



Attribution bias and social anxiety in schizophrenia



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ABSTRACT

Studies on attribution biases in schizophrenia have produced mixed results, whereas such biases have been more consistently reported in people with anxiety disorders. Anxiety comorbidities are frequent in schizophrenia, in particular social anxiety disorder, which could influence their patterns of attribution biases. The objective of the present study was thus to determine if individuals with schizophrenia and a comorbid social anxiety disorder (SZ+) show distinct attribution biases as compared with individuals with schizophrenia without social anxiety (SZ−) and healthy controls. Attribution biases were assessed with the Internal, Personal, and Situational Attributions Questionnaire in 41 individual with schizophrenia and 41 healthy controls. Results revealed the lack of the normal externalizing bias in SZ+, whereas SZ− did not significantly differ from healthy controls on this dimension. The personalizing bias was not influenced by social anxiety but was in contrast linked with delusions, with a greater personalizing bias in individuals with current delusions. Future studies on attribution biases in schizophrenia should carefully document symptom presentation, including social anxiety.

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Anxiety disorders are increasingly recognized as important comorbidities in schizophrenia, with a recent meta-analysis reporting a mean prevalence rate of 38.3% (Achim et al., 2011). Among these comorbid anxiety disorders, social anxiety disorder (SAD) is the most prevalent (Achim et al., 2011; Roy et al., 2015) and is associated with reduced functioning and quality of life (Pallanti et al., 2004; Voges and Addington, 2005). Moreover, individuals presenting with schizophrenia and SAD (SZ+) have lower self-esteem (Gumley et al., 2004; Karatzias et al., 2007), increased active social avoidance (Sutliff et al., 2015) and increased rates of suicide (Pallanti et al., 2004) in comparison to individuals with schizophrenia without this comorbidity (SZ−). Although a paucity of studies have investigated cognitive symptoms of SZ+ and SZ− individuals, a study from our team reported that SZ+ individuals presented with less severe cognitive/disorganisation symptoms (assessed via the PANSS) than SZ− individuals (Sutliff et al., 2015). Another study also highlighted better performance in some areas of social cognition in SZ+ individuals compared to SZ−, particularly for social knowledge (Achim et al., 2013). However, social cognition biases could be of particular relevance relative to other social cognition deficits in SZ+ given that individuals with primary anxiety disorders (without

schizophrenia) tend to present with social cognition biases (Arkin et al., 1980; Hope et al., 1989; Plana et al., 2014).

Attribution style, or the tendency to explain the cause of events in terms of oneself, others, or in relation to a situation, has been frequently studied independently both in social anxiety and in schizophrenia. This construct has also been investigated in healthy subjects and results suggest that a self-serving bias is best explained as the tendency to attribute negative events to external causes and attribute positive events to one's doing (Miller and Ross, 1975). While different instruments can be employed to assess attribution style, the Internal, Personal and Situational Attributions Questionnaire (IPSAQ) (Kinderman and Bentall, 1997) is gaining increasing interest to examine two types of attribution biases: (1) an externalizing bias (also known as a self-serving bias), or the tendency to attribute positive rather than negative events to oneself; and (2) a personalizing bias, or the tendency to attribute negative events to others rather than to the context of a social situation. While some earlier studies have reported more important attribution biases in schizophrenia than controls (Aakre et al., 2009; Kaney and Bentall, 1992; Lyon et al., 1994), others have not replicated these findings (Donohoe et al., 2008; Langdon et al., 2013), and in fact, a recent meta-analysis (Savla et al., 2013) found only a negligible effect size of both externalizing and personalizing biases in schizophrenia as compared to controls across studies. However, cognitive models of delusions have highlighted the importance of attribution biases in forming and sustaining persecutory and delusional symptoms (Bentall et al., 1994; Freeman et al., 2002; Garety and Freeman, 1999). Recent studies have

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associated delusions (Diez-Alegria et al., 2006; Langdon et al., 2006) and suspiciousness (Langdon et al., 2013) with externalizing biases. Thus, symptom profiles may be potential confounders in the heterogeneous results of attribution bias studies in schizophrenia. Additionally, given that negative beliefs about the self are common symptoms of SAD (Clark and Wells, 1995) and have also been associated with persecutory delusions (Smith et al., 2006), comorbid SAD may also be an important factor in further understanding these biases in schizophrenia. Particularly, individuals with social anxiety are reported as demonstrating more negative attribution biases and reduced self-serving biases (Arkin et al., 1980; Hope et al., 1989; Plana et al., 2014). This suggests that SZ+ individuals may also present with a different attribution style in comparison to SZ– and controls, which could be related to the symptom profiles of these individuals.

The objective of the present study is to determine if SZ+ individuals show distinct patterns of attribution biases as compared to SZ– individuals and healthy controls. We hypothesize that overall, the SZ– group will not show significant differences in externalizing or personalizing biases compared to controls. However, the SZ+ group should show a lesser externalizing (self-serving) bias compared to the other groups, which will be related to persecution and delusion symptom scores.

1. Participants

Forty-one individuals with a recent-onset schizophrenia spectrum disorder were recruited from a first-episode psychosis clinic, the Clinique Notre-Dame-des-Victoires in Quebec City. Diagnoses included schizophrenia ($N = 31$), schizoaffective disorder ($N = 3$), delusional disorder ($N = 4$), schizophreniform disorder ($N = 1$) and psychosis not otherwise specified ($N = 1$). All participants were receiving second-generation antipsychotic medication at the time of the assessment. The mean duration of illness was 25.1 months.

Forty-one healthy participants were recruited as a control group. They did not significantly differ from the SZ+ or SZ– individuals in terms of age, gender composition or parental socio-economic status as evaluated with the Hollingshead two-factor index of social position (Miller, 1991).

2. Clinical assessment

Clinical assessment of SAD was done using a semi-structured interview based on the SCID-IV, but which also included a more comprehensive assessment of symptomatology using the questions from the Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987), and importantly, the Liebowitz Social Anxiety Scale (LSAS) (Liebowitz, 1987), which allows for a more sensitive detection of social anxiety symptoms (Achim et al., 2015; Roy et al., 2015). Based on this interview, individuals with schizophrenia were divided into two

subgroups: those meeting the diagnostic criteria for a comorbid SAD (SZ+ subgroup, $N = 12$) and those not presenting with a current SAD (SZ– subgroup). All DSM-IV criteria were considered when making these diagnoses, but individuals were included in the SZ+ group even if they did not recognize that the fear/anxiety was out of proportion (no longer a SAD criterion in DSM-5).

3. Attribution biases

Attribution biases were measured with the brief-IPSAQ (Internal, Personal, and Situational Attributions Questionnaire, (Kinderman and Bentall, 1997)). The brief-IPSAQ involves presenting sixteen hypothetical events (8 positive and 8 negative) involving a friend. For each item, participants are asked to state the most likely cause of the situation, determining if this cause is linked to them, the friend or the situation. Two cognitive bias scores are then derived: The *externalizing bias* (calculated as the number of internal attributions for positive events minus internal attributions for negative events) and the *personalizing bias* (calculated as the number of personal external attributions for negative events divided by the number of personal plus situational external attributions for negative events).

Sociodemographic information and ratings from this study are presented in Table 1.

4. Externalizing (self-serving) bias (EB)

An ANOVA was first conducted to compare EB scores on the brief-IPSAQ between SZ+ individuals, SZ– individuals, and control participants. The overall group effect was not statistically significant, but results nonetheless showed a statistical trend ($F(2,79) = 2.16$, $p = .12$). Given our a priori hypothesis of an effect of anxiety on attribution biases and the small sample size, we conducted paired group comparisons between the three groups. This analysis revealed a significant group difference between SZ+ and controls ($t(51) = -2.3$, $p = .03$), with the SZ+ group showing a significantly lower externalizing bias than controls. The SZ– group did not differ from the controls ($t(68) = -0.8$, $p = .42$) or from the SZ+ ($t(39) = 1.3$, $p = .20$), showing an intermediate score between controls and SZ+.

5. Personalizing bias (PB)

The ANOVA between the three groups (SZ+, SZ– and controls) revealed no significant group effect on the PB scores ($F(2,79) = 0.39$, $p = .68$). However, an exploratory comparison between schizophrenia individuals presenting with current symptoms of delusions ($N = 27$ with PANSS score >2) and those without delusions ($N = 14$ with PANSS ≤ 2) revealed a greater personalizing bias in the former group (mean = .58) than in the latter (mean = .29) ($t(39) = 2.78$, $p = .008$).

Table 1
Demographic information, symptoms and attribution bias scores.

	All SZ ($n = 41$)	SZ– ($n = 29$)	SZ+ ($n = 12$)	HC ($n = 41$)	Subgroup comparisons ^a
Age	25.46 (4.54)	25.38 (4.84)	25.67 (3.94)	25.10 (4.32)	N.S.
Gender (M:F)	6:35	3:26	3:9	11:30	N.S.
SSE	3.63 (1.10)	3.54 (1.11)	3.83 (1.12)	3.44 (1.00)	N.S.
PANSS delusion	3.10 (1.36)	3.03 (1.50)	3.25 (0.97)	–	N.S.
PANSS suspiciousness/persecution	2.54 (1.10)	2.21 (0.98)	3.33 (0.98)	–	SZ+ > SZ–
IPSAQ					
Externalizing bias	0.85 (2.70)	1.21 (2.85)	0.00 (2.17)	1.71 (2.35)	HC, SZ– > SZ+
Personalizing bias	0.49 (0.34)	0.51 (0.35)	0.41 (0.34)	0.50 (0.33)	N.S.

SZ = schizophrenia; SZ– = schizophrenia without a comorbid social anxiety disorder; SZ+ = schizophrenia with a comorbid social anxiety disorder; HC = healthy controls; PANSS = Positive and Negative Symptom Scale; IPSAQ = Internal, Personal, and Situational Attributions Questionnaire.

^a Meeting a two-tailed $p < 0.05$.

6. Correlations with symptoms

Neither the externalizing bias scores nor the personalizing bias scores significantly correlated with the PANSS ratings for delusions (items p1) or suspiciousness/persecution (item p6) for the schizophrenia group as a whole. However, when correlations were conducted separately in the two subgroups, significant associations emerged only for the SZ+ group. Specifically, in the SZ+ group, the PB was significantly correlated with delusions ($r = .64$, $p = .02$) whereas a negative trend was found between the EB and suspiciousness/persecution symptoms ($r = -.55$, $p = .06$).

7. Conclusion

This study confirmed that individuals with schizophrenia who also present with SAD (SZ+ individuals) lack the normal externalizing bias (EB) observed in most healthy people. This observation is consistent with previous results in individuals with social anxiety (without schizophrenia) (Arkin et al., 1980; Hope et al., 1989) and differs from studies in schizophrenia that found an elevated EB (Aakre et al., 2009; Kaney and Bentall, 1992; Lyon et al., 1994).

Furthermore, the personalizing bias (PB) was linked to symptoms of delusions but showed no differences related to comorbid SAD. Although it has been suggested that people with persecutory delusions show increased biases in general (Bentall et al., 1994; Kinderman and Bentall, 1997; Martin and Penn, 2002), the results here suggest that different biases are rather linked to specific symptom presentations. More specifically, delusions seem linked to increased biases, in particular PB, while social anxiety was linked to decreased EB in this study. It is possible that individuals with schizophrenia with or without social anxiety differ in terms of the type of delusions that they present with, which could account for the greater persecution ratings in SZ+. The current study is however limited by a small sample size, particularly for our SZ+ group, and would deserve replication in a larger study. Future studies on cognitive biases should carefully document psychotic symptom presentation, including types of delusions, as well as common comorbid symptoms, such as social anxiety and depression.

Conflict of interest

All authors declare that they have no conflicts of interest to report.

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