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Personality and psychotic disorders

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1

1. GENERAL INTRODUCTION

The subject of the current thesis is the contribution of normal personality traits as conceptualized by the Five-Factor Model of personality to the manifestation of illness in patients with psychotic disorders. These studies were part of the Dutch national Genetic Risk and Outcome of Psychosis (GROUP) study.

1.1 *Psychotic disorders*

A psychosis is a mental state characterized by loss of contact with reality, in the form of sensory perceptions (hallucinations) and/or tenacious beliefs (delusions), frequently accompanied by aberrant thought processes (formal thought disorders). A psychosis can occur due to a medical condition, due to use or withdrawal of a substance, in the context of a severe mood disorder, or in absence of any these conditions. In the latter case, a non-affective psychotic disorder may be diagnosed, namely schizophrenia, schizoaffective disorder, schizofreniform disorder, delusional disorder or psychotic disorder not otherwise specified. The exact diagnosis is mainly dependent on the type and duration of symptoms. Hallucinations, delusions and formal thought disorders are generally referred to as 'positive symptoms', as they refer to features normally absent in healthy subjects. By contrast, 'negative symptoms' refer to features normally present in healthy subjects, such as lack of motivation and reduced emotions, speech or movement. Individuals with schizophrenia, the most common non-affective psychotic disorder, may suffer from both positive and negative symptoms.

With a lifetime prevalence rate around 0.7%, approximately 26 million people worldwide are currently estimated to suffer from schizophrenia (Eaton et al., 2008). For the wider range of non-affective psychotic disorders, lifetime prevalence rate in the general population is estimated at approximately 1.5% (Perala et al., 2007). Although the majority of individuals with schizophrenia experience marked to severe impairment (Eaton et al., 2008), substantial variation in levels of functional impairment exist, even more so when the wider scope of non-affective psychotic disorders is considered. Also, type and severity of symptoms may vary greatly between patients, and over time. Additionally, apart from genetic vulnerability, a wide range of environmental factors, such as cannabis use (Moore et al., 2007), childhood trauma (Read et al., 2005) and urban environment (Krabbendam and van Os, 2005), have been identified as risk factors for the development of schizophrenia and related disorders, although no variable or combination of variables to date inevitably leads to onset of illness. In fact, after

decades of extended research, one of the most established facts about schizophrenia is its heterogeneity; in symptom expression, developmental course and etiopathology (Tandon et al., 2009). To better understand this heterogeneity, the GROUP study was conducted.

1.2 *The GROUP study*

The GROUP study is a three-wave longitudinal multicenter cohort study, designed to study vulnerability and resilience factors for the wide variation in expression and course of non-affective psychotic disorders. The GROUP study was developed by four university departments of psychiatry in the Netherlands: Amsterdam, Groningen, Maastricht and Utrecht. Each center formalized collaborations with mental health care institutions in their region. Apart from patients with non-affective psychotic disorders and healthy control subjects, first-degree family members (siblings and parents) of participating patients were recruited. The participation of non-affected first-degree family members of patients is thought to offer a unique possibility to study potential pathogenetic mechanisms and predictors of functioning in a non-clinical population with an increased genetic risk, without confounding disease or therapy related factors (Korver et al., 2012). Patients were recruited through clinicians working in regional mental health care institutions or in academic centers. Eligible patients were given explanation of study procedures and were asked for informed consent and permission to contact their first-degree family members. Controls were mainly selected through a system of random mailings. Inclusion criteria for patients were: (1) age between 18 and 50 (extremes included), (2) meeting DSM-IV criteria (American Psychiatric Association, 2000) for a non-affective psychotic disorder, (3) maximum duration of illness of 10 years, (4) fluent in Dutch and (5) able and willing to give informed consent to study procedures. Siblings were between 18 and 50 years of age and had no lifetime diagnosis of psychosis. For parents, the age criterion did not apply. 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 lifetime diagnosis of psychosis. Inclusion started in 2005 and continued until 2008. All participants except the parents were invited for reassessment between 2008 and 2011, and again between 2011 and 2014. More detailed information on the GROUP study design, objectives, recruitment and assessment procedures and sample characteristics are described elsewhere (Korver et al., 2012). The majority of the studies described in the current thesis pertain to a subsample of the GROUP study, who participated in personality assessment according

to the Five-Factor Model of personality in the second GROUP assessment period (data collected between 2008 and 2011).

1.3 The Five-Factor Model of personality

The Five-Factor Model (FFM) is one of the most well-known and widely used models of normal personality. For the greater part, the FFM originates from the 'lexical hypothesis', a major scientific theory in personality psychology based on the postulate that all relevant aspects of normal personality variation is captured in natural language. Researchers in the twentieth century hypothesized that a small number of 'core' dimensions of personality could be distilled from a large numbers of trait descriptors through the use of factor analytic techniques, eventually leading to the identification of the FFM by, among others, Digman (1990) and Goldberg (1990). Costa and McCrae subsequently developed one of the leading questionnaires for assessment of the FFM: the NEO Personality Inventory-Revised (NEO-PI-R), of which the NEO Five Factor Inventory (NEO-FFI) is the abbreviated version (Costa and McCrae, 1992). The FFM as conceptualized in the NEO-PI-R /-FFI consists of (1) Neuroticism: the vulnerability to emotional instability and self-consciousness, (2) Extraversion: the tendency to be warm and outgoing, (3) Openness: the cognitive disposition to creativity and aesthetics, (4) Agreeableness: the tendency to be sympathetic, trusting and altruistic and (5) Conscientiousness: the tendency towards dutifulness and competence (Costa and McCrae, 1992). These five traits are thought to represent the major dimensions in personality variation- that is, a relatively small set of roughly independent axes along which people differ in their typical behavioral tendencies (Ashton and Lee, 2005). Good convergent and discriminant validity across peer, self and spouse rating has been demonstrated for the FFM in the general population (Costa and McCrae, 1992; Costa, Jr. and McCrae, 1988), along with cross-cultural applicability (De Fruyt et al., 2009; McCrae and Costa, Jr., 1997) and long-term temporal stability (Costa and McCrae, 1994; Roberts et al., 2006).

Over the past few decades, numerous studies have examined the relationships between FFM personality traits and various forms of psychopathology. As a whole, internalizing pathology is often linked to higher Neuroticism (Griffith et al., 2010), whereas lower Agreeableness may be specific for externalizing pathology (Ruiz et al., 2008; Kotov et al., 2010). In a meta-analysis of 175 of studies on relations with common mental disorders (various depressive, anxiety and substance use disorders) (Kotov et al., 2010), distinct relations were found. In this meta-analysis, higher Neuroticism and lower

Conscientiousness were found to be related to all diagnoses, lower Extraversion to most diagnoses, lower Agreeableness only to substance use disorders, and Openness not to any diagnosis. Regarding psychotic disorders, two reviews showed the most consistent findings to date to be links with higher levels of Neuroticism and lower levels of Extraversion (Andersen and Bienvenu, 2011; Dinzeo and Docherty, 2007), although findings may be obscured by frequent lack of assessment of all five FFM traits. Furthermore, specifically how FFM personality traits relate to psychotic disorders is unclear.

1.4 Models of personality and psychopathology

There are several major models of inter-relations between personality and psychopathology, which may explain relations between FFM personality traits and psychotic disorders (Andersen and Bienvenu, 2011). Three of these models will be discussed below:

The vulnerability model states that certain personality traits predispose individuals to develop psychopathology. Traits may either cause the development of a disorder directly, or enhance the impact of stressful life-events, as is conceptualized in the diathesis-stress scenario (Nuechterlein et al., 1994). Conversely, certain personality traits may confer protection against the development of a psychiatric condition. For patients with psychotic disorders, there is empirical support for the vulnerability model. Premorbid higher levels of Neuroticism, and other traits that reflect a vulnerability to worry and be distressed, have been identified as a risk factor for the development of schizophrenia, also when controlling for co-morbid psychiatric disorders and various childhood adversity factors, (van Os and Jones, 2001; Goodwin et al., 2003; Lonnqvist et al., 2009; Krabbendam et al., 2002), while a higher level of Extraversion has shown to reduce the risk (van Os and Jones, 2001).

Second, *the pathoplasty model* states that personality traits and psychopathology are independent constructs, and that personality traits exert an indirect impact on the manifestation of illness, such as course of illness, associated functional impairment and treatment response. In patients with psychotic disorders, there is also support for the pathoplasty model. FFM personality traits have been linked to a wide range of clinical phenomena in patients with psychotic disorders (Dinzeo and Docherty, 2007). For instance, lower Agreeableness has been found to predict higher levels of positive symptoms at one year follow-up, when baseline levels of positive symptoms were controlled for (Lysaker and Taylor, 2007).

Third, *the scar model* states that, rather than personality affecting illness, a mental disorder may affect levels of personality traits. In regard to schizophrenia, the scar model dates back to its very first conceptualization. Early psychopathology experts, such as Krapelin and Bleuler, described a perceived deterioration of normal personality in patients with schizophrenia, leading to the long-held belief that psychotic disorders permanently damages ('scars') the personality. Empirical evidence for this hypothesis, however, is surprisingly scarce – and inconclusive. There is some evidence that 'scarring' may occur: a twin study found twins discordant and concordant for schizophrenia to have higher levels of Neuroticism and lower Extraversion, while the unaffected twins had personality profiles comparable to controls (DiLalla and Gottesman, 1995). On the other hand, there is indication for short-term stability of the FFM traits in patients with psychotic disorders despite fluctuations in positive symptoms (Kentros et al., 1997; Beauchamp et al., 2006), which is contra-indicative of 'scarring'. Also, the scar model cannot explain the prospective association between personality and first-onset psychotic disorder, after adjustment for baseline symptoms.

In sum, more than one model of interrelations between personality and pathology may apply for psychotic disorders. For the greater part, the models are not mutually exclusive. The possible exception is the scar model vs. the pathoplasty model. If FFM personality traits are substantially affected by psychotic symptomatic states after onset of illness, FFM traits may no longer provide independent information, above and beyond that provided by psychotic symptoms (Kentros et al., 1997). This would make the assessment of FFM traits in psychotic disorders a basically pointless exercise. As FFM personality traits have been found to predict outcome which is highly clinically relevant in patients with psychotic disorders, such as symptom exacerbation (Lysaker and Taylor, 2007) and psychotic relapse (Jonsson and Nyman, 1991; Gleeson et al., 2005), it is of clinical relevance to investigate this matter.

1.5 Aims and outline of this thesis

The main objective of this thesis was to examine whether normal personality traits as conceptualized by the FFM contribute to the vast heterogeneity found in expression of psychotic disorders. Second, we aimed to better understand how FFM personality traits may be connected to symptom expression in patients with psychotic disorders, i.e. to relate our findings to the different models of inter-relationships between personality and psychopathology.

Chapter 2 addresses the second aim, by examining the three-year temporal stability of the FFM personality traits in patients with psychotic disorders, while taking changes in positive, negative, disorganization and depressive symptom levels into account. If changes in symptoms are found to be related to changes in FFM personality traits, support for the scar model would be obtained.

Chapter 3 focusses on levels of FFM traits in patients with psychotic disorders, their siblings and healthy controls. Intermediate levels of FFM traits in siblings of patients with psychotic disorders may provide support for the vulnerability model. Also, the possible contribution of FFM personality traits to type and severity of (subclinical) psychotic symptoms is investigated, in all three groups. All three models may be applicable for explaining relations between FFM personality traits and (subclinical) psychotic symptoms.

In **Chapter 4** a possible contribution of FFM personality traits to comorbidity is investigated, by examining associations between FFM personality traits and a liability for obsessive-compulsive symptoms in patients with psychotic disorders and their siblings. Similar relations between FFM traits and obsessive-compulsive symptoms in both patients and siblings would be in line with the vulnerability model. In order to ascertain whether obsessive-compulsive symptoms can be reliably assessed in patients with psychotic disorders, the factor structure and reliability of the Yale-Brown Obsessive-Compulsive scale (Y-BOCS) (Goodman et al., 1989) is first examined.

Chapter 5 focusses on a possible contribution of FFM personality traits to quality of life in patients with psychotic disorders, by examining the relative contribution of symptoms, FFM personality traits and adult attachment styles on different domains of subjective quality of life. If FFM traits are able to predict subjective quality of life when symptom levels are controlled for, indirect support for the pathoplasty model may be obtained.

Chapter 6 addresses the question whether FFM traits can help explain worse functional outcome reported in patients with psychotic disorders who experienced childhood traumatic events. The possible mediating role of FFM traits is here examined.

In **Chapter 7** a summary of the findings of the previous chapters is presented, along with a general discussion of these findings and suggested directions for future research. Finally, this thesis concludes with a Dutch summary and other addendums.

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