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Brief report

Social cognition and interaction training (SCIT) for outpatients with bipolar disorder

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ABSTRACT

Introduction: Patients with bipolar disorder show social cognition deficits during both symptomatic and euthymic phases of the illness, partially independent of other cognitive dysfunctions and current mood. Previous studies in schizophrenia have revealed that social cognition is a modifiable domain. Social cognition and interaction training (SCIT) is an 18-week, manual-based, group treatment designed to improve social functioning by way of social cognition. **Method:** 37 outpatients with DSM-IV-TR bipolar and schizoaffective disorders were randomly assigned to treatment as usual (TAU)+SCIT ($n=21$) or TAU ($n=16$). Independent, blind evaluators assessed subjects before and after the intervention on Face Emotion Identification Task (FEIT), Face Emotion Discrimination (FEDT), Emotion Recognition (ER40), Theory of Mind (Hinting Task) and Hostility Bias (AIHQ). **Results:** Analysis of covariance revealed significant group effects for emotion perception, theory of mind, and depressive symptoms. The SCIT group showed a small within-group decrease on the AIHQ Blame subscale, a moderate decrease in AIHQ Hostility Bias, a small increase in scores on the Hinting Task, a moderate increase on the ER40, and large increases on the FEDT and FEIT. There was no evidence of effects on aggressive attributional biases or on global functioning. **Limitation:** No follow up assessment was conducted, so it is unknown whether the effects of SCIT persist over time. **Conclusion:** This trial provides preliminary evidence that SCIT is feasible and may improve social cognition for bipolar and schizoaffective outpatients.

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1. Introduction

Social cognition is “the cognitive ability to infer mental states to oneself and to others in terms of thought, emotion and intention”, which makes it possible “to predict the behaviour of others and to understand the social information of the surroundings” (Premack and Woodruff, 1978; Baron-Cohen, 1995). In the last decade, the construct has been mainly studied in schizophrenia, where it has been considered a mediator for basic neurocognitive processes and the acquisition of social abilities, as well as a correlate of social functioning (Kee et al., 1998; Green and Nuechterlein, 1999; Brüne and Juckel 2010).

Since social cognition is consistently related to functional outcomes in schizophrenia (Brüne et al., 2007; Fett et al., 2011; Couture et al., 2011) and bipolar disorder Lahera et al. (2012a,b),

there has been recent interest in interventions aimed at improving social cognition (Horan et al., 2009; Wolwer et al., 2005) developed the Training in Affect Recognition program to remedy facial emotion perception deficits in schizophrenia, and Horan et al., 2009 conducted a randomized clinical trial providing initial support for the feasibility and efficacy of a new social cognitive skills training program. SCIT (social cognition and interaction training, Roberts et al., 2006) has shown to be feasible and effective in the improvement of various social cognition domains in individuals with schizophrenia (Penn et al., 2005, 2007; Roberts and Penn, 2009).

Although there are fewer studies examining social cognition in bipolar disorder, there is some evidence that deficits in Theory of Mind (ToM) are present not only during symptomatic phases of the illness, but also in euthymia (Kerr et al., 2003; Bora et al., 2005; Lahera et al., 2008; Montag et al., 2010; Wolf et al., 2010; Martino et al., 2011). A recent meta-analysis showed that impairments in BD are associated with moderate effect sizes for mentalizing skills and small effect sizes for facial affect recognition, although patients do not show impaired social cognition

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relative to controls in all studies (Samamé et al., 2012). Nevertheless, no study has assessed the effectiveness of a social cognition intervention in bipolar disorder. The aims of the present study, therefore, are to implement SCIT for individuals with bipolar and schizoaffective disorders in the context of a controlled clinical trial, and to evaluate whether SCIT is more effective than treatment as usual (TAU) in improving social cognition and social functioning.

2. Methods

2.1. Participants

Thirty-seven individuals with DSM-IV-TR bipolar I ($n=28$) or II ($n=5$) or schizoaffective disorder ($n=4$) were recruited for the study. All participants were between 18 and 65 years of age and were receiving regular outpatient treatment. Inclusion criteria were: diagnosis of bipolar or schizoaffective disorder, as confirmed by the Structured Clinical Interview for Diagnosis of Symptoms (SCID, DSM-IV-TR); to be on outpatient follow-up for at least the previous year; being within an euthymic phase, defined by absence of affective relapse for at least three months. Exclusion criteria were: any DSM-IV-TR Axis I comorbidity (except for nicotine or caffeine dependence); receiving any psychotherapy beyond TAU standard of care; mental retardation ($IQ < 70$); organic brain damage; deafness or difficulty speaking and understanding Spanish. The ethics committee of the Principe de Asturias University Hospital approved the protocol, and all of the participating subjects gave their written informed consent.

2.2. Treatment conditions

TAU consisted of standard follow-up including clinical management and medication by a psychiatrist. SCIT (Roberts et al., 2006) is an 18–24-week, group based, manualized intervention originally developed for individuals with schizophrenia that is designed to improve emotion perception, attributional style, and theory of mind abilities. The present application of SCIT to individuals with bipolar disorder was facilitated by an intensive training conducted by DLP followed by a translation of the original instruction manual into Spanish. Sessions were audiotaped and reviewed to assure fidelity to the manual. Thus, SCIT consisted of three phases: emotional training (definition of emotions, facial expression training, understanding of paranoid symptoms as an emotion); role-play social situations (distinguishing facts from guesses, jumping to conclusions, understanding bad events); and integration of learning. Two SCIT groups were carried out under similar conditions and with the same co-therapists (two experienced psychologists trained in cognitive behavioral therapy). Each group comprised a maximum of 12 patients with each session lasting approximately 60 min.

Participants were allocated in a 2:1 ratio using a computer-generated list of random numbers. Of the 37 patients who met inclusion criteria and agreed to participate in the study, 24 were initially randomized to SCIT (experimental condition) and 13 to TAU (control condition). However, four SCIT patients were reassigned to TAU due to difficulty attending meetings ($n=2$) or declining to participate ($n=2$). One patient assigned to TAU was reassigned to SCIT after expressing wishes to initiate therapy. Hence, the intent to treat samples comprised 21 patients in the SCIT group and 16 in the TAU group; all 37 patients completed baseline and post-treatment assessments.

2.3. Measures

Variables: Trained raters who were blind to treatment condition assessed participants on the following variables at baseline and post-treatment:

- Social cognition
 - Emotion perception was measured with Face Emotion Identification Task and the Face Emotion Discrimination Task (FEIT and FEDT; Kerr and Neale, 1993). The FEIT comprises 19 photographs of faces expressing one of six basic emotions (happy, sad, angry, afraid, surprised and ashamed); the participant's task is to identify the emotion expressed by each face. The FEDT comprises 30 pairs of faces and requires the participant to judge whether the two faces in each pair are displaying the same or different emotions.
 - Emotion recognition was measured with the Emotion Recognition-40 (ER40) task, in which participants are asked to judge, one at a time, which emotion is shown on a series of 40 faces.
 - Theory of mind was assessed with the Hinting Task (Corcoran et al., 1995), consisting of 10 brief vignettes containing social hints that the respondent must interpret. Trials are scored from 0 to 2, with higher scores indicating better performance.
 - Social cognitive biases were assessed using the Ambiguous Intentions Hostility Questionnaire (AIHQ, Combs et al., 2007). Scored vignettes consist of situations in which the intentions of the vignette characters are ambiguous. Participants are asked to rate on a Likert scale why they think the protagonist acts this way (AIHQHB subscale, Hostility Bias), whether the other person performed the action on purpose (AIHQJS subscale, Intentionality score) and how much they would blame him/her (AIHQBS subscale, Blame score). Likewise, they rate how angry the situation would make them feel (AIHQAS, Anger score) and how they would respond to this situation (AIHQAB, Aggressivity Bias). Higher scores reflect more hostile, negative, personal, and aggressive attributions.
- Clinical and functional variables

The following clinical variables were included in the initial assessment: number and type of previous affective episodes (depression, mania, hypomania or mixed); duration of the illness; age at onset; number of hospitalizations; type of bipolar disorder; and history of psychotic symptoms. Depressive symptoms were assessed with the Hamilton Depression Rating Scale (HAMD; Hamilton, 1960) and manic symptoms with the Young Mania Rating Scale (YMRS; Young et al., 1978). Psychosocial functioning was measured using the Functioning Assessment Short Test (FAST; Rosa et al., 2007) and Global Assessment of Functioning scale (GAF, DSM-IV) were used to measure psychosocial functioning.

2.4. Data analysis

Statistical analyses were conducted on the intent-to-treat sample (SCIT $n=21$) using 2-tailed tests and a significance level of $p < .05$. Between-group differences in post- and pre-test values were probed using a univariate ANCOVA for each outcome variable. Post-treatment scores were treated as dependent variables, treatment condition as a fixed factor, and pre-treatment scores as covariates. Baseline scores on the HAMD were also entered as a covariate for all social cognition measures to control for the effect of affective symptoms on social cognition. A maximum likelihood value was imputed for one participant missing baseline HAMD data. Between-group effect size estimates are presented using Cohen's partial eta squared, while within-group effect size estimates are presented using Cohen's d Cohen

(1998). The analyses were then replicated with the four schizoaffective participants excluded.

3. Results

Seventeen of 21 patients completed therapy (80.9%), defined as attending more than half of the sessions and at least two sessions in each phase. Average number of sessions completed by the entire sample was 12.4 (SD 4.1) and by the completer sample was 14 (SD 2.6), from a total of 18 sessions. No differences were detected between completers and non-completers on any socio-demographic or baseline clinical measures.

Table 1 summarizes the baseline demographic characteristics for both groups. Preliminary analysis examined between-group differences in baseline sociodemographic, social cognitive, and clinical variables. There was no evidence of baseline group differences on any sociodemographic variables. On the social cognitive baseline measures, the only significant baseline difference was on

Table 1
Sociodemographic and clinical variables at baseline.

	SCIT (n=21) Mean (SD) (%)	TAU (n=16) Mean (SD) (%)	P
Age	40.6 (8.2)	37.4 (12.7)	357
Proportion of women	76.2%	50.0%	165
Diagnosis:			
BP type 1	71.4%	81.3%	712
BP type 2	14.3%	12.5%	
Schizoaffective	14.3%	6.3%	
Duration of illness (years)	13.4 (5.9)	13.2 (9.8)	931
Number of manic episodes	2.4 (1.2)	2.1 (1.1)	884
Number of depressive episodes	5.3 (3.4)	5.8 (3.6)	713
Number of hospitalizations	2.9 (2.6)	1.9 (1.4)	185
Educational attainment			107
Primary	33.3%	25.0%	
Secondary	47.6%	31.3%	
University	19%	12.5%	
Living status			298
Single	28.6%	56.3%	
Married	38.1%	31.3%	
Divorced	28.6%	12.5%	
Working status			381
Active	28.6%	50%	
Unemployed	47.6%	37.5%	
Pension	28.3%	12.5%	

Table 2
Social cognition and clinical outcome variables.

	Pre-treatment		Post-treatment		F-test Group effect	Effect sizes		
	SCIT mean (SD)	TAU mean (SD)	SCIT mean (SD)	TAU mean (SD)		Between-group (η_p^2)	Within-SCIT group (d)	Within-TAU group (d)
AIHQ:								
Hostility	2.05 (.58)	1.56 (.38)	1.78 (.43)	1.80 (.56)	7.11 [†]	18	-.55	.49
Intention	3.38 (.71)	3.04 (.74)	3.18 (.79)	3.16 (.61)	3.65	10	-.27	.17
Blame	3.07 (.73)	2.58 (.73)	2.92 (.81)	2.94 (.94)	12.84 ^{**}	28	-.19	.44
ER40	26.62 (4.92)	27.13 (6.23)	29.40 (6.15)	26.88 (5.98)	6.32 [†]	16	.51	-.04
FEDT	23.90 (3.95)	25.00 (2.22)	26.13 (2.55)	24.19 (2.34)	14.47 ^{**}	31	.67	-.36
FEIT	7.81 (4.29)	7.75 (3.44)	11.24 (4.18)	8.31 (5.06)	4.81 [†]	13	.81	.13
Hinting task	17.29 (2.94)	18.25 (1.29)	18.43 (2.73)	17.69 (1.35)	5.19 [†]	14	.40	-.42
HAMD	11.15 (7.46)	5.00 (5.84)	8.37 (6.18)	3.50 (3.43)	1.68	01	-.41	-.31
YOUNG	3.15 (4.78)	6.13 (4.77)	2.26 (3.87)	3.38 (3.90)	.62	02	-.21	-.63
GAF	76.37 (13.83)	81.94 (16.06)	82.14 (10.81)	82.00 (15.94)	.17	01	.47	.00
FAST	45.10 (14.28)	34.31 (17.32)	41.71 (15.13)	34.38 (18.67)	1.30	04	-.23	.00

[†] $p < .05$.

^{**} $p < .01$.

the AIHQ: Hostility Bias scores were higher in the SCIT group than the TAU group ($t(35)=2.98, p=005$). On clinical baseline measures, HAMD scores were higher in the SCIT group than in the TAU group ($t(35)=2.70, p=.011$). No other differences in baseline clinical measures reached statistical significance.

Table 2 summarizes descriptive data and ANCOVA results for each of the social cognitive and clinical outcome measures. There was a significant group effect on every social cognitive outcome measure save for the AIHQ Intentionality subscale, which approached significance ($p=069$). The magnitude of all between-group effect sizes for significant differences was large ($\eta_p^2 \geq .14$) and in the expected directions. Specifically, individuals who received SCIT showed a greater improvement in emotion perception and ToM, and a greater reduction in hostile attribution biases, than individuals who received TAU. Baseline HAMD scores were not a significant model component for any measure except the AIHQ Hostility Bias subscale ($p=01$), for which the between-group effect size of depressive symptoms was large ($\eta_p^2=.19$).

The SCIT group showed a small within-group decrease on the AIHQ Blame subscale, a moderate decrease in AIHQ Hostility Bias, a small increase in scores on the Hinting Task, a moderate increase on the ER40, and large increases on the FEDT and FEIT. Within-group TAU effect sizes were mixed, with moderate increases in AIHQ scores, a small increase in FEIT scores, and small to moderate decreases in ER40, FEDT, and Hinting Task scores.

There was no evidence for between-group effects on any clinical outcome measures. Each group showed small to moderate within group decrease in HAMD and YOUNG scores. The SCIT group showed a small within-group decrease in FAST scores and a moderate increase in GAF scores; by contrast, there were no apparent within-group changes in FAST or GAF scores for the TAU group. Post-hoc analysis with the four schizoaffective participants excluded yielded a similar pattern of results, with the notable exception that there was no longer a significant group effect on AIHQ Intentionality or FEIT scores. Post-hoc analysis of treatment completers also revealed a single change to the overall pattern of results: the group effect on the Hinting Task merely approached significance in the completer analysis ($p=054$).

4. Discussion

Numerous studies have revealed that social cognition is a modifiable domain that may be improved by SCIT in individuals with schizophrenia across a variety of clinical settings and patient

samples (Penn et al., 2005; Combs et al., 2007; Roberts and Penn, 2009; Tas et al., 2012). The results of this trial partially supported our hypothesis that SCIT would improve social cognition and social functioning in individuals with bipolar and schizoaffective disorder. Individuals who received SCIT+TAU showed significant improvement in emotion perception and theory of mind, as well as a significant reduction in hostile attribution bias relative to those who received TAU. To our knowledge, this is the first controlled study on social cognition training for affective disorders, providing preliminary evidence that SCIT is feasible among bipolar and schizoaffective outpatients and may improve social cognition.

Although SCIT was associated with an improvement in various aspects of social cognition, no improvement in social functioning was observed. This is in contrast to previous research on SCIT in other disorders (Combs et al. 2007; Roberts and Penn, 2009). It is possible that SCIT needs to be modified to differentially target the profile of social cognitive impairments in bipolar disorder. Individuals with bipolar disorder show marked negative attributional style that are better assessed implicitly (Lyon et al., 1999), and neuroimaging results suggest that individuals with affective disorders may have greater trouble with social cognitive tasks that engage higher-order cognitive regions (Cusi et al., 2012). Consequently, SCIT interventions with individuals with bipolar disorder might benefit from tasks involving comprehension of more complex social situations and implicit measures of attributional style, with less emphasis on tasks such as straightforward facial expression recognition which engage lower-order cognitive processes. An alternative interpretation of these results is that SCIT may improve functional outcomes related to social skills (as typically measured in role play tasks) rather than global functioning, as measured in this study. More ecologically valid measures of social functioning may be useful in assessing the outcomes of social cognitive interventions. This is clearly a critical issue to explore in future research.

This study had a number of strengths: raters were blind to treatment assessment, attendance was high, and we employed measures that have been well-established in schizophrenia research. There were also notable limitations to this study. First, the design was quasi-experimental, since five subjects were reassigned after randomization (four from SCIT to TAU and one from TAU to SCIT). Second, the sample was heterogeneous, as both groups comprised individuals with bipolar I and II disorder, as well as schizoaffective disorder; post-hoc analysis suggests that this inclusion did not substantially affect outcomes. Third, no follow up assessment was conducted, so it is unknown whether the effects of SCIT persist over time. Subthreshold affective symptoms, neurocognitive impairments and medication seem to be the main confounding factors in the assessment of social cognition in BD. Our sample did not fill strict criteria of euthymia, and measures for attention or executive functions and for medication status were not included. These methodological issues should be addressed in future clinical trials on the efficacy of social cognition training for bipolar patients.

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Conflict of interest

All other authors declare that they have no conflict of interest.

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