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Affect recognition in people at clinical high risk of psychosis

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ABSTRACT

Individuals with schizophrenia demonstrate stable deficits in affect recognition. Similar deficits in affect recognition have been observed in those who are at clinical high risk (CHR) of developing psychosis. The current project aimed to longitudinally examine affect processing in CHR individuals, to determine if affect processing predicted later conversion to psychosis and if affect processing deficits were unique to those who met established criteria for prodromal syndromes. The sample consisted of 172 CHR and 100 help-seeking individuals (HS) who were followed for up to 24 months. All CHR individuals met the Criteria of Prodromal Syndromes (COPS) based on the Structured Interview for Prodromal Symptoms (SIPS). The SIPS was used to determine conversion to psychosis. Affect recognition was assessed using two facial affect recognition tasks and a measure of affective prosody. In comparison to previously published data from non-psychiatric controls, both CHR and HS groups demonstrated deficits in affect recognition. By 2 years 25 CHR participants converted to psychosis. Interestingly, there were no differences between converters and non-converters on any affect recognition tasks. This is one of the first studies to longitudinally examine affect processing and its relationship to later conversion to psychosis in individuals at-risk for psychosis. While poorer affect recognition may be associated with vulnerability for psychosis, the current results suggest that it may not be a marker of developing a psychotic illness.

1. Introduction

There is a growing interest in social cognition in schizophrenia, mainly due to its association with poor social functioning (Fett et al., 2011). One of the most studied domains of social cognition is affect recognition. It has been well established that individuals with schizophrenia demonstrate stable deficits in both discrimination and identification of affect irrespective of modality, facial (Addington et al., 2006; Pinkham et al., 2007; Horan et al., in press) or prosodic (Edwards et al., 2001; Kucharska-Pietura et al., 2005), and across all stages of illness (Green et al., in press). Similar deficits in affect recognition have been observed in individuals who are putatively prodromal for psychosis, i.e., at clinical high risk (CHR) of developing a psychotic disorder. CHR individuals, relative to healthy controls, have demonstrated impaired performance on facial affect identification comparable to the performance of individuals with a first episode of psychosis and those who have a more chronic course of psychosis (Addington et al., 2008; Green et al., in press). Amminger et al. (in press), using both a facial affect task as well as a measure of affective prosody, reported similar results relative to healthy controls and first episode patients; CHR individuals exhibited deficits in the recognition of fear and sadness across both face and voice modalities compared to non-psychiatric controls.

Although these studies suggest that affect recognition deficits may be a trait-characteristic, there are no longitudinal studies testing the stability of affect recognition in those at clinical high risk or examining its relationship to conversion to psychosis. The aim of this project was to examine longitudinally affect processing in a large sample of individuals at CHR of psychosis, to determine if affect processing was a predictor of later conversion to psychosis and to determine if deficits in affect processing were unique to those who met established criteria for a prodromal syndrome.

2. Method

2.1. Sample

The overall sample consisted of 172 individuals (98 males, 74 females) at CHR of psychosis with a mean age of 19.8 (SD = 4.5) years and 100 help-seeking individuals, the help-seeking controls (HSC) (56 males, 44 females) with a mean age of 19.4 (SD = 3.9) years. All were participants in the PREDICT study that was conducted at the Universities of Toronto (70 CHR, 45 HSC), North Carolina (62 CHR, 31 HSC) and Yale (40 CHR,

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24 HSC). PREDICT was designed to determine predictors of conversion to psychosis. All CHR individuals met the Criteria of Prodromal Syndromes (COPS) based on the Structured Interview for Prodromal Symptoms (SIPS) (McGlashan et al., 2010). Participants were excluded if they were using antipsychotics at baseline. Furthermore, antipsychotics were not used at any later points in this study. One hundred and sixty-eight CHR participants met attenuated positive symptom syndrome (APSS) criteria, which include the emergence or worsening of a non-psychotic level disturbance in thought content, thought process or perceptual abnormality over the past year. Four participants met criteria for genetic risk and deterioration (GRD), which required either a first degree relative with a psychotic disorder or the subject having schizotypal personality disorder (SPD) plus at least a 30% drop in functioning on the General Assessment of Functioning (GAF) scale in the past 12 months. The HSC group were individuals who had (i) responded to recruitment efforts for the CHR sample, and (ii) on a phone screen appeared likely to meet prodromal criteria but after the initial comprehensive interview did not. The HSC group consisted of the following groups: (i) family high risk but no decline in functioning ($n=17$), (ii) long standing symptoms i.e. attenuated positive symptoms had been present for more than one year ($n=47$), current prodromal symptoms but symptoms were clearly due to another disorder ($n=2$), (iii) only had negative symptoms ($n=4$) and (iv) the remaining group reported vague symptoms that neither met severity nor frequency ($n=30$). Those with longstanding symptoms were individuals who had attenuated psychotic symptoms that had begun or worsened more than a year before and were rated 3–5 on severity on the Scale of Prodromal Symptoms (SOPS). This severity is within the prodromal range, but to meet prodromal criteria attenuated symptoms have to have begun or worsened in the past year.

The Structured Clinical Interview for DSM-IV (SCID-I) (First et al., 1995) was used to determine the presence of any axis I disorders. Participants were excluded if they met criteria for any current or lifetime axis I psychotic disorder, prior history of treatment with an antipsychotic, or past or current history of a clinically significant central nervous system disorder which may confound or contribute to clinical high risk symptoms. A comprehensive clinical assessment was conducted by the PI or clinical psychiatrist or psychologist at each site to determine if entry criteria were met. Only 146 of the CHR participants and 85 of the HSC completed the affect recognition tasks. In addition, since this longitudinal study lasted for four years, the first person recruited could have had four years of follow-up whereas the last person may have only had 3 months. Therefore at each follow-up, missing subjects are accounted for either by conversion to psychosis, missing the assessment, dropping out of the study or not being in the study long enough to reach that particular follow-up. See Table 1.

2.2. Measures

Criteria for a prodromal syndrome and criteria for conversion to psychosis were determined using the Structured Interview for Prodromal Syndromes (SIPS) (McGlashan et al., 2010). Conversion meant that at least one of the five attenuated positive symptoms reached a psychotic level of intensity (rated 6) for a frequency of ≥1 h/day for 4 days/week during the past month or that symptoms seriously impacted functioning (e.g. severely disorganized or dangerous to self or others) (McGlashan et al., 2010). Symptoms were assessed with the Scale of Prodromal Symptoms (SOPS), which consists of 19 items in 4 symptom domains: positive, negative, general and disorganized. Intelligence was assessed using the Block design, Arithmetic, Digit Symbol/Coding, Vocabulary and Information subtests from the Wechsler Adult Intelligence Test (WAIS)/Wechsler Intelligence Scale for Children-III (WISC-III) (Blyler et al., 2000).

Facial affect recognition was assessed with the Facial Emotion Identification Test (FEIT) and the Facial Emotion Discrimination Test (FEDT) (Kerr and Neale, 1993). These measures have been described in detail elsewhere (Addington et al., 2008). Affective prosody (AP) was assessed using a task developed by Edwards and colleagues (Edwards et al., 2001) and used in the Amminger study (Amminger et al., in press). The task involves audio recordings of 4 simple sentences (i.e. "he will come soon", "they must stay here", "she will drive fast" and "we must go there") spoken by three professional actors displaying following emotions: fear, sadness, anger, surprise and neutral resulting in a total of 60 items. Based on sentence recordings participants were required to indicate which emotion was expressed. For each actor, there were 3 practice and 20 target items, with eight seconds of silence between each item. Published reliability coefficients (Chronbach's alpha) for AP is 0.85 (Edwards et al., 2001), for FEDT is 0.68, (Pinkham and Penn, 2006) and FEIT is 0.50 (Pinkham and Penn, 2006).

2.3. Procedures

This was a longitudinal study of predictors of conversion to psychosis whereby all three sites recruited CHR and HS individuals. Raters were experienced research clinicians who demonstrated adequate reliability at routine reliability checks. Gold standard post-training agreement on the distinction between high risk and psychotic levels of intensity on the positive symptom items (i.e., the critical threshold for determining initial eligibility and subsequent conversion status) was excellent (kappa = 0.90). The DSM-IV diagnoses were made using the SCID-I. Interrater reliability was determined at the start of the study and annually by 100% agreement on the diagnosis and at least 80% agreement for symptom presence. JA chaired weekly conference calls to review criteria for all individuals admitted to the study. Affect processing assessments were conducted by trained research assistants trained by DLP. The study protocols and informed consents were reviewed and approved by the ethical review boards of all three study sites.

2.4. Statistical analyses

All analyses were performed with the use of IBM SPSS version 19 and SAS version 9.2. The Student *t*-test and chi-square test were used to compare baseline differences between the CHR group and the HS group and between the converters and the non-converters. Mann–Whitney *U* test was used to compare converters and non-converters given the unequal sample sizes in the two groups. Spearman correlations were used to determine associations amongst measures. To accommodate missing data and account for intra-participant correlation over time, generalized linear mixed model for repeated measures was used to examine changes over time (baseline, 6 months, 12 months, 18 months and 24 months) and group differences for ratings on the three affect recognition measures.

Table 1
Reasons for missing data.

	Clinical-high risk assessment (years)				Help-seeking controls assessment (years)			
	0.5	1	1.5	2	0.5	1	1.5	2
Completed	79	50	35	25	48	46	32	24
Missed because study ended	3	24	45	67	0	8	15	26
No show	52	55	43	28	36	29	35	32
Converted	12	17	23	26	1	2	3	3
Total	146	146	146	146	85	85	85	85

3. Results

3.1. Sample characteristics

There were no demographic differences between the CHR and HSC groups. Within the CHR group there were no differences between those who converted and those who did not convert within the time of the study. These results are presented in Table 2. The CHR group had significantly higher ratings on attenuated positive symptoms and on