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Personality traits predicting quality of life and overall functioning in schizophrenia

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ABSTRACT

Introduction: Clinical symptoms and sociodemographic variables predict level of functioning and quality of life in patients with schizophrenia. However, few studies have examined the effect of personality traits on quality of life and overall functioning in schizophrenia. Personality traits are premorbid to illness and may predict the way patients experience schizophrenia. The aim of this study was to examine the individual and additive effects of two core personality traits—neuroticism and extraversion—on quality of life and functioning.
Methods: Patients with schizophrenia-spectrum disorders ($n = 153$) and healthy controls ($n = 125$) completed personality and quality of life questionnaires. Global functioning was assessed during a clinician-administered structured interview. Neuroticism and extraversion scores were analyzed both as continuous variables and as categorical extremes (High versus Normal Neuroticism, Low versus Normal Extraversion).
Results: Quality of life was significantly associated with neuroticism, extraversion, and the neuroticism × diagnosis and extraversion × diagnosis interactions. For patients, a lower neuroticism score (in the normal range) was associated with quality of life scores comparable to controls; whereas high neuroticism scores in patients were associated with the lowest quality of life. For overall functioning, only diagnosis had a significant effect.
Conclusion: Neuroticism modulates quality of life and may provide an important key to improving the life of patients with schizophrenia.

1. Introduction

Quality of life and overall functioning are important clinical outcomes in psychiatry. They represent crucial benchmarks for a more personalized approach to patient care. While people with psychiatric disorders are generally at risk of poor functioning and poor quality of life, those with schizophrenia are especially affected (Bobes et al., 2007). Quality of life is lower in schizophrenia patients who are younger, have more psychotic symptoms, have less contact with family, are in worse financial situations, and have achieved lower levels of education (Bobes et al., 2007; Gardsjord et al., 2016). Overall functioning is lower in schizophrenia patients with more negative symptoms or are unemployed (Chabungbam et al., 2007; Herbener and Harrow, 2004; Rabinowitz et al., 2012). However, much remains unknown about these diagnosis-specific impairments in quality of life and functioning.

Quality of life and overall functioning in schizophrenia can be predicted by antecedent risk factors of the illness, such as temperament and personality (Barrantes-Vidal et al., 2009; Boyette et al., 2014b; Compton et al., 2015; Herrán et al., 2006; Kentros et al., 1997; Lahey, 2009; Lysaker et al., 1998). For example, neuroticism and extraversion are associated with quality of life and overall functioning in schizophrenia (Boyette et al., 2014b; Lahey, 2009; Lysaker et al., 1998), and the effect on quality of life persists when controlling for symptoms and sociodemographic factors (Boyette et al., 2014a,b; Kentros et al., 1997). Moreover, higher neuroticism and lower extraversion are linked to factors that contribute to quality of life, such as passive, avoidant coping, deficits in intrinsic motivation, and greater emotional discomfort (Lysaker et al., 2004; Lysaker and Taylor, 2007; Vohs et al., 2013). Similarly, neuroticism is negatively associated with overall functioning, while extraversion, agreeableness, and conscientiousness are positively associated with overall functioning (Compton et al., 2015). In addition, higher neuroticism and agreeableness scores predict relapse after first-episode psychosis (Gleeson et al., 2005).

While previous studies have demonstrated the predictive value of personality factors for quality of life and overall functioning in schizophrenia, the potential additive effects of personality factors have yet to be explored. For example, a patient with schizophrenia who has both high neuroticism and low extraversion may be more socially isolated, have more trouble holding a job, and have trouble responding to stressful situations—compared to a patient with only high neuroticism or low extraversion—, leading to poor quality of life and overall functioning. Thus, the combined effect of neuroticism and extraversion may represent a more significant risk profile for patients. Furthermore, previous

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studies examined personality factors in psychotic patients only, though quality of life and overall functioning can be measured in healthy controls as well. Finally, research to date has examined personality factors as continuous variables, although using categorical measures may be more likely to influence clinical treatment (Kagan and Snidman, 2004).

The present study tested the hypothesis that the personality factors neuroticism and extraversion are associated with overall functioning and quality of life in patients with schizophrenia. We hypothesized that the combination of neuroticism and extraversion would predict quality of life and overall functioning, such that patients with higher neuroticism and lower extraversion would have the poorest quality of life and functioning. We also hypothesized that categorical methods for defining personality would be better at predicting quality of life and overall functioning, such that those with "high" neuroticism and "low" extraversion would have the poorest overall functioning and quality of life. Ultimately, we hope that these extreme categories could make it easier for clinicians to identify patients with schizophrenia who are at risk of poor subjective quality of life and overall functioning.

2. Methods

2.1. Setting and sample

Participants were recruited as part of an ongoing research study and included 153 patients with schizophrenia-spectrum disorders (38 schizoaffective, 77 schizophrenia, 38 schizophreniform) and 125 healthy control subjects. Psychosis patients were recruited from the Vanderbilt Psychiatric Hospital; healthy controls were recruited via community advertisements. The Vanderbilt University Institutional Review Board (Nashville, Tennessee) approved the study protocol and all subjects completed informed consent. Subjects were considered for the study if they were between the ages of 14 and 65, had pre-morbid IQ scores >70, were not pregnant or lactating, did not suffer from a chronic medical illness (such as diabetes or heart disease) or a central nervous system disorder (such as multiple sclerosis or epilepsy) that might affect the study results, and did not have a history of traumatic brain injury. Control subjects were included if they did not have a history of a psychiatric disorder and patients were included if they had no substance abuse within the last three months. Participants completed self-report measures of personality and quality of life. Trained research staff performed a Structured Clinical Interview of the DSM-IV-TR (SCID) (First et al., 2001). The SCID was used to confirm diagnoses and symptom experiences in patients and to rule out past or present psychiatric illness in psychiatrically-healthy controls. A Global Assessment of Functioning (GAF) score was assigned to each subject as a measure of current level of overall functioning (see Table 1 for subject characteristics).

Table 1
Subject demographic characteristics.

	Schizophrenia Patients ($N = 153$)	Healthy Controls ($N = 125$)	p-Value*
Mean Age	32.35 ± 1.00	30.83 ± 1.03	0.29
Sex			0.16
Male	103	74	
Female	50	51	
Race			0.28
White	93	86	
Black/African American	52	34	
Other	8	5	
Mean Parental Education	13.88 ± 0.28	14.53 ± 0.19	0.05
Mean Age at Onset of Illness	21.08 ± 0.47	–	–
Mean Duration of Illness	10.34 ± 1.19	–	–
Mean Chlorpromazine Equivalent	468.46 ± 26.48	–	–
Mean PANSS Score			
Positive Subscale	18.35 ± 0.54	–	–
Negative Subscale	16.15 ± 0.61	–	–
General Subscale	32.15 ± 0.67	–	–

* $p < 0.05$.

2.2. Measures and rating scales

2.2.1. Personality: neuroticism and extraversion

All participants completed the NEO Five-Factor Inventory (NEO-FFI), a well-validated personality self-report questionnaire commonly used in mental health research (Costa and McCrae, 1992). For this study, we focused on the personality traits of Neuroticism and Extraversion based on past research findings (Camisa et al., 2005; Compton et al., 2015; Dinzeo and Docherty, 2007). Neuroticism and Extraversion scores are continuous, ranging from 0 to 48. In a normative sample, the mean Neuroticism subscale score was 15.77 ± 7.47 and the mean Extraversion subscale score was 28.50 ± 6.26 (McCrae and Costa, 2004). Therefore, in addition to the continuous measure, we created categorical variables for High/Normal Neuroticism and Low/Normal Extraversion using the top/bottom 25% of neuroticism and extraversion scores based on the normative distributions (neuroticism scores >20.8 and extraversion scores <24.3). This cut-off was chosen to balance standard cut-offs in extreme groups research (typically ±1 standard deviation or 15%) and practical constraints of having sufficient sample size in the extreme groups (Blackford et al., 2011; Kagan et al., 1988).

2.2.2. Quality of life

All participants completed the Quality of Life Enjoyment and Satisfaction Questionnaire, Short Form (Q-LES-Q-SF), which is a self-report measure of perceived quality of life during the past week (Endicott et al., 1993). The reliability and validity of the Q-LES-Q-SF have been verified in independent studies using both healthy controls and patients with schizophrenia and we found similarly high reliability in both groups in the present study (Rapaport et al., 2005; Ritsner et al., 2005; Stevanovic, 2011). The questionnaire is regularly used to measure quality of life in mental health research and in clinical settings. QLES-Q-SF scores are typically expressed as a percent of the maximum score of 70 and in a normative sample, the mean percent maximum score is 0.83 (Rapaport et al., 2005).

2.2.3. Global functioning

Participants were evaluated using the Global Assessment of Functioning (GAF), which is the final component of the multiaxial diagnostic categorization scheme used in *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (American Psychiatric Association, 2000). The GAF is rated on a 0–100 scale; higher scores represent better overall functioning. The reliability and validity of the GAF scale have been verified previously (Startup et al., 2002). Furthermore, GAF scores are frequently used to measure overall functioning in both clinic and research settings.

2.3. Data analyses

To determine whether the personality traits of neuroticism and extraversion differed as a function of diagnosis (patients/controls), a binomial logistic regression was performed with neuroticism, extraversion, and the neuroticism × extraversion interaction as predictor variables and diagnosis as the outcome variable. For the categorical personality variables, a Cochran-Mantel-Haenszel test was used to examine the association between diagnosis, high neuroticism, and low extraversion.

To assess the effects of diagnosis, neuroticism, and extraversion on quality of life and functioning, analyses of variance (ANOVA) were performed. Diagnosis (dummy coded), neuroticism, extraversion, and their two- and three-way interactions were included as predictors. Neuroticism and extraversion were centered to remove the inherent collinearity with interaction terms. Separate ANOVAs were performed for quality of life and for global functioning. For the categorical analyses, the

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