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Social affiliation and negative symptoms in schizophrenia: Examining the role of behavioral skills and subjective responding

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ABSTRACT

Schizophrenia is characterized by profound impairment in the motivation for social affiliation. Negative symptoms are associated with such impairment but the contribution of behavioral skill deficits is unclear. In this study we utilized a novel video paradigm to assess performance-based affiliative behavioral skills in individuals with schizophrenia ($N = 48$) and community controls ($N = 29$). Individuals with schizophrenia displayed significant impairment in behavioral affiliative skills compared to controls; however, in response to the affiliative interaction the groups did not differ on self-reported affective responding, appraisal of the interaction partner, or desire to interact with the partner in the future. Importantly, within the patient group more severe negative symptoms (particularly those related to motivation and pleasure) were associated with poorer affiliative social skills and this relationship was independent of instrumental (non-social) skills, depression or positive symptoms. More severe negative symptoms were also associated with less positive affect in response to the interaction and less positive appraisals of the interaction partner. Self-reported social anhedonia was related to patients' diminished willingness to interact with the partner in the future. These results demonstrate that negative symptoms in schizophrenia are related to both affiliative skill deficits and less affiliative subjective responses to interaction partners.

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1. Introduction

Negative symptoms, such as anhedonia, amotivation and asociality, are one of the most debilitating aspects of schizophrenia (Herbener and Harrow, 2004; Buchanan, 2007; Rabinowitz et al., 2012). Factor analytic studies have found that negative symptoms can be parsimoniously explained by two factors—diminished expression and diminished motivation and pleasure (Blanchard and Cohen, 2006; Horan et al., 2011; Strauss et al., 2012). Deficits in motivation and pleasure have particular implications for role functioning in the community (e.g., Green et al., 2012; Kring et al., 2013) and may manifest as disruptions in the engagement of positive social interactions with others (i.e., social affiliation) (NIMH, 2012).

The social affiliative deficits reflected in negative symptoms may in part arise from, or contribute to, impairments in social skill. Social skills involve verbal and nonverbal behavior that are essential for the initiation and success of affiliative interactions, and an accumulation of research has shown profound social skill deficits in schizophrenia (e.g., Liberman et al., 1986; Mueser et al., 1990, 2010) leading to interventions to improve these skills (e.g., Granholm et al., 2007; Granholm

et al., 2014; Kurtz et al., 2015). However, when assessing social skill within an interpersonal context, typically through the use of a role play, the association between these behavioral skill ratings and negative symptoms has been inconsistent. While some studies have found that greater negative symptoms are associated with poorer social skill (Mueser et al., 1990; Bellack et al., 1990; Addington and Addington, 1999; Couture et al., 2011a, 2011b; Robertson et al., 2014), other studies have failed to find an association between social skill and negative symptoms (Mueser et al., 1991; Blanchard et al., 1994; Bowie et al., 2010). For example, Bowie et al. (2010) observed that symptoms, including negative symptoms, do not appear to influence the ability to perform social skills but rather the likelihood of performing those skills in the community.

In considering the mixed findings regarding the association between social skill and negative symptoms, it may be informative to consider methodological issues relating to the assessment of both of these domains. Prior studies have utilized measures of negative symptoms that may have limitations in terms of their capacity to assess experiential deficits in interests, motivation, and pleasure that are central to the construct of affiliation (Blanchard et al., 2011). Further, prior studies have often utilized a single summary score of negative symptoms. As noted above, recent research has indicated that negative symptoms are best characterized by two major facets involving deficits in motivation and pleasure and a separate facet of expressive deficits reflecting

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blunted affect and alogia (Blanchard and Cohen, 2006; Horan et al., 2011; Strauss et al., 2012). It may be important to explore the potential differential contribution of experiential and expressive negative symptoms to behavioral skill deficits. For example, Rocca et al. (2014) found that avolition-related symptoms were more strongly associated with functional impairment than expressive deficits. To address these issues, the current study assessed negative symptoms using the Clinical Assessment Interview for Negative Symptoms (CAINS; Horan et al., 2011; Kring et al., 2013). The CAINS is a recently developed semi-structured interview that evaluates the two factors of negative symptoms while providing a more direct assessment of experiential deficits associated with motivation and pleasure (including consummatory and anticipatory pleasure) than is provided by other instruments (Blanchard et al., 2011).

Another consideration is that prior studies of social skill in schizophrenia typically involve behavioral interactions that may lack positive affective features that are central to affiliation. Role play assessments often include conflict-oriented or problem-solving scenes (Bellack et al., 1994) that are by their nature not affiliative. Further, when existing role-play assessments include affiliative goals (e.g., getting to know a new neighbor), the role plays often place the burden of maintaining the conversation on the participant (Bellack et al., 1994; Sayers et al., 1995; Patterson et al., 2001), discourage confederates from displaying positive affect (Patterson et al., 2001), and typically do not induce positive affect even in healthy participants in a manner that would be expected from an affiliative interaction (Horan and Blanchard, 2003). The use of affiliative skill assessments could be important to examine in schizophrenia. Affiliative deficits are by definition related to positive social interactions that involve different emotional experiences and behavioral displays than those involved in problem solving or conflictual interactions. We have previously noted (Blanchard et al., 1994; Llerena et al., 2012) that individuals high in social anhedonia may have skill deficits that are specific to affiliative interactions.

A final issue in the interpretation of existing findings centers on the subjective response to affiliative interactions in schizophrenia. As suggested by Bowie et al. (2010), negative symptoms may impact the probability of employing social skills in the community rather than the skills themselves. The choice to engage in affiliative behavior may in part be derived from the individual's expectation or experience of pleasure or reward from the social encounter. Laboratory evocative studies would suggest that hedonic responding is intact in schizophrenia (Cohen and Minor, 2010; Kring and Caponigro, 2010; Kring and Elis, 2013). However, caution is appropriate in extrapolating from these laboratory studies to affiliative interactions. When assessing deficits in emotional experience in schizophrenia, mood-induction laboratory studies have generally relied on stimuli that lack a social affiliative component, such as film clips, picture slides, or flavored drinks (Cohen and Minor, 2010). Beyond changes in positive affect, it would be informative to examine how negative symptoms are related to other subjective responses that relate to the likelihood of affiliation including positive appraisals of the interaction partner (e.g., trusting or liking the partner) or willingness to interact with the partner in the future. We are not aware of any studies that have directly examined subjective responses to standardized affiliative skill assessments in schizophrenia to determine if negative symptoms might contribute to deficits in affiliative subjective responding.

In order to better examine affiliative social skills, we recently developed a novel task that involves a highly affiliative interaction partner presented on video (Llerena et al., 2012). Participants are asked to respond to the video as they would in a real social interaction. Initial results indicate that this task is sensitive to individual differences in social anhedonia within a nonclinical sample (Llerena et al., 2012). Specifically, compared to controls, individuals with elevated social anhedonia were less skilled in this affiliative task, reported less change in positive affect, had less positive reactions to the interaction partner, and were

less willing to engage in future hypothetical interactions with the partner (Llerena et al., 2012). These findings indicate that anhedonia may manifest in diminished social affiliative skill as well as in altered subjective affiliative reactions. It remains to be determined if these findings from a nonclinical sample can be replicated in individuals with schizophrenia with elevated negative symptoms.

The aims of the current study are three-fold. First, we sought to examine performance-based social affiliative skill in individuals with schizophrenia using a novel video task (Llerena et al., 2012). We hypothesized that individuals with schizophrenia would demonstrate poorer social affiliative skill as compared to controls. Second, we examined the association between deficits in affiliative skills and clinician-rated negative symptoms and self-reported social anhedonia in schizophrenia. We hypothesized that greater negative symptoms would be associated with poorer affiliative social skills. We also explored whether the two domains of negative symptoms (motivation and pleasure, expression) would be differentially associated with social skill. Relatedly, we expected that this association between negative symptoms and affiliative skill would be independent of functional (non-social) skill impairment and depressive symptoms. Finally, we examined subjective affiliative responding related to the partner in the affiliation video task. We hypothesized that, given their focus on experiential deficits, greater negative symptoms of motivation and pleasure would be associated with less change in positive affect during the role play and less affiliative reactions to the interaction partner.

2. Methods

2.1. Participants

The sample consisted of 48 individuals with schizophrenia or schizoaffective disorder and 29 nonpsychiatric controls. Participants with schizophrenia were recruited from outpatient mental health clinics affiliated with a division of community psychiatry at a public university (92% of the sample) and a Veterans Administration Medical Center (8%). Participants with schizophrenia were identified by either chart review or referral by a mental health clinician and met the following inclusion criteria: (1) diagnosis of schizophrenia or schizoaffective disorder based on SCID interview; (2) 18–64 years of age; (3) ability to read; and (4) willingness to provide consent. Exclusion criteria for participants with schizophrenia were: (1) DSM-IV diagnosis of any Axis I psychiatric disorder other than schizophrenia or schizoaffective disorder; (2) DSM-IV diagnosis of alcohol or drug dependence in the last 6 months or DSM-IV diagnosis of alcohol or drug abuse in the last month; (3) history of significant head injury, defined as a head injury followed by loss of consciousness for more than 1 h, recurring seizures, clear cognitive sequelae, and/or need for cognitive rehabilitation; (4) history of neurological disease such as Parkinson's, multiple sclerosis, seizure disorder, stroke; (5) intellectual disability as indicated by clinical chart review; (6) inability to provide informed consent; or (7) inability to participate due to intoxication or escalation of psychiatric symptoms at the time of assessment resulting in disruptive or aggressive behavior. Other than diagnosis, all inclusion and exclusion criteria were evaluated via a review of the individual's clinical record.

Control participants were recruited via flyers advertised in several buildings around the investigators' research offices and via word of mouth from control participants once their participation was completed. Inclusion criteria for control participants were age 18–64 years and willingness to participate. Control participants were screened with the SCID and excluded if they met criteria for any DSM-IV Axis I psychiatric disorder, a DSM-IV diagnosis of alcohol or drug dependence in the last 6 months, or a DSM-IV diagnosis of alcohol or drug abuse in the last month. Additional exclusion criteria for control participants included history of significant head injury, neurological disease, and mental retardation as outlined above and determined via self-report. Personality disorders were not assessed.

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