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Associations between the Five-Factor Model personality traits and psychotic experiences in patients with psychotic disorders, their siblings and controls

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ABSTRACT

Earlier studies indicated that personality characteristics contribute to symptomatic outcome in patients with psychotic disorders. The aim of the present study was to further explore this connection by examining the relationship between the Five-Factor Model (FFM) personality traits and a dimensional liability for psychosis. FFM traits according to the NEO-FFI and levels of subclinical psychotic symptoms according to the CAPE were assessed in 217 patients with psychotic disorders, 281 of their siblings and 176 healthy controls. Psychotic symptoms according to the PANSS were assessed in the patient group. Patients differed from siblings and controls on four of the five FFM traits, all but Openness. Siblings reported higher levels of Neuroticism than controls, but lower levels than patients. Particularly lower Agreeableness, and to a lesser degree, higher Neuroticism and lower Extraversion were associated with more severe symptoms in patients. Furthermore, higher Neuroticism and higher Openness were associated with higher levels of subclinical psychotic experiences in all three groups. Associations were strongest in patients. Our findings suggest that levels of Neuroticism increase with the level of familial risk for psychosis. Levels of Openness may reflect levels of impairment that distinguish clinical from subclinical symptomatology.

1. Introduction

Recent reviews of literature concerning normal personality traits and schizophrenia suggest that the relationships between the Five-Factor Model (FFM) personality traits (Digman, 1990; McCrae, 1992) and clinical phenomena in patients with schizophrenia and related disorders are more complex and reciprocal than previously conceptualized (Andersen and Bienvenu, 2011; Dinzeo and Docherty, 2007). The five personality traits of the FFM are Neuroticism: the vulnerability to emotional instability and self-consciousness, Extraversion: the tendency to be warm and outgoing, Openness: the cognitive disposition to creativity and esthetics, Agreeableness: the tendency to be sympathetic, trusting and altruistic and Conscientiousness: the tendency towards dutifulness and competence. These five traits are believed to represent the most basic dimensions of personality (Costa and McCrae, 1992).

There are several reasons why the study of FFM personality traits is relevant to schizophrenia research. First, FFM traits may contribute to the vulnerability to develop the disorder. Premorbid high levels of Neuroticism, and other traits that reflect a vulnerability to worry and be distressed, were found to be a risk factor for the development of schizophrenia (Goodwin et al., 2003; Krabbendam et al., 2002; Lonnqvist et al., 2009; van Os and Jones, 2001), while a high level of Extraversion reduces the risk (van Os and Jones, 2001). The former finding is consistent with the vulnerabily-stress model of schizophrenia. This model states that dispositional vulnerability factors are associated with high sensitivity to environmental stressors that increases an individual's liability for the onset or exacerbation of psychotic symptoms (Nuechterlein et al., 1994). The latter finding (elements that reduce

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the risk) might be explained by the 'stress buffering' hypothesis, which states that social support makes people less vulnerable to stress (Cohen and Wills, 1985). After onset of illness, patients with schizophrenia and related disorders continue to present higher levels of Neuroticism and lower levels of Extraversion than healthy controls (Berenbaum and Fujita, 1994; Herran et al., 2006; Kentros et al., 1997; Reno, 2004), regardless of fluctuations in positive symptoms (Kentros et al., 1997). Additionally, some studies reported lower levels of Conscientiousness in patients with schizophrenia (Gurrera et al., 2000; Kentros et al., 1997), whereas others found differences in all five FFM personality traits (Beauchamp et al., 2006; Camisa et al., 2005).

The second reason of interest is that FFM personality traits may influence the course of illness. Earlier studies found low levels of Extraversion (Jonsson and Nyman, 1991) and both high levels of Neuroticism and low levels of Agreeableness (Gleeson et al., 2005) to be associated with a higher risk of psychotic relapse in patients with schizophrenia and related disorders.

The third reason is that there is some evidence that FFM personality traits are associated with specific symptoms, although findings are inconsistent. One study reported associations between positive symptoms and both Neuroticism and Agreeableness (Lysaker et al., 2003). Neuroticism has also been associated with emotional distress-related symptoms (Huber et al., 2012). Negative symptoms were found to be inversely associated with Extraversion (Kentros et al., 1997; Herran et al., 2006); one study also found inverse associations with Openness and Agreeableness (Kentros et al., 1997). In a prospective study of psychotic symptoms in patients with schizophrenia, high levels of Neuroticism and low levels of Extraversion were found to be associated with more emotional disstress at one year follow-up; and low levels of Agreeableness were associated with more positive symptoms one year later (Lysaker and Taylor, 2007). However, other studies found no associations between FFM personality traits and symptoms of psychosis (Beauchamp et al., 2011; Gurrera et al., 2000).

To date, little is known about possible differences in normal personality traits between individuals with an increased familial risk for psychosis (first-degree relatives of patients with psychotic disorders) compared to healthy control subjects. One study found that first-degree relatives reported higher levels of Neuroticism compared to healthy controls (Maier et al., 1994); however these findings were not replicated in another study (Laurent et al., 2003).

To our knowledge, there have been no prior studies that explore associations between subclinical psychotic symptoms and FFM personality traits in patients with psychotic disorders, their first-degree relatives as well as healthy control subjects. By including first-degree relatives of patients with psychotic disorders and by expanding the focus to subclinical psychotic symptoms, more can be learned about potential associations between personality traits and a dimensional liability for psychosis. Findings could contribute to a better understanding of how personality and symptomatic outcome in patients with psychotic disorders might be related.

Subsequently, the research questions in the current study are: (1) do patients and their siblings report different levels of FFM traits compared to healthy control subjects? (2) Which FFM traits best predict current psychotic symptoms in patients with psychotic disorders? (3) Are FFM traits associated with subclinical psychotic symptoms in patients, siblings and controls? (4) If so, are these associations different for the three groups?

2. Methods

2.1. Participants and procedures

GROUP (Genetic Risk and Outcome of Psychosis) is an ongoing Dutch longitudinal multicenter cohort study that was designed to study vulnerability and resilience factors for variation in expression and course of non-affective psychotic disorders. Details of the GROUP study have been described elsewhere (Korver et al., 2012). A subsample of the patients, siblings and healthy control subjects participated in the current study on personality traits (Amsterdam and Utrecht regions). Data from the second measurement (database 3.2, data collected between 2008 and 2011) was used for analyses. Eligible patients fulfilled the following criteria: (1) age between 18 and 50 (extremes included), (2) meeting DSM-IV criteria (American Psychiatric Association, 2000) for a non-affective psychotic disorder; schizophrenia, schizophreniform disorder, schizoaffective disorder, delusional disorder or psychotic disorder NOS, (3) maximum duration of illness of 10 years, (4) fluent in Dutch, (5) participating in NEO-FFI assessment. Siblings were between 18 and 50 years of age and had no life time diagnosis of psychosis. Healthy control subjects were between 18 and 50 years of age and had no lifetime diagnosis of psychosis and no first-degree family member with a life time diagnosis of psychosis.

2.2. Instruments

DSM diagnoses were based on the Comprehensive Assessment of Symptoms and History (CASH) (Andreasen et al., 1992). The CASH is a widely-used semi-structured interview designed for research of the major psychoses.

The Community Assessment of Psychic Experiences (CAPE; www.cape42.homestead.com) was used to rate self-reports of psychotic experiences in the preceding three years. The CAPE measures frequency as well as distress associated with subclinical positive, negative and depressive symptoms. In the present study we included frequency of subclinical positive and negative symptoms to analyses. We recoded the original 1–4 scale into a scale of 0–3 (zero indicating that psychotic experiences were absent). Studies using the CAPE in general population samples have shown good psychometric properties in terms of reliability and validity (Hanssen et al., 2006; Konings et al., 2006).

Current psychotic symptoms in patients with psychotic disorders were assessed with the Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987). The PANSS is a widely used interview to assess the symptoms of schizophrenia. The five factor model by Van der van der Gaag et al., 2006a was used for analyses. This model has good validity compared to earlier models (van der Gaag et al., 2006b). (Incidentally, the similar name of the Five-Factor Model of personality is coincidental).

The Dutch version of the NEO-FFI (Costa and McCrae, 1992; Hoekstra et al., 1996) was used to rate self-reports of the FFM personality traits. The NEO-FFI has demonstrated satisfactory to excellent construct validity and moderate to good internal reliability in general population samples, with slightly lower Chronbach alpha's for Openness and Agreeableness (Costa and McCrae, 1992; Hoekstra et al., 1996). Scores of patients with schizophrenia and related disorder were found to be comparable to clinician's estimation on most FFM traits, although patients with poor insight seem to overestimate their level of Extraversion (Bell et al., 2007).

2.3. Data analyses

SPSS 18 was used for all analyses. Cases were excluded if they missed ≥30% of the NEO-FFI ($N=5$). Also, some patients were excluded because diagnoses did not fulfill criteria for a non-affective psychotic disorder ($N=7$). Normality of the NEO-FFI, CAPE and PANSS scales was checked visually (histograms and boxplots) and confirmed by Shapiro–Wilk tests. Possible differences in gender and age between patients, siblings and controls were assessed with Chi-square tests and one-way analysis of variance (ANOVA). A one-way between groups multivariate analysis of variance (MANOVA) was performed to investigate differences in levels of FFM traits between patients, siblings and controls. Tukey HSD posthoc comparisons were performed to determine pair wise group differences.

Standard regression analyses were performed to investigate whether FFM traits predicted the levels of psychotic symptoms in patients. Then similar regression analyses were conducted to investigate whether the FFM traits predicted the levels of subclinical psychotic experiences in all three groups separately. Subsequently, in order to examine the group differences in relations between FFM traits and subclinical positive symptoms while taking intra-family correlations into account, a mixed model regression analysis was performed. Family ID was entered as a random factor and a compound symmetry covariance matrix was conducted. First, main effects of the FFM traits, gender and group status on subclinical positive symptoms according to the CAPE were examined. Then interaction effects between the FFM traits and gender and between the FFM traits and group status were tested. The same procedure was repeated for CAPE subclinical negative symptoms.

3. Results

3.1. Normality

All FFM traits were normally distributed. The PANSS and CAPE scales showed positive skew in their distribution: most scores were clustered at the low values.