT is presented elsewhere (Penn et al., *in press*). We recruited for SCIT by providing a brief description of the group to each treatment ward (approximately 75 persons). From a list of 26 interested participants, we used a random number table to select two groups of 10 and 8 individuals to complete SCIT. A coping skills group focused on symptom management, problem-solving, and relapse prevention skills served as the comparison condition. This group was part of the routine treatment program (1 h/week for 18 weeks) and was comprised of participants who agreed to be in the group and who were not enrolled in SCIT. We did not have control over enrollment in the coping skills group. Attendance rates for the SCIT and coping skills groups were 96% and 90%, respectively.

### 2.3. Measures

Clinical assessments included the SCID-P, PANSS (Kay et al., 1987), WRAT-III reading (Wilkinson, 1993),

Table 1  
Summary of participant characteristics

Variable	SCIT	Control
	Mean (S.D.)	Mean (S.D.)
<i>N</i>	18	10
Age (years)	41.3 (11.2)	44.0 (10.6)
Educational Level (years)	11.3 (1.6)	11.5 (0.97)
% White	61	50
% Male	67	90
% Schizophrenia	83	80
Length of Illness (years)	18.4 (8.4)	19.7 (7.5)
Number of hospitalizations	4.5 (3.2)	4.3 (3.9)
CPZ equivalents	569.2 (336.9)	441.0 (417.2)
Pre-morbid social functioning	2.6 (1.7)	2.0 (1.0)
WRAT-III reading <sup>a</sup>	86.2 (13.5)	76.2 (16.3)

CPZ=Chlorpromazine equivalent dosages (Woods, 2003); WRAT-III=Wide Range Achievement Test-III; <sup>a</sup>WRAT-III reading subtest scores reported as standard scores ( $M=100$ ,  $S.D.=10$ ).

Table 2  
Outcome measures by treatment condition

Variable	SCIT		Control		Group × Time interaction effect size <sup>a</sup> $\eta_p^2$
	Pre-test <i>M</i> (S.D.)	Post-test <i>M</i> (S.D.)	Pre-test <i>M</i> (S.D.)	Post-test <i>M</i> (S.D.)	
PANNS total score	98.5 (20.0)	90.3 (15.2)	83.4 (33.0)	87.4 (32.1)	.08
PANSS negative total	22.6 (6.7)	20.6 (5.2)	20.4 (8.7)	21.2 (8.5)	.04
Social perception measures	–	–	–	–	–
Face emotion identification	11.5 (2.6)	15.9 (1.5)*	9.3 (3.4)	10.3 (3.0)	.31
Face emotion discrimination	22.6 (2.3)	26.0 (1.9)*	22.3 (2.7)	20.7 (3.7)	.43
Social perception scale	14.4 (6.2)	25.7 (5.7)*	16.9 (7.5)	12.9 (6.1)	.62
Theory of mind measures	–	–	–	–	–
Hinting task	13.6 (2.3)	19.8 (0.32)*	14.8 (3.3)	12.4 (3.7)	.70
Attributional style and ambiguity	–	–	–	–	–
AIHQ hostility ambiguous	2.0 (0.57)	1.3 (0.34)*	1.5 (0.56)	2.1 (0.44)	.56
AIHQ blame ambiguous	2.6 (0.61)	2.3 (0.57)*	2.5 (0.64)	3.1 (0.79)	.34
AIHQ aggression ambiguous	1.5 (0.35)	1.2 (0.27)*	1.4 (0.42)	1.5 (0.40)	.22
NCS total score	166.9 (20.8)	150.7 (18.2)*	161.7 (12.4)	166.5 (9.2)	.18
NCS intolerance of ambiguity subscale	36.9 (5.6)	27.1 (8.5)*	32.4 (4.1)	36.8 (5.4)	.52
Cognitive flexibility	–	–	–	–	–
Trail making test, part B (s)	132.8 (43.4)	75.9 (23.7)*	142.1 (87.2)	151.6 (52.9)	.46

\* $p < .01$  (significant Group × Time interaction; ANOVA); AIHQ = Ambiguous Intentions Hostility Questionnaire; NCS = Need for Closure Scale; PANSS = Positive and Negative Syndrome Scale.

<sup>a</sup>PANSS change score (pre-test PANSS – Post-Test PANSS)/Pre-Test PANSS was used as the covariate in the analyses.

and the Zigler–Glick Pre-morbid Social Competence Scale (Glick et al., 1985). On the PANSS, we focused on the total score to reflect overall level of symptomatology and the negative symptom score due to its link with impaired social functioning (Kirkpatrick et al., 2006).

Social cognition consisted of measures of emotion (Face Emotion Identification Test and Face Emotion Discrimination Test; Kerr and Neale, 1993) and social perception (Social Perception Scale; total number of accurate details; Garcia et al., 2003), ToM (Hinting Task; Corcoran et al., 1995), attributional style (Ambiguous Intentions Attributional Questionnaire, AIHQ; Combs et al., in press), need for closure and tolerance for ambiguity (Need for Closure Scale; Webster and Kruglanski, 1994), cognitive flexibility (Trail Making Test part B; Reitan and Davidson, 1974), and social

functioning (Social Functioning Scale social engagement and interaction subscales; Birchwood et al., 1990). The AIHQ contained a Hostility and Aggression bias score, which was independently scored by two raters (ICC's for both bias scores were .80+), along with a composite Blame score comprised of participant ratings of blame, anger, and intent. We examined AIHQ scores for the ambiguous situations only as these are most sensitive to social cognitive biases (Combs et al., in press). Finally, we collected data on the number of aggressive incidents (physical and verbal) on the treatment ward for the 3 months prior to and following the groups. Two blinded examiners administered the assessment measures. Participants were paid a stipend for completing the assessments, but no incentives were provided for attending the groups.

Table 3  
Social relationship and aggression scores by treatment condition

Variable	SCIT		Control		Group × Time interaction effect size <sup>a</sup> $\eta_p^2$
	Pre-test <i>M</i> (S.D.)	Post-test <i>M</i> (S.D.)	Pre-test <i>M</i> (S.D.)	Post-test <i>M</i> (S.D.)	
Social functioning scale	–	–	–	–	–
SFS engagement	10.7 (1.6)	13.7 (1.0)*	10.6 (2.1)	10.4 (2.5)	.44
SFS interpersonal	6.8 (1.4)	8.6 (0.48)*	7.5 (1.3)	6.8 (1.8)	.37
Aggressive incidents on ward	2.9 (2.0)	1.0 (1.3)*	2.0 (1.4)	2.3 (1.7)	.38

\* $p < .01$  (significant Group × Time interaction; ANOVA); SFS = Social Functioning Scale.

<sup>a</sup>PANSS change score (pre-test PANSS – Post-Test PANSS)/Pre-Test PANSS was used as the covariate in the analyses.

### 3. Results

We found no differences between the two groups on the demographic or clinical variables (see [Table 1](#)). In addition, there were no differences between the treatment groups on the social cognition measures or the PANSS total or negative symptom scores at pre-test.

We conducted a series of 2 Group (SCIT vs. Control; between subjects)  $\times$  Time (pre-test vs. post-test; within subjects) mixed model ANOVA's on the outcome measures. We entered a PANSS change score ([pre-test PANSS – post-test PANSS]/pre-test PANSS) as a fixed covariate in the analyses. We chose to examine the PANSS total score since it provides the broadest assessment of symptom severity.

Across all of the analyses, there were significant Group  $\times$  Time interactions with consistent improvements in social and emotion perception, ToM, and attributions for ambiguous situations for SCIT participants ([Tables 2 and 3](#)). Also, SCIT participants showed improvement in cognitive flexibility, need for closure, and self-reported social relationships and a significant reduction in the number of aggressive behaviors on the treatment unit. These improvements were found even after controlling for changes in psychiatric symptoms over time.

### 4. Discussion

The study provides preliminary data on the efficacy of SCIT in a sample of forensic inpatients with schizophrenia spectrum disorders. Using a quasi-experimental design, we found that individuals who received SCIT improved in all social cognitive domains, reported better social relationships, and exhibited fewer aggressive behaviors on the ward. All of the effect sizes were moderate to large in magnitude. Furthermore, the improvements in social cognition were not a product of changes in clinical symptoms. These results replicate and extend upon our initial positive, uncontrolled findings found in a small sample of inpatients with schizophrenia (see [Penn et al., 2005](#)).

Participants also reported improvements in their ability to interact with others and the size and quality of their social network on the treatment ward. However, this improvement was based on a self-report measure, which may be subject to demand characteristics, and was limited to interactions on the treatment ward. On the unit, there were fewer reported incidents of verbal or physical aggression for SCIT participants, which lends support for the generalization of SCIT to participants' ward behaviors.

The study was quasi-experimental and cannot lead to the same causal inferences as a randomized trial. The participants were all forensic inpatients who expressed an interest in SCIT and it is possible that motivation (to improve, gain release, or privileges) may have affected the external validity of the results. The sample sizes were relatively small which underscores the need to replicate these findings with a larger sample. Our selection of some of the measures such as the Trail Making Test was related to their brevity and ease of completion and other more sensitive measures (e.g., WCST) could have been used.

In sum, we found that individuals who participated in SCIT showed improved social cognition, social relationships, cognitive flexibility, and reduced aggression. Although these initial results are promising, further research on this treatment is needed; particularly a randomized controlled trial. The current research is an initial step in establishing the efficacy of this new intervention.

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