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## A longitudinal study of facets of extraversion in depression and social anxiety

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### ABSTRACT

The present study examines the relationship of lower level facets of extraversion with depression and social anxiety. A sample of 2942 adults aged 18–65, consisting of healthy controls, persons with a prior history of emotional disorders, and persons with a current emotional disorder were assessed at baseline (T0) and 2 (T2) and 4 years (T4) later. At each wave anxiety and depressive disorder according to DSM-IV criteria, symptom severity and facets of extraversion (positive affectivity, sociability and activity) were assessed. Using structural equation modeling we found that trait depression had a large association with lack of positive affectivity, while trait social anxiety showed moderately strong associations with both low sociability and lack of positive affectivity. Facet-level analyses increase the specification of associations of personality constructs with particular forms of psychopathology. Given the role of positive emotions in resilience against depression and possibly social anxiety, interventions directly aimed at increasing positive emotions seem warranted.

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### 1. Introduction

The assumption that personality is related to mental health has generated a long tradition of research. A recent comprehensive review of the associations of higher order personality traits in the Big Three and Big Five models (i.e., neuroticism, extraversion, disinhibition, conscientiousness, agreeableness, and openness) and depressive, anxiety, and substance use disorders in adults, showed that all diagnostic groups score high on neuroticism and low on conscientiousness. Many disorders are also associated with low levels of extraversion, with the largest effect sizes for dysthymic disorder and social anxiety disorder (Kotov, Gamez, Schmidt, & Watson, 2010).

Most of the literature on personality and emotional disorders has focused on the broad traits of neuroticism and extraversion. Whereas different disorders may be characterized by similar general levels of neuroticism or extraversion, more powerful or more specific associations with psychopathology might exist at the lower levels in the personality trait hierarchy (Klein, Kotov, & Bufferd, 2011). Examining these relations at both trait and facet

levels is necessary to identify the specific level driving a given association (Naragon-Gainey, Watson, & Markon, 2009).

Here we will focus on facets of extraversion in relation to depression and social anxiety as these disorders have shown consistent relationships with the general trait of extraversion in numerous previous studies (Kotov et al., 2010). Extraversion can be conceptualized as a multidimensional higher order trait that includes interpersonal/social as well as positive emotional aspects (Watson & Clark, 1997). Although facets of extraversion are named differently and inconsistently in the literature, extraversion typically includes the following major facets: affiliation (warmth and gregariousness), positive affectivity (joy and enthusiasm), energy (liveliness and activity), and ascendance (exhibitionism and dominance) (Watson & Clark, 1997). In relation to depression and social anxiety it is pertinent to understand whether the higher order trait of extraversion is the most relevant level to understand depression and social anxiety or whether lower order facets yield additional and more specific information to understand their interrelationships.

Only a very limited number of studies have simultaneously assessed the relation of different facets of extraversion with depression or social anxiety, with mixed results. Examining the six extraversion facets of the Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992), Bienvenu et al. (2004) found that persons diagnosed with life time depression only scored lower

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on assertiveness than controls in a community sample, while persons with life time social phobia obtained lower scores for all facets, in particular for warmth and positive affectivity. Using multiple regression analyses only low warmth as one of the extraversion facets of the NEO PI-R predicted severity of depression in acutely depressed persons (Costa, Bagby, Herbst, and McCrae, 2005), whereas only low positive affectivity was predictive of depression severity in college students (Chioqueta & Stiles, 2005). Of special note is a recent study of Naragon-Gainey et al. (2009), who found that symptoms of social anxiety were related to all four analyzed facets of extraversion (sociability, ascendance, positive emotionality, fun-seeking), whereas depressive symptom severity correlated strongly only with low positive emotionality. Although this study, in contrast to the earlier study of Bienvenu et al. (2004), did control for the high co-variation of depression with social anxiety, the study was limited to self-report severity measures and no formal psychiatric diagnoses were made. Data on the association of facets of extraversion with psychiatric diagnoses of depression, social anxiety and other disorders while accounting for their high comorbidity are in need of further investigation (Naragon-Gainey et al., 2009; Watson & Naragon-Gainey, 2010). Moreover, as self-reported levels of extraversion are contaminated by the presence of a depressive or social anxiety disorder (Spinhoven, van der Does, Ormel, Zitman, & Penninx, 2013), a longitudinal study allowing the examination of associations between stable levels of extraversion, depression and social anxiety may attenuate this contamination because of state effects.

To summarize, the overall aim of the present longitudinal study is to assess the importance of lower order facets of extraversion (i.e., positive affectivity, sociability and activity) in depression and social anxiety. More specifically, we will investigate: (a) which facets of extraversion characterize depression and social anxiety compared to other emotional disorders and controls; and (b) which facets of extraversion show differential relations with depression and social anxiety. We expected lower positive affectivity and lower sociability in depression and social anxiety compared to other anxiety disorders and controls. Moreover, we expected lower levels of positive affectivity in depression than in social anxiety, and lower levels of sociability in social anxiety than in depression.

## 2. Materials and methods

### 2.1. Sample

The Netherlands Study of Depression and Anxiety (NESDA) is an ongoing cohort study designed to investigate determinants, course and consequences of depressive and anxiety disorders. A sample of 2981 persons aged 18–65 years was included, consisting of healthy controls, persons with a prior history of depressive and anxiety disorders, and persons with a current depressive and/or anxiety disorder. Respondents were recruited in the general population, through a screening procedure in general practice, or when newly enrolled in specialized health care in order to represent different health care settings and different developmental stages of psychopathology. General exclusion criteria were a primary diagnosis of psychotic, obsessive compulsive, bipolar or severe addiction disorder and not being fluent in Dutch.

### 2.2. Procedure

A detailed description of the NESDA design and sampling procedures has been given elsewhere (Penninx et al., 2008). The baseline assessment included assessment of demographic and personal characteristics, a standardized diagnostic psychiatric interview and a medical assessment including blood sampling. The research

protocol was approved by the Ethical Committees of the participating universities and all respondents provided written informed consent. After two (T2) and four years (T4), a face-to-face follow-up assessment was conducted with a response of 87.1% ( $n = 2596$ ) at T2 and a response of 80.6% ( $n = 2402$ ) at T4.

### 2.3. Measures

#### 2.3.1. Psychiatric diagnosis

Presence of DSM-IV depressive [Major Depressive Disorder (MDD), Dysthymia (DYS)] or anxiety [Panic Disorder with or without Agoraphobia (PD), Social Anxiety Disorder (SAD), Generalized Anxiety Disorder (GAD), Agoraphobia without panic (AGO)] disorders was established using the Composite Interview Diagnostic Instrument (CIDI, version 2.1), a highly reliable and valid instrument for assessing depressive and anxiety disorders (ter Smiten, Smeets, & van den Brink, 1998; Wittchen, 1994), which determined prevalence of DSM-IV classified depressive (MDD, DYS) or anxiety (PD, SAD, GAD, AGO) disorders at T0, T2, and T4.

#### 2.3.2. Symptom severity

Depression severity at each wave was measured by the Inventory of Depressive Symptomatology (IDS). The IDS is a 30-item self-report questionnaire to measure severity of depressive symptoms, which has shown high correlations with observer-rated scales such as the Hamilton Depression Scale (Rush, Gullion, Basco, Jarrett, & Trivedi, 1996). Social avoidance severity was measured with the 15-item *Fear Questionnaire*, which has been found to be a reliable and valid measure for different types of phobic avoidance (FQ; Marks & Mathews, 1979). The five-item subscale for social phobia is strongly related to social anxiety and discriminates between categories of phobics in the expected way (Van Zuuren, 1988).

#### 2.3.3. Extraversion

Extraversion was measured at each wave using the NEO-FFI personality questionnaire, a 60-item questionnaire measuring 5 personality domains: neuroticism, extraversion, openness to experience, conscientiousness, and agreeableness (Costa & McCrae, 1992). In addition to the 5 broad personality domains, the NEO-FFI also reliably provides 13 item-cluster subcomponents (Chapman, 2007; Saucier, 1998). In the present study besides scale scores for the higher order trait of trait extraversion, also lower order facet scores for the following three four item-cluster subcomponents were calculated: positive affectivity, sociability and activity (Chapman, 2007; Saucier, 1998). These subcomponents correspond with three of the four major facets of extraversion as defined by Watson and Clark (1997) except for ascendance (positive affectivity, affiliation (sociability in the present study) and activity (energy in the present study). Alpha coefficients for extraversion measurements in the present study at T0 were: total score = .84; positive affectivity (i.e., light-hearted, cheerful, optimistic) = .85; sociability (gregarious, enjoys others, prefers company) = .65; activity (energetic, active, fast paced, action seeking) = .60. Test-retest reliabilities were: total score: .80 between T0 and T2 and .82 between T2 and T4 scores; positive affectivity: .75 and .79; sociability: .73 and .71; activity: .67 and .70.

### 2.4. Statistical analyses

On the basis of CIDI diagnoses at T0, T2 and T4 five different psychopathology groups were formed: (1) persons with a depressive disorder (Dys/MDD) and comorbid SAD (Dys/MDD + SAD) during the past five years; (2) persons with a depressive disorder, but no SAD (Dys/MDD) during the past five years; (3) persons with SAD, but no depressive disorder (SAD) during the past five years; (4) persons with another anxiety disorder (GAD, and/or PD, and/

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