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The association between social anhedonia, withdrawal and psychotic experiences in general and high-risk populations

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ABSTRACT

Background: Social anhedonia (SA) and withdrawal are clinically relevant phenomena in schizophrenia. To examine the nature of the overlap between SA, withdrawal and positive symptoms, we investigated whether the co-occurrence of these phenotypes is more prominent in siblings of patients with a psychotic disorder compared to healthy controls, and if this association is independent of the amount of distress caused by psychotic experiences (PEs).
Method: Data were derived from 646 unaffected siblings and 326 healthy controls who were included in the Dutch Genetic Risk and Outcome in Psychosis (GROUP) study. PEs were assessed with the Community Assessment of Psychic Experiences and the Structured Interview for Schizotypy-Revised was used to examine social anhedonia and withdrawal.
Results: Our results show relatively small but significant cross-sectional associations between SA, withdrawal and PEs in unaffected siblings and none in the control group, irrespective of the level of distress caused by PEs.
Conclusions: The findings of the present study suggest that the overlap between SA, withdrawal and psychotic symptoms often reported in schizophrenia patients, may at least partly reflect a shared genetic vulnerability, instead of merely being either a state marker of – or reaction to – acute psychotic symptoms.
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1. Introduction

Social anhedonia (SA) is a clinically relevant phenomenon in schizophrenia. It is related to social withdrawal and refers to a decreased ability to experience gratification from social interactions. SA is also thought to be a potential indicator of vulnerability to schizophrenia-like disorders (Kendler et al., 1996; Horan et al., 2007), as it was found to be increased in patients' unaffected siblings (Katsanis et al., 1990; Kendler et al., 1996; Laurent et al., 2000).

Social disinterest has long been recognized as a central feature of psychosis vulnerability (Kraepelin and Gosline, 1919; Bleuler, 1950/1911; Rado, 1953; Meehl, 1962). Both Kraepelin and Bleuler described 'Asociality' to be a prominent premorbid feature in schizophrenia (Kraepelin and Gosline, 1919; Bleuler, 1950/1911). According to Rado (1953) (in Kayton and Koh, 1975), a loss of the experience of pleasure could be explained by a biologically based hedonic deficit, a deficit he termed 'anhedonia' (Kayton and Koh, 1975; Kwapil, 1998; Juckel et al., 2003). Meehl (1962) elaborated on this idea and advocated that a lack of interpersonal pleasure could lead to social withdrawal, inappropriate behavior and even to delusional ideas (Chapman et al., 1976). Chapman et al. (1976) subsequently introduced a distinction in the anhedonia-concept between physical gratifications (such as the pleasure of eating, touching and smell) and social anhedonia (referring to the pleasure of being with/communicating with other people). It was Andreassen (1982) who 're-emphasized' the concept of SA as part of the negative symptom cluster (Juckel et al., 2003).

More recently, SA research extended to non-clinical samples with the aim to determine whether higher levels of SA could identify people who are at risk for a disorder in the schizophrenia spectrum (e.g. Collins et al., 2005). In this cross-sectional type of study, the frequency of subclinical attenuated positive symptoms in young adults rating high vs low on SA was compared. It was consistently found that the SA group exceeds the control group in the reported number of psychotic experiences (PEs) (Kwapil, 1998; Collins et al., 2005; Rey et al., 2009; Blanchard et al., 2011).

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Moreover, growing literature on the course of young people thought to be at Ultra High Risk (UHR) for developing a first psychotic episode suggests that SA contributes to the prediction of psychosis in this group (Riecher-Rössler et al., 2009; Velthorst et al., 2009). In fact, although the current UHR criteria are primarily based on the presence of attenuated positive symptoms (i.e. subclinical hallucinations, delusions and disorganization), various research groups have advocated that subclinical psychotic experiences are more likely to predict transition to psychosis when accompanied by SA and withdrawal (Velthorst et al., 2009; Ruhrmann et al., 2010). It has been hypothesized that PEs alone are insufficient for psychosis prediction, as they may represent age-related transitory experiences that appear rather frequent in early adulthood (Verdoux and van Os, 2002; Yung et al., 2006).

SA and withdrawal may contribute to the development of psychosis by reducing the possibility of reality testing in social interaction. If thoughts are not being tested in social interaction, social withdrawal might reinforce the development and maintenance of delusional ideas and suspiciousness (Velthorst et al., 2009), causing a person to eventually trespass the psychosis threshold. However, the association between PEs and SA and social withdrawal could also be explained in reverse. Withdrawal from social interaction in help seeking UHR populations may not merely be a causal or moderating factor in the development of psychotic symptoms, but could also be explained as a consequence of distress in response to the illness.

In an effort to distinguish between the abovementioned hypotheses, in the present paper we will evaluate whether the relationship between SA/withdrawal and PEs is more prominent in siblings of patients with a psychotic disorder compared to healthy controls independent of the amount of distress caused by the PEs. We will investigate this relationship in a representative group of healthy index and control subjects and expect a more prominent association between SA and PE in the sibling group, who are thought to be at risk but who are not (yet) ill. A more prominent relationship in this group could indicate that the co-occurrence of both symptom clusters marks vulnerability for subsequent psychosis development. We further sought to explore the association between SA and withdrawal and signs of disorganization, as this may provide further insight in the role of SA and withdrawal in the development of schizophrenia.

2. Methods

2.1. Study sample

Baseline data was collected from a subsample of 1057 siblings and 590 healthy controls, recruited as part of an ongoing multi-centered longitudinal study (Genetic Risk and Outcome in Psychosis [GROUP]) in the Netherlands and Belgium (for an elaborate description of the study protocol, see Korver et al., in press). Controls were selected through a system of random mailings to addresses in a selected representative geographical area of the patients also participating in GROUP. Siblings of schizophrenia patients and healthy controls were eligible for the study if they were (1) aged between 16 and 50 years, and (2) had good command of the Dutch language. Exclusion criteria for healthy controls were a history of psychotic disorder or a first-degree family member with a history of psychotic disorder.

The study protocol was approved centrally by the Ethical Review Board of the University Medical Centre Utrecht and subsequently by local review boards of each participating institute. All subjects gave written informed consent in accordance with the committee's guidelines.

2.2. Instruments

2.2.1. Psychotic experiences

2.2.1.1. Hallucinations and delusions. To assess the presence of hallucinatory and delusional experiences, all participants completed the Community Assessment of Psychic Experiences (CAPE; www.cape42.homestead.com; Stefanis et al., 2002; Konings et al., 2006). The CAPE is a self-report questionnaire that assesses the frequency of lifetime psychotic experiences (PEs) as well as the amount of distress caused by these PEs. Frequency and distress are both rated on a four-point scale, ranging from 'never' (1) to 'nearly always' (4) (frequency), and from 'not distressed' (1) to very distressed (4) with regard to distress. The CAPE frequency items (n = 42) can be subsumed under a three factor-structure constituting of a positive, negative and depression symptom dimension (Stefanis et al., 2002; Verdoux et al., 2003). Research has shown that this questionnaire has good discriminative validity, family-specific variation and stability over time (Hanssen et al., 2003, 2006; Konings et al., 2006; see also Korver et al., in press).

For the current analyses, the frequency and distress ratings of the positive symptom dimension were used. The positive symptoms were further separated according to a validated factor structure of the CAPE (Brenner et al., 2007), and encompassed the following factors: Social Delusions (SocDel; e.g. being persecuted, n = 6), Bizarre Experiences (Biz; e.g. messages from TV, n = 11) and Popular Beliefs (PopB; Telepathy, Voodoo n = 2).

2.2.1.2. Disorganization. Signs of disorganization were assessed with the Structured Interview for Schizotypy — Revised (SIS-R; Kendler et al., 1989; Vollema and Ormel, 2000). The SIS-R consists of 20 schizotypal symptoms and 11 schizotypal signs which are derived from observations during the interview. Items are scored on a four-point scale ranging from absent (score 0) to severe (score 3). The instrument is divided in a Positive, a Negative and a Disorganization Schizotypy scale. Positive schizotypy covers the following symptoms: referential thinking, magical ideation, illusions and suspiciousness (six items in total). Negative schizotypy contains the symptoms social isolation, social anxiety, introversion, restricted affect, referential thinking, and suspiciousness (8 items in total). In the present analyses, we focused on the third cluster, 'Disorganization Schizotypy', a cluster encompassing the following signs: goal directedness of thinking, loosening of associations, and oddness (3 items).

2.2.2. Social anhedonia and withdrawal

Data on SA and withdrawal was also derived from the SIS-R (SIS-R; Kendler et al., 1989; Vollema and Ormel, 2000). To measure SA and withdrawal, we focused on the negative schizotypy symptoms 'social isolation' and 'introversion'. Social isolation concerns the amount of social activities in which someone is engaged, and encompasses items such as "How often do you have contact with your friends?" and "How close do you feel to your friends?". The SIS-R item introversion refers to the degree to which a person turns inward or is inwardly directed. The introvert in this case is not needy for social attention (SIS-R; Kendler et al., 1989; Vollema and Ormel, 2000). Anchor points of this item fit the anchorpoints of the 'social anhedonia and withdrawal' criterion from the Structured Interview for Prodromal Symptoms, a structured interview designed to assess and diagnose the severity of prodromal symptoms of schizophrenia and other psychotic disorders (Miller et al., 2003). For the current analyses, social isolation and introversion were dichotomized using the median of our sample.

2.2.3. IQ-estimate

To estimate IQ, the following four subtests of the Wechsler adult intelligence scale (WAIS III; Wechsler, 1997) were employed: Arithmetic, Digit Symbol-coding, Reasoning/problem solving and Block Design (Blyler et al., 2000).

2.3. Statistical analysis

Statistical analyses were performed with SPSS (version 18.0) for Windows. Differences in baseline characteristics were examined

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