Assessment of empathy in first-episode psychosis and meta-analytic comparison with previous studies in schizophrenia

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ABSTRACT

Empathy is a multidimensional construct that relies on affective and cognitive component processes. A few studies have reported impairments of both cognitive and affective empathy components in patients with schizophrenia. It is, however, not known whether these difficulties are already present at psychosis onset. The affective and cognitive components of empathy were thus assessed in 31 patients with first-episode psychosis (FEP) and 31 matched healthy controls using the Interpersonal Reactivity Index (IRI). Our results were then compared to previous studies of empathy in patients with more chronic schizophrenia via a meta-analysis. In addition, we also assessed the relationship between empathy ratings, Mentalizing performance and clinical symptoms. Contrary to what has been reported in people with more chronic schizophrenia, the IRI ratings did not significantly differ between FEP and controls in our study, though a trend was observed for the Personal distress scale. For the Perspective taking scale, our meta-analysis revealed a significantly lower effect size in this study with FEP patients relative to previous schizophrenia studies. In the FEP group, the IRI ratings were not related to positive, negative or general psychopathology symptoms, but a significant relationship emerged between the Liebowitz Social Anxiety Scale and Perspective taking (negative correlation). In addition, a significant positive correlation was observed between the Empathic concern subscale and our theory of mind task. This study supports the idea that the cognitive component of empathy is less affected in patients with first-episode psychosis relative to patients with more chronic schizophrenia, and the impairments reported in previous reports with more chronic populations should be interpreted in light of a possible deterioration of this cognitive skill. The findings also provide some insight into the relationship between empathy and clinical symptoms such as social anxiety.

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1. Introduction

Empathy is a set of interrelated processes that allow us to understand and respond to the affective experiences of others, and thus support interpersonal relationships. Although the diverse empathy models include a number of different processes within this construct, most distinguish an affective sharing component from a more cognitive perspective taking component (Davis, 1983; Decety and Jackson, 2006; Decety et al., 2007). In addition, these two components are likely regulated by executive/regulatory mechanisms (Decety and Jackson, 2006; Decety et al., 2007).

In recent years, a few studies have reported abnormal empathic abilities in people with schizophrenia (Montag et al., 2007; Shamay-Tsoory et al., 2007a,b; Bora et al., 2008; Fujiwara et al., 2008; Derntl et al., 2009; Haker and Rossler, 2009), in line with the impairments observed in social functioning, including social competence and interpersonal relationships (Green, 1996; Yager and Ehmann, 2006). These studies on empathy have consistently revealed decreases in self-reported cognitive empathy processing in schizophrenia (Montag et al., 2007; Shamay-Tsoory et al., 2007b; Fujiwara et al., 2008). For the affective component of empathy, most studies have reported increases in ratings of self-oriented feelings of Personal distress in response to the negative experiences of others (Montag et al., 2007; Fujiwara et al., 2008; Derntl et al., 2009), whereas none of these studies reported significant group differences in the ratings of other-oriented feelings of sympathy and concerns for unfortunate others.

Since empathy relies on a number of complex cognitive and affective mechanisms, and in light of the literature that shows that cognition and social functioning are often exacerbated over the course of schizophrenia illness (e.g. Kucharska-Pietura et al., 2005), the question of whether empathy impairments are related to the progression of the disease needs to be clarified. One study has assessed the relationship between duration of illness and the ratings

of the cognitive component of empathy in schizophrenia and has reported a significant decrease in Perspective taking ratings with increased duration of illness (Montag et al., 2007), suggesting that the cognitive component of empathy could be less affected in the early stages of the illness. Duration of illness did not however have a significant impact on other aspects of empathy such as the self-oriented and other-oriented affective empathy components (Montag et al., 2007), or on global empathy ratings (Bora et al., 2008).

The objectives of this study were 1) to assess cognitive and affective aspects of self-reported empathy in people with a first-episode of psychosis compared to healthy controls, and 2) to compare these results with previous studies in patients with more chronic schizophrenia using a meta-analytic approach. Based on previous results in people with schizophrenia, we expected to observe increased ratings of personal distress (self-oriented affective empathy component) in first-episode psychosis (FEP) compared to a group of healthy controls since this component of empathy is affected in schizophrenia (SZ) and does not seem related to duration of psychosis. We further expected reduced ratings on the cognitive empathy component, most specifically Perspective taking, but with a more modest effect size relative to what have been reported in more chronic schizophrenia samples because previous results indicate that cognitive empathy likely deteriorates with the progression of illness. In addition, we aimed to examine the relationship between empathy self-ratings and 1) the performance on a Mentalizing task, a cognitive construct related to empathy (Decety et al., 2007), and 2) clinical symptoms in people with first-episode psychosis. Previous studies in people with schizophrenia have observed negative associations between empathy ratings and negative symptoms (Shamay-Tsoory et al., 2007a,b). The empathy measures used in these previous studies were, however, composite scores that did not allow distinguishing between cognitive and affective components of empathy. One of the empathy scales that showed such a relationship, the Questionnaire Measure of Emotional Empathy (QMEE; Mehrabian and Epstein, 1972), however, focuses mainly on affective aspects of empathy, suggesting that affective empathy ratings are linked to negative symptoms. We thus expected a relationship between negative symptoms and the Interpersonal Refractivity Index (IRI) affective empathy scales in our study. Since the recent empathy models also suggest the involvement of executive/regulatory mechanisms to control the affective reaction to other's distress (Decety and Jackson, 2006; Decety et al., 2007), we also expected to observe a relationship between affective empathy ratings and the level of social anxiety reported by our patients.

2. Methods

2.1. Participants

2.1.1. FEP group

Thirty-one (31) patients presenting with a FEP (mean age = 24.9 years, S.D. = 4.5; 26 men) participated in this study. Clinical characteristics of the patients are presented in Table 1. Patients were recruited from the Clinique Notre-Dame des Victoires (Quebec City, Canada), a specialized clinic that provides intensive and multidimensional care to young adults (18 to 35 years old) presenting with a first episode of schizophrenia spectrum psychosis. Diagnoses were established by the treating psychiatrist through a best-estimate diagnosis procedure, i.e., based on personal interview, family history from family informants, as well as direct reports from the rest of the clinical team and from medical records (Roy et al., 1997). Diagnostic and Statistical Manual for Mental Disorders-IV (DSM-IV) diagnoses included schizophrenia ($n = 23$, including $n = 15$ with paranoid SZ, $n = 3$ with disorganized SZ and $n = 5$ with undifferentiated SZ), schizoaffective disorder ($n = 2$), delusional disorder ($n = 4$), and psychosis not otherwise specified ($n = 2$). Our decision to include patients with this range of initial diagnoses was based on our objective to include a sample representative of all patients with a schizophrenia spectrum disorder, and on previous reports that these diagnoses fall within the schizophrenia spectrum when diagnoses are reassessed later in the illness process (Schimmelmann et al., 2005; Malla et al., 2006). However, patients were excluded if they had a history of neurological disorder or cranial trauma, if they presented with a physical handicap (e.g. visual) that could interfere with the testing, or if they presented an estimated IQ under 70 as assessed using a dyad form the Wechsler

Table 1
Demographic and clinical characteristics of the participants.

	FEP	Controls
Demographic characteristics[a]		
n	31	31
Gender (men/women)	26/5	26/5
Mean age (years)	24.9 (4.5)	25.2 (4.2)
Mean SES score	50.7 (18.2)	48.6 (14.2)
Mean SES category	3.7 (1.2)	3.6 (1.0)
Estimated IQ[b]	100.4 (15.1)	101.8 (10.5)
Symptoms ratings (means)		
PANSS positive	15.1	
PANSS negative	16.0	
PANSS general	32.0	
LSAS	42.2	
Medication (n/mean dose in mg)[c]		
Quetiapine	17/770.6	
Olanzapine	4/15	
Risperidone	3/2.3	
Risperidone Consta	3/25	
Combination	4/NA	

FEP = first-episode psychosis group.
SES = socio-economic status.
PANSS = Positive and Negative Syndrome Scale.
LSAS = Liebowitz Social Anxiety Scale.
NA = not applicable.
Combination = two of these antipsychotic medications.
[a] None of the demographic variables showed significant between group differences.
[b] IQ was estimated using the Wechsler Adult Intelligence Scale Third Edition [WAIS-III] Vocabulary and Blocks dyad (Ringe et al., 2002).
[c] Daily doses, except for Risperidone Consta administered every 2 weeks.

Adult Intelligence Scale (WAIS-III; Vocabulary and Blocks) (Ringe et al., 2002). Even though mild to moderate substance abuse or other comorbid Axis I symptoms or diagnoses can be highly prevalent in patients presenting with a psychosis (e.g. Achim et al., in press), patients were not excluded on this basis as we aimed to keep our patient sample as representative as possible of the whole population of FEP patients. All patients were taking a second-generation antipsychotic as their primary medication and were relatively stable. Antipsychotic treatment had been initiated following a first-episode of psychosis occurring on average 20.9 months prior to the study (median = 13.3 months, range = 1 to 57).

2.1.2. Control group

Thirty one (31) control subjects recruited from the general population through ads in local media or through word of mouth took part in the study. They were matched to the patients with respect to age (mean age = 25.2 years, S.D. = 4.2), gender (26 men) and parental socio-economic status (SES) as determined with the Hollingshead two-factor index of social position (Hollingshead, 1991). The exclusion criteria were the same as those for the FEP group, with the additional criteria of not presenting with a history of psychotic disorder or cluster A personality disorder as assessed with the relevant sections from the structured clinical interview for DSM-IV disorders (SCID-I and II; First et al., 1998). Although we did not specifically include assessment for other personality disorders in our study, there was no control subject in which such diagnosis was suspected. Additionally, none of the control subjects reported taking a psychoactive medication or having a first-degree relative affected with a psychotic disorder.

After a complete description of the study, all participants signed a consent form in accordance with the local ethics committee requirements.

2.2. Empathy questionnaire

Self-reported empathy was measured using the Interpersonal Reactivity Index (IRI; Davis, 1980). The IRI is divided into four scales that can be organized in two components of empathy, one cognitive and one affective. The two scales that reflect the cognitive aspects of empathy being measured are: 1) Perspective taking, which refers to the tendency to spontaneously adopt the psychological point of view of others, and 2) Fantasy, which taps the subject's tendencies to transpose themselves imaginarily into fictional situations.[1] The two scales that reflect the affective aspects of empathy measured

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[1] In line with recent studies by Shamay-Tsoory et al. (2007a,b), we decided to adopt the classification of Fantasy as a cognitive empathy component scale. This classification is, however, not explicit for this subscale in the original reports by Davis (1980, 1983). In contrast, Davis clearly states that Perspective taking is a cognitive ability and that Empathic concern and Personal distress assess emotional or affective aspects of empathy.

with the IRI are: 1) Empathic concern, which assesses the "other-oriented" feelings of sympathy and concerns for unfortunate others, and 2) Personal distress, which measures "self-oriented" feelings of personal stress and unease in tense interpersonal situations. Each of the four IRI scales includes seven items. Participants have to determine to what extent each statement describes them and rate each item on a five-point scale (from 0 – does not describe me well to 4 – describes me very well). The IRI was selected as a self-report measure of empathy for this study because its validity has been well documented (Davis, 1983) and because it distinguishes between the cognitive and affective components of empathy, which are two of the most widely recognized components of empathy (Shamay-Tsoory et al., 2007a,b).

2.3. Mentalizing task

Mentalizing was measured using Sarfati's comic strip task (Sarfati et al., 2003) that consists in a set of 28 short comic strips. Each comic strip is made of three pictures that present a character performing a series of simple actions. Participants have to consider the character's intention in order to select, from a set of three possible answer cards, which image depicts the most logical action that the character would next perform given the intention suggested by the sequence. For example, if a character brings a fishing gear next to the lake and then bends to look at the ground, he more likely intends to pick up worms than to pick up flowers or serve tea. One point is given for each good answer, for a maximum of 28 points. This task has previously revealed Mentalizing impairments in people with schizophrenia (Sarfati et al., 1997; Sarfati and Hardy-Bayle, 1999).

2.4. Clinical assessment

Clinical symptoms were assessed using the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987), a 30-item scale that is widely used to assess positive symptoms, negative symptoms, as well as general psychopathology. Each item of the PANSS was rated on a scale from 1 (Absent) to 7 (Extreme) by the treating psychiatrist according to well-defined criteria, and scores were computed for each of the three subscales (positive, negative and general psychopathology).

In addition, social anxiety symptoms were assessed with the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987), a 24-item scale that measures the level of anxiety and avoidance in a series of performance situations and other social settings. For each item, participants are asked to describe the level of anxiety that they would feel in the situation (rated from 0 − None to 3 − Severe) and to which extent they would avoid the situation (also rated from 0 − Never to 3 − Usually). This scale was added based on evidence that social anxiety disorder is a highly prevalent condition in people with schizophrenia (Pallanti et al., 2004; Achim et al., in press) and in first-episode psychosis (Roy et al., unpublished pilot data), and on evidence that patients with significant levels of social anxiety show poorer social adjustment (Pallanti et al., 2004), which could theoretically be linked to impaired empathic abilities.

2.5. Meta-analysis of previous studies of empathy in schizophrenia

In order to be included in the meta-analysis, the studies had to meet the following inclusion criteria: 1) published in English; 2) included a group of patients diagnosed with schizophrenia or another schizophrenia spectrum disorder (including schizoaffective disorder, delusional disorder and psychosis not otherwise specified) according to standardized criteria; 3) included a healthy control group; 4) administered the IRI to both groups; and 5) reported enough data to calculate the effect size of the difference between the schizophrenia group and the control group for each of the four IRI scales. In the case where only the last inclusion criterion was not met, the authors were contacted in order to obtain the relevant data. Studies meeting our inclusion criteria were identified through searches in "Pubmed" and "ISI Web of Knowledge" (years 1980 to 2009), and through careful inspection of the reference lists of the identified studies.

2.6. Analyses

Independent sample t-tests (two-tailed) were used for between-group comparisons between FEP and controls for the normally distributed measures, including each of the IRI scales. For the Mentalization task, for which ceiling effects were observed and normality of the distributions was not met, a Mann–Whitney test was rather used for the between-group comparison. Pearson correlations were performed to examine the association between empathy ratings and clinical symptoms in FEP, whereas Spearman tests were used for correlations with the Mentalizing task.

Meta-analytic computation of pooled effect sizes (weighted) between previous studies was performed following Rosenthal's approach (Rosenthal, 1984). Differences with the results from our study were assessed through direct comparison of the effect sizes, taking the effect size of each previous study into account (Achim and Achim, in preparation). Effect size r values were then transformed into Cohen's d to favor interpretation of the results.

3. Results

3.1. Demographic data

As shown in Table 1, FEP and controls were very well matched in terms of gender, age, and socio-economic status (SES). There was also no difference in estimated IQ between the two groups, which supports the idea that matching for parental socio-economic status helps to recruit controls that are representative of the whole general population, and helps make the groups more comparable in terms of general intellectual capacities.

3.2. Empathy ratings

None of the IRI scales showed a significant difference in ratings between FEP group and controls, though a trend was observed for the Personal distress scale ($t(60) = -1.85$, $p = 0.069$, Effect size (ES) $d = -0.48$), with more Personal distress being experienced in the FEP group. No significant differences were found for the two cognitive empathy scales, Perspective taking ($t(60) = 0.72$, $p = 0.477$) and Fantasy ($t(60) = 0.32$, $p = 0.750$), or for the Empathic concern scale ($t(60) = 0.24$, $p = 0.811$). Note that redoing the same analyses while keeping only the patients with a strict schizophrenia diagnosis to maximize the homogeneity of the sample did not change the pattern of results.

Table 2 presents the effect sizes computed from previous studies that assessed self-reported empathy using the IRI in patients with schizophrenia, as well as pooled effect sizes derived from this whole set of studies. This table shows that pooled effect sizes were in the moderate to large range for the Perspective taking scale ($d = 0.66$) and the Personal distress scales ($d = -0.68$), moderate for the Fantasy scale ($d = 0.45$) and small for the Empathic concern scale ($d = 0.21$). Also, direct comparison of effect sizes from these studies with those of the current FEP study for each IRI subscale revealed a significant difference for the Perspective taking scale ($\chi^2(1) = 2.74$, $p = 0.048$), but not for the other IRI scales.

3.3. Relationship between self-reported empathy and clinical variables in FEP

We assessed the relationship between each of the four empathy scales and each of the following measures: PANSS positive symptoms, PANSS negative symptoms, PANSS general symptoms social anxiety as measured with the LSAS and treatment duration. No significant correlation was detected between the IRI scales and the PANSS scores (all p-values > 0.2). We, however, observed a significant correlation between the Perspective taking scale and the LSAS ($r = -0.51$, $p = 0.004$), lower Perspective taking scores being associated with increased social anxiety, and a trend for a positive correlation between the Personal distress scale and the LSAS ($r = 0.32$, $p = 0.08$), higher Personal distress scores being associated with increased social anxiety. None of the IRI scales showed a significant relationship with treatment duration (all ps > 0.2).

3.4. Relationship between self-reported empathy and Mentalizing performance

Performance on the Mentalizing task was unavailable for one patient. The between group comparison for Mentalizing performance revealed no significant between group difference (Mann–Whitney $U = 389.5$, $Z = -1.13$, $p = 0.258$). When considering all participants, a significant correlation was only observed between Mentalizing performance and the Emphatic concern scale ($r = 0.28$, $p = 0.029$). Considering the two groups separately, a significant correlation was observed in the FEP group ($r = 0.46$, $p = 0.011$), but not in the control

Table 2
Effect sizes from the six studies that assessed cognitive and affective empathy with the IRI in patients with schizophrenia (SZ) versus healthy controls (CO), as well as in our study in first-episode psychosis.

Paper	n SZ	n CO	Illness duration (years)	Perspective taking (ES d)	Fantasy (ES d)	Empathic concern (ES d)	Personal distress (ES d)
Previous studies in SZ							
Haker and Rossler (2009)	43	45	11.0	0.57	0.42	0.23	−0.65
Derntl et al. (2009)	24	24	11.5	0.28	0.79	0.23	−0.76
Fujiwara et al. (2008)	24	20	10.4	0.66	0.98	0.19	−0.72
Montag et al. (2007)	45	45	11.6	0.63	0.10	−0.17	−1.05
Shamay-Tsoory et al. (2007b)	26	31	NR	1.06	0.51	0.52	−0.33
Shamay-Tsoory et al. (2007a)	22	55	NR	0.89	0.44	0.52	−0.41
Pooled ES d in SZ				0.66	0.45	0.21	−0.68
Our study in FEP							
ES d in FEP				0.19	0.08	0.06	−0.48
Comparison FEP vs. SZ							
χ^2				2.74	1.70	0.29	0.38
p-value (one-tailed)				0.048	0.096	0.294	0.270

FEP = first-episode psychosis.
SZ = schizophrenia.
ES d = effect size d (a positive ES d indicates a greater score in controls whereas a negative ES d indicates a greater score in patients).
NR = not reported.

group ($r = 0.14$, $p = 0.448$), perhaps because of the restricted range of scores on the Mentalizing task in the control group.

3.5. Effect of IQ on the pattern of results

Including IQ as a covariate did not change the pattern of results for between group analyses on the four IRI scales, or the pattern of correlation between the IRI scales and symptoms in the FEP group.

For the Mentalizing task, which was initially analyzed using non-parametric tests due to non-normality of the distributions, using exploratory parametric analyses to include IQ as a covariate did not seem to change the pattern of between group difference (i.e. the between group difference remained non-significant), but the correlation with the Empathic concern scale was no longer significant ($p = 0.25$), suggesting that general cognitive abilities might have contributed to the relationship between Mentalizing performance and Empathic concern rating.

4. Discussion

4.1. Comparisons with healthy controls

In line with our hypothesis, we observed a significant difference relative to previous schizophrenia studies for the Perspective taking scale. This observation is consistent with a previous report of a significant correlation between Perspective taking and duration of psychosis (Montag et al., 2007). Given that Fantasy ratings were also less affected in our FEP group, even if the comparison with previous studies did not quite reach significance (with a $p = 0.096$), the pattern of cognitive empathy ratings is compatible with the idea of a deterioration of the cognitive component of empathy with increased duration of illness. A follow-up would, however, be required to provide more direct and longitudinal evidence of this deterioration, especially given that it could be that patients with better cognitive empathy abilities have better outcomes and are thus less likely to be recruited in studies targeting more chronic patients.

In addition, we observed a trend for increased reports of Personal distress in our FEP patients relative to controls, with an effect size in the range as that reported in cohorts of patients with a longer history of schizophrenia. Although these results would deserve replication with sample size that would allow reaching statistical significance, the observed moderate effect size suggests that patients with a schizophrenia spectrum psychosis likely show increases in self-oriented affective empathy ratings (as measured with the Personal distress

scale) that can be detected from the onset of psychosis (Montag et al., 2007; Shamay-Tsoory et al., 2007a,b; Bora et al., 2008; Fujiwara et al., 2008; Derntl et al., 2009; Haker and Rossler, 2009) . Since the Personal distress component of affective empathy seems more affected than Empathic concern when considering the effect sizes from this as well as previous studies relying on the IRI, the pattern of results suggests that people with schizophrenia have a specific deficit of emotion regulation mechanisms, rather than a general affective empathy deficit. This idea is also consistent with the observation of a strong trend for a correlation between Personal distress ratings and levels of social anxiety symptoms in our patients.

4.2. Correlations with symptoms

Contrary to our expectations, we observed no significant correlation between empathy ratings of our cohorts and the positive, negative or the general psychopathology scale from the PANSS. Such correlations had been previously observed for the PANSS negative subscale (Shamay-Tsoory et al., 2007a,b), although the empathy measures used in these studies were global indices of empathy instead of ratings for specific components of empathy. Because the PANSS mean scores were not reported in these two previous studies, it is also possible that the difference in the level of symptoms could account for the difference in the results between these studies and ours. In this study, patients presented with relatively low levels of negative symptoms (PANSS negative mean = 16.0), a factor that could account for the lack of an association with empathy ratings.

In contrast, patients presented with important levels of social anxiety symptoms, and we observed significant correlations between LSAS ratings and Perspective taking ratings, such that patients who showed higher levels of social anxiety reported a lesser tendency to adopt other people's perspective. Social anxiety is recognized to contribute to lower social adjustment and lower quality of life in patients with schizophrenia (Pallanti et al., 2004). Our results thus suggest that improving or preventing deterioration of Perspective taking abilities in patients with FEP could be one way to decrease social anxiety and improve social functioning in these patients. Similarly, improving social anxiety could have positive effects on Perspective taking abilities, and it would be very interesting to compare the effect of therapeutic approaches centered primarily on social anxiety or centered primarily on Perspective taking abilities for improving social anxiety symptoms, Perspective taking abilities and functional outcome.

As previously mentioned, a trend for a positive relationship with Personal distress ratings was also observed in this study, such that patients with higher levels of social anxiety reported experiencing more Personal distress in intense interpersonal conflicts. It is thus possible that impairments in the emotion regulation mechanism, a key component of the empathy model proposed by Decety and Jackson (2006, Decety et al., 2007), could have contributed to the significant increase in Personal distress ratings in FEP relative to our control group, as well as to the important levels of social anxiety displayed by our FEP patients. The effect of therapies targeting emotion regulation abilities should thus also be considered in future studies.

4.3. Relationship with Mentalizing performance

No significant difference was observed between the groups on the Mentalizing task, but a significant association emerged with the Empathic concern scale from the IRI, which was particularly evident in the FEP group. This significant association could reflect that Mentalizing is necessary in order to identify that others are going through undesired or disagreeable events and feel empathy towards their situation. However, an alternative explanation could be that indifference to what other people are going through could lead to difficulties in Mentalizing. The fact that we did not observe such a relationship in our control group could reflect the lack of sensitivity of the Mentalizing task for young control subjects, as most controls showed very high performance on the test, with about two-thirds of the participants making only one or no errors. The relationship between intention attributions and the IRI Empathic concern scale would definitely deserve to be replicated with more sensitive Mentalizing tests and with a larger group of patients.

The lack of a significant association with Perspective taking is also intriguing. In future studies, it would be interesting to include a Mentalizing test that measures the capacity to infer a person's mental state (e.g. knowledge, beliefs, intentions, desires, and emotions) in cases where this mental state differs from that of the participant, which would increase the need for Perspective taking. This could be achieved for example by presenting a character that seems to like something that most people would not like, a character that is afraid of something most people would not be afraid of, or a character who is acting on a different set of information than those available to the participant. False belief Mentalizing tasks would fit this profile, though false belief tasks used in most previous studies included very few items and might thus not be very sensitive to detect a relationship with Perspective taking ratings.

4.4. Limitations

A first limitation is that our sample included too few female subjects to assess effects of gender on empathy ratings. Although we matched our groups in terms of the number of female subjects, it is not excluded that a gender by group interaction could come to influence the pattern of the results. As far as we are aware, such interaction has not been tested in previous schizophrenia studies. A second limitation relates to the medicated status of the patients. Though we believe that testing patients that are relatively stabilized improves their ability to follow task instructions, it remains that some of the observed effects could be related to medication effects, rather than to the illness proper. Second-generation antipsychotics such as those used by the patients in our FEP group have however been reported to improve, rather than impair, cognitive processing in psychotic patients (Keefe et al., 2007), though the extent of this improvement is small and controversial (Harvey and Keefe, 2001). The fact that we used a broad definition of first-episode psychosis, including patient with up to 57 months since initial treatment, could also be considered as a limitation of this study. Though it is not

uncommon to include patients up to 5 years following their initial treatment in first-episode psychosis studies, this broad range of illness duration could have potentially impacted our results. However, we observed no relationship between treatment duration and the IRI ratings in our patient group.

Another limitation is that comorbid disorders that are highly prevalent in psychotic patients were not taken into account in our study. Patients presenting with a psychosis are known to show increased prevalence for a range of comorbid disorders (e.g. Achim et al., in press), some of which could potentially influence empathy ratings and Mentalizing performance. Here, only social anxiety symptoms were considered and a relationship with empathy ratings was indeed observed.

The Mentalizing task included in the current study (Sarfati et al., 2003) also presents with several limitations. These include the lack of sensitivity and ceiling effects, which were most predominant in the control group but also observed to a lesser extent in the FEP group. Moreover, this task corresponds to a first-order Mentalizing task, since only one character is involved in most of the cartoon stories. Previous studies that reported Mentalizing deficits in FEP have rather relied on second-order Mentalizing tasks such as a second-order false belief question (Inoue et al., 2006) or the hinting task (Bertrand et al., 2007). Moreover, in Inoue et al.'s study, the second-order Mentalizing deficit was not accompanied by a significant deficit on the first-order false belief question, consistent with the idea that first-order Mentalizing tasks are less likely to reveal deficits in these patients. The Mentalizing task used in our study also involved assessment of only one main type of mental state, namely intentions, and it is possible that the assessment of different types of mental states (e.g. beliefs, knowledge or emotions) could be linked to different aspects of empathy. Most importantly, future studies should include mental state assessments for situations that vary in terms of the level of Perspective taking required, to provide a more targeted objective measure of that aspect of empathy.

4.5. Conclusion

Overall, these findings are consistent with the idea that cognitive empathy deteriorates with the progression of psychosis. Our results also suggest that at least some FEP patients present with elevated levels of Personal distress. Assessing these difficulties early with tools such as the IRI could lead to more targeted treatments, including preventive approaches that would help maintain the tendency to try to take the perspective of others. In addition, treatment targeting the affective regulation mechanisms, perhaps through cognitive behavior therapy (Gaudiano, 2005), could help to control personal distress and social anxiety symptoms. Some remediation treatments have already proven successful at improving related social skills in people with schizophrenia (Combs et al., 2007; Horan et al., 2009; Roberts and Penn, 2009) and efforts to implement similar approaches for empathy early on in the progression of the illness should lead to encouraging results.

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