



The state effect of depressive and anxiety disorders on big five personality traits

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ABSTRACT

Background: Neuroticism and extraversion are affected by depressive disorder state. Less is known about depressive state effects on conscientiousness, agreeableness and openness. Furthermore, state effects of anxiety disorders on personality have been far less studied than those of depressive disorder. Here, we aim to determine the extent of change in all five personality traits associated with the occurrence of or recovery from depressive and anxiety disorders.

Methods: Using the Composite International Diagnostic Interview (CIDI) at baseline and two-year follow-up, respondents from the Netherlands Study of Depression and Anxiety (NESDA) were divided into four groups: unaffected at baseline and follow-up, occurrence, recovery, and affected at baseline and follow-up. Personality change (NEO-five factor inventory) was examined in the occurrence and recovery groups relative to the unaffected and affected groups, respectively. Analyses were repeated, differentiating between (specific) depressive and anxiety disorders.

Results: We found small state effects of affective disorders on neuroticism, extraversion and conscientiousness. Corrected for each other, both depressive and anxiety disorders showed small state effects on neuroticism, but effects on extraversion and conscientiousness were mainly associated with depressive disorders.

Conclusions: State effects were small. When assessing neuroticism, the presence of both depressive and anxiety disorders should be taken into account, as both may independently increase neuroticism scores. However, when assessing extraversion and conscientiousness, depressive disorders but not anxiety disorders are likely to be of influence. Agreeableness and openness are influenced by neither.

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1. Introduction

The stability of personality traits has been subject to debate. One of the most prominent personality models is the Five-Factor Model of Personality (McCrae and Costa, 1996), which distinguishes five higher order traits: neuroticism, extraversion, conscientiousness, agreeableness and openness. Originally these traits were assumed to be exclusively biological in origin, to be unaffected by effects of the environment, and to mature until early adulthood and from then on to remain stable over time (McCrae and Costa, 1999; Terracciano et al., 2010). However, there is some evidence that personality traits are susceptible to gradual change over time (Srivastava et al., 2003; Roberts et al., 2006), or, as shown recently, when suffering from a depressive episode (Costa et al., 2005).

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Indeed, studies have found neuroticism to increase and extraversion to decrease during depressive episodes, either temporarily (the state effect; Griens et al., 2002; Ormel et al., 2004), or even permanently in some (the scar effect; Kendler et al., 1993), but not all (Shea et al., 1996; Ormel et al., 2004; Jylhä et al., 2009) studies. While most studies focused on change in neuroticism (Ormel et al., 2004) and sometimes change in extraversion (Jylhä et al., 2009), less is known about changes in conscientiousness, agreeableness, or openness, although some studies have found them to be stable during a depressive episode (Harkness et al., 2002; Malouff et al., 2005; Morey et al., 2010). Also, compared to depression, change in personality in association with occurrence of or recovery from anxiety disorders has been far less studied (Bienvenu and Brandes, 2005). There is limited evidence that neuroticism decreases and extraversion increases when anxiety symptoms ameliorate in patients with panic disorder and agoraphobia (Reich et al., 1986) as well as in patients with depressive disorder (Jylhä et al., 2009).

Rarely have depressive and anxiety disorders been studied together in their association with change in personality. However, depressive and anxiety disorders often co-occur, therefore, the association of either depressive disorders or anxiety disorders with change in personality may be confounded by the other when studied separately.

In order to study the association of change in personality trait scores with change in depressive and anxiety disorders, longitudinal within subject designs are needed. In this study using baseline and 2-year follow-up data from a large longitudinal cohort study, we will investigate the association of change in personality trait scores with the onset of and the recovery from depressive and anxiety disorders, known as the state effect. The aim of our study is to determine the extent of change in all five personality traits associated with the occurrence of or recovery from depressive and anxiety disorders. Based on the existing literature, we expect the change in neuroticism and extraversion trait scores to be associated with the occurrence of and recovery from both depressive and anxiety disorders.

2. Methods

2.1. Sample

Data are from an 8-year longitudinal cohort study, the Netherlands Study of Depression and Anxiety (NESDA) on the predictors, course and consequences of depressive and anxiety disorders. Depressive disorders under study are Major Depressive Disorder (MDD) and Dysthymia (Dys), anxiety disorders under study are Social Phobia (SP), Panic Disorder (PD), Agoraphobia (AGO) and Generalized Anxiety Disorder (GAD). A general exclusion criterion was the presence of a clinical diagnosis of major psychiatric disorders other than depressive or anxiety disorder (e.g. psychosis, bipolar disorder, severe addiction disorder). Assessments consisted of face-to-face interviews with additional data collection by means of written questionnaires. NESDA recruited respondents from three different settings, i.e., general population ($n = 564$), primary care ($n = 1610$), and mental health organizations ($n = 807$), resulting in a total of 2981 respondents. The study protocol was approved centrally by the Ethical Review Board of the VU University Medical Center and subsequently by local review boards of each participating center. After full verbal and written information about the study, written informed consent was obtained from all participants. This research was conducted in accordance with the Declaration of Helsinki. For more information on NESDA, its rationales and methods, see Penninx et al. (2008).

Of the 2981 respondents in NESDA, 2596 (87.1%) participated in the 2-year follow-up interview. Non-response was significantly higher among those with younger age, lower education, non-north European ancestry and depressive disorder, but was not associated with gender or anxiety disorder (Lamers et al., 2011). Of the remaining 2596 respondents, 2470 completed the personality questionnaires required for the current study. For statistical analyses, missing values were imputed using multiple imputation by means of Predictive Mean Matching based on all variables in our analyses (i.e., gender, age, CIDI diagnoses, NEO-FFI personality scale scores, BAI total scores, and IDS-SR₃₀ total scores), in SPSS 18. We used five sets of imputed data. Based on affective disorder status at baseline and two-year follow-up, the sample was divided into four groups: (1) unaffected, i.e. no disorder on baseline and two-year follow-up; (2) occurrence, i.e. no disorder on baseline, disorder on two-year follow-up; (3) recovery, i.e. disorder on baseline, no disorder on two-year follow-up; (4) affected, i.e. disorder on baseline and two-year follow-up. Details on these groups following imputation will be provided further below.

2.2. Measures

2.2.1. Affective disorder status

The presence (yes/no) of depressive (MDD, Dys) or anxiety (SP, PD, AGO, GAD) disorder at baseline and two-year follow-up were assessed using the depression and anxiety sections of the Composite International Diagnostic Interview (CIDI, lifetime version 2.1; World Health Organization, 1997). The CIDI is a highly structured interview, designed to provide diagnoses according to both the International Statistical Classification of Diseases and Related Health Problems (ICD) and the DSM-IV and to be administered by laypersons. It is a highly reliable and valid instrument for assessing depressive and anxiety disorders (Wittchen, 1994). The interviews were performed and taped by clinical research assistants who had undergone one week of intensive training by a certified CIDI trainer.

2.2.2. Personality

Personality at baseline and two-year follow-up was assessed using the NEO-five factor inventory (NEO-FFI), a 60-item personality questionnaire measuring five personality domains: neuroticism, extraversion, agreeableness, conscientiousness, and openness to experience (McCrae and Costa, 1996). The NEO-FFI has been found to have adequate internal and temporal reliability (both ranging from .75 to .87 across scales; Murray et al., 2003).

2.2.3. Covariates

Age and gender were included as basic socio-demographic covariates, as they have been found to be related to both psychopathology (Ansseau et al., 2008) and change in personality (Srivastava et al., 2003). Also, we corrected for depressive symptom severity using the Inventory for Depressive Symptoms - Self Report (IDS-SR₃₀; Rush et al., 1986) and anxiety symptom severity using the Beck Anxiety Inventory (BAI; Beck et al., 1988). Covarying baseline depression and anxiety severity removes a priori differences in symptom severity, thus focussing our analyses on stability versus change from baseline onwards.

2.3. Statistical analyses

First, we assessed whether there were any changes in personality traits between baseline and two-year follow-up. For this analysis, we used paired sample *t*-tests.

Second, to more specifically examine if change in personality trait scores is associated with the occurrence of and recovery from affective disorder, we proceeded with specific comparisons between the affective disorder status groups using regression analysis. For each personality trait, change scores of the occurrence group were compared with those of the unaffected group and change scores of the recovery group with those of the affected group. To accomplish this, two contrast variables (Rosenthal et al., 2000) were included in these analyses, contrasting 1) occurrence of affective disorder with no affective disorder at baseline and two-year follow-up, and 2) recovery from affective disorder with affective disorder at baseline and two-year follow-up. In this and all following analyses imputed data were used in order to avoid biased estimates. Analyses on personality differences at baseline or follow-up were corrected for age, gender, baseline or follow-up depressive symptom severity, and baseline or follow-up anxiety symptom severity. As the amount of change between baseline and follow-up may depend on baseline trait scores, analyses on change in personality were corrected for baseline personality trait score. The five main analyses of change in personality were additionally corrected for age, gender, baseline depressive symptom severity, and baseline anxiety symptom severity.

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