Schizophrenia Research 128 (2011) 177–178

Contents lists available at ScienceDirect

Schizophrenia Research

journal homepage: www.elsevier.com/locate/schres

Letter to the Editor

An examination of social cognition, neurocognition, and symptoms as predictors of social functioning in schizophrenia

Dear Editors,

Social cognition has emerged as an important construct in schizophrenia. Previous research has shown that social cognition functions as a direct predictor, mediator, or moderator of social functioning (as reviewed in Wölwer et al., 2010). In particular, the ability to recognize different emotional expressions (i.e., emotion perception) is linked to social functioning, which is one reason why social cognition has become the focus of intervention studies (Penn et al., 2006). Quite simply, persons who can recognize emotions more accurately often have better social and occupational performance (Combs and Gouvier, 2004). However, the importance of social cognition is often clouded by other constructs such as neurocognition and positive and negative symptoms which overlap (Sergi et al., 2007; Combs et al., 2008; Penn et al., 2000). Both empirical research and theoretical models reflect the importance of each construct, but more research is needed to understand how these variables function when examined in combination (see Green et al., 2008; Meyer and Kurtz, 2009; Pinkham and Penn, 2006).

In this study, we took a broad approach to understanding social functioning by examining the role of emotion perception, neurocognition, psychiatric symptoms, and general visual perception as predictors of social mixing behaviors among a sample of 65 inpatients with schizophrenia. Based on previous research, we predicted that emotion perception would emerge as a significant individual predictor of social functioning based on partial correlation values. We also wanted to explore the role of neurocognition, psychiatric symptoms, and general visual and facial perception as unique individual predictors of social functioning.

Participants were 65 inpatients with SCID-derived DSM-IV-TR diagnoses of schizophrenia. Participants were community dwelling residents who were hospitalized for symptom exacerbations. Participants completed the SCID, Brief Psychiatric Rating Scale (BPRS; factor scores of thought disorder, anergia, disorganization, and affect), Repeatable Battery for the Assessment of Neuropsychological Status (RBANS; index scores of immediate and delayed memory, attention, language, and visual spatial processing), Trail Making Test (time in seconds parts A and B), Face Emotion Identification Test (FEIT, total score), Benton Visual Form Recognition Test (total score), and the Benton Test of Facial Recognition (short form total score). Two reliably trained, blinded staff raters (out of 4 possible raters; ICC's = .80+) completed the Social Behavior Scale, and we focused our analyses on the social mixing subscale, which measures the ability of the participants to engage and interact with others (Combs et al., 2008; mean scores range from 0 to 4 and lower scores indicate better social mixing).

Neither the demographic (age, education, gender, and ethnicity) nor clinical variables (length of illness, and medication dosage) were significantly correlated with social mixing behaviors (all r values < .20, *ns*) and were excluded from the regression analysis. All IV's were entered simultaneously and resulted in the generation of a linear function to predict social mixing scores which reflect non-overlapping relationships between the IV and DV's. Tolerances for the predictor variables were acceptable (in general, correlations between the IV's ranged from −.3 to +.4) indicating minimal multicollinearity. The overall regression model was significant and accounted for 46% of the variance in social mixing scores with all predictors entered, F (14, 40) = 2.3, $p = .02$, $R = .681$. The adjusted R^2 was 26%, which reflected the influence of sample size on the regression results. Significant individual predictors of social mixing based on partial correlation values included the FEIT (emotion perception), RBANS Attentional Index, and the RBANS Language Index (see Table 1 for values). Based on the observed relationships, higher emotion perception and better language abilities were related to more adaptive social mixing behaviors as judged by the raters. In contrast, poorer attention was related to better social mixing scores.

The current data provides continued support for the role of social cognition and neurocognition in social functioning. Symptoms played a lesser role in social functioning, but it is possible that these measures contained more error, thus reducing their significance. Nevertheless, social cognition appears to be robust in terms of its relationship with social functioning and is considered more proximal to real world social interactions. In our sample, better emotion perception skills predicted social interaction skills as assessed by trained raters (with a similar result for language skills). The relationship between attention and social mixing was unexpected, given previous research on the role of attention and visual processing in social and emotion perceptions (Combs and Gouvier, 2004). It is possible that this finding may reflect the increased staring behaviors found in persons with schizophrenia when viewing faces (Green et al., 2005). Perhaps the staff misinterpreted these staring behaviors during social interactions as appropriate social behaviors. Also, the content of the RBANS attentional index items (digit span and coding) may have captured different aspects of attention in

0920-9964/$ – see front matter
doi:10.1016/j.schres.2010.11.019

Table 1
Regression results for the prediction of social mixing ($N = 65$).

Model	R	R^2	Adj. R^2	F	p value
1	.681	.461	.26	2.3	.02
Predictor variables		Beta (β)	t value	Part correlation values	Zero correlation values
FEIT		−.27	2.03*	.26*	.28*
RBANS attention		.43	2.81*	.34*	.29*
RBANS language		−.45	2.93*	.35*	.12
RBANS immediate memory		.07	.42	.05	.06
RBANS delayed memory		.02	.14	.01	.04
RBANS visual spatial		.16	1.14	.13	.17
Trail making test, part A		−.11	.51	.06	.14
Trail making test, part B		−.04	.17	.02	.15
BPRS thought disorder		−.25	1.70	.20	.28*
BPRS anergia		−.01	.12	.01	.09
BPRS disorganization		.14	.90	.11	.04
BPRS affect		−.24	1.65	.20	.19
Visual form discrimination test		.21	.96	.17	.14
Test of facial recognition		.14	1.43	.11	.01

Note. FEIT = Face Emotion Identification Test; RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; BPRS = Brief Psychiatric Rating Scale.
*$p < .05$.

contrast to vigilance or selective attention often measured in other studies (e.g., Trails A as a measure of visual or selective attention was not significant). In conclusion, the results of this study continue to support the increased focus of social cognition and neurocognition in schizophrenia.

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1 October 2010