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Type D personality and the Five-Factor Model: A facet-level analysis

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ABSTRACT

Objective: This study assessed the degree to which NEO-PI-R facets contribute to understanding of Type D personality over and above the Big 5. *Method:* Healthy participants (n = 268) completed the DS14 and the NEO-PI-R. In addition to analyzing the Type D subscales of social inhibition and negative affectivity, we computed a continuous measure of Type D scored as the sum of the two subscales. *Results:* Facets provided moderate incremental prediction of Type D subscales. The facets of assertiveness, self-consciousness, and positive emotion provided incremental prediction of negative affectivity, and warmth, activity, and gregariousness provided incremental prediction of social inhibition. Facets provided minimal incremental prediction of continuous Type D. The Big 5 explained substantially more variance in continuous Type D (71%) than negative affectivity (59%) or social inhibition (61%). *Conclusions:* Overall, the facet-level analysis provided additional insights into the nature of Type D. The incremental prediction of the Type D subscales by facets supported the idea that Type D scales are narrower constructs than the Big 5. However, the strong prediction of continuous Type D by the Big 5 and the lack of incremental prediction by facets points to the overall Type D construct being well represented by the Big 5.

1. Introduction

Type D personality is defined as the combination of high levels of both negative affectivity and social inhibition (De Fruyt & Denollet, 2002; Denollet, 2005; Denollet, Vaes, & Brutsaert, 2000). A growing body of research suggests that Type D personality may predict protracted morbidity in chronic patients, the onset of chronic illness, and a wide range of health-related outcomes (e.g., Denollet et al., 2000; Horwood, Chamravi, & Tooley, 2014; Williams & Wingate, 2012). In order to better understand the nature of the Type D construct, a number of studies have investigated the correlations of Type D subscales with the Big 5 factors of personality (i.e., neuroticism, extraversion, agreeableness, openness, and conscientiousness) (De Fruyt & Denollet, 2002; ĎUrka & Ruch, 2014; Grande, Romppel, Glaesmer, Petrowski, & Herrmann-Lingen, 2010; Sajadinejad, Molavi, Asgari, Kalantari, & Adibi, 2012; Svansdottir et al., 2012, 2013). These studies have shown the strong associations between the Big 5 and subscales of Type D, touched on issues related to the underlying dimensionality of the Type D construct, and raised the issue of whether Type D is merely a rebranding of extraversion and neuroticism. However, many dominant personality frameworks conceptualize personality as hierarchical in nature with broad factors at one level which are, in turn, composed of narrower facets (Costa & McCrae, 1992; Goldberg, 1992; John & Srivastava, 1999). In response to both the reductionism of the Big 5 and empirical observations of incremental prediction by facets, several researchers have called for more facet-level research (Anglim & Grant, 2014a; Ashton, Paunonen, & Lee, 2014). However, to date, there has been no published research on facet-level correlates of Type D personality. Thus, despite social inhibition and negative affectivity seemingly being more narrowly defined constructs than the Big 5 factors, it is not known whether personality facets provide a superior understanding of Type D. A facet-level analysis of Type D also has the potential to contribute to a range of debates about the nature of the Type D construct. Specifically, a lack of incremental prediction by facets would reinforce the view that Type D personality is merely a rebranding of the Big 5, whereas evidence of incremental prediction would serve to highlight the unique aspects of Type D personality.

1.1. Big 5 personality and Type D

While no facet-level analyses have been performed, several existing studies have correlated Type D personality with the Big 5 (De Fruyt & Denollet, 2002; Denollet, 2005; ĎUrka & Ruch, 2014; Grande et al., 2010; Sajadinejad et al., 2012; Svansdottir et al., 2012, 2013), typically using the NEO-FFI (Costa & McCrae,

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2008) to measure the Big 5. We present these individual study correlations and mean correlations in Supplementary data Table A1. Importantly, there are strong correlations between negative affectivity and neuroticism (mean $r = .74$) and between social inhibition and extraversion (mean $r = -.63$). More moderate correlations can also be seen for extraversion with negative affectivity, neuroticism with social inhibition, and agreeableness and conscientiousness with both Type D subscales. Such correlations suggest that Type D subscales have substantial overlap with the Big 5, but also that meaningful unique variance remains.

Despite the popularity of the Big 5, many researchers have advocated for the importance of examining lower level personality facets (Anglim & Grant, 2014a; Ashton et al., 2014). Although a range of facet-level frameworks have been proposed (Costa & McCrae, 1992; Goldberg, 1992; John & Srivastava, 1999), the Five-Factor Model where each factor is composed of six facets, as measured by the NEO-PI-R, (Costa & McCrae, 2008) is arguably the most well-established. While a number of papers have argued that incremental prediction of facets over factors adds substantially to the prediction of criteria (Ashton et al., 2014; Christiansen & Robie, 2011), methodological refinements suggest that such incremental prediction may be more modest in size (Anglim & Grant, 2014a). While, to the best of our knowledge, there has not been a facet-level analysis of Type D personality, there are reasons to expect that personality facets will incrementally predict Type D personality. Social inhibition and negative affectivity appear to be conceptualized more narrowly than the Big 5 are. While negative affectivity is similar to neuroticism, and social inhibition is similar to extraversion, both Type D subscales seem to focus on particular aspects of these broader Big 5 constructs. Thus, we might expect a modest incremental prediction of Type D whereby facets specifically related to affective states (i.e., anxiety (+), depression (+), and positive emotions (−)) would incrementally predict negative affectivity, and facets related to social interaction (i.e., gregariousness (−) and self-consciousness (+)) would incrementally predict social inhibition.

1.2. The Big 5 as predictors of subscale versus overall Type D scores

Despite existing research on how the Big 5 relates to Type D subscales, less is known about how the Big 5 relates to overall Type D. Type D is defined as a binary construct that is present when a person scores above a threshold on both Type D subscales. Despite the decision-making utility of categorical diagnoses, taxometric research both in general (Haslam, Holland, & Kuppens, 2012) and in relation to Type D (Ferguson et al., 2009) generally points to personality having an underlying continuous representation. Thus, it is important to examine not only how the Big 5 relates to the subscales of Type D, but also how the Big 5 relates to continuous representations of overall Type D. Although typically analyzed categorically, in one study De Fruyt and Denollet (2002) examined the correlates of the Big 5 with the first unrotated component of Type D items and found strong correlations with both neuroticism ($r = .71$) and extraversion ($r = -.57$). However, it is still unclear whether the Big 5 explains more or less variance in the overall scale than in the subscales. It is also unclear whether any incremental prediction of personality facets over factors will be larger or smaller for overall Type D in comparison to the subscales.

1.3. The present study

Thus, while existing studies have examined the relationship between Type D subscales and the Big 5, none have examined the relationship between Type D and personality facets. Furthermore, no studies have compared prediction by personality facets of a continuous measure of Type D with the subscales of Type D. The present study aimed to address this gap by applying recent statistical recommendations for the assessment of incremental facet prediction (Anglim & Grant, 2014a) using data on the DS14 and the NEO-PI-R for Type D and personality facet measurement, respectively.

2. Method

2.1. Participants and procedure

A total of 273 participants completed the study. Participants were removed if they met either of the following criteria: (1) greater than 10% missing data ($n = 4$), (2) Mahalanobis distance greater than 80 (suggested random responding) ($n = 1$). After exclusions, a total of 268 cases were used in the analyses. Ages ranged from 18 to 69 years ($M = 32.0$ $SD = 14.3$; 77% female). Of the sample, 87% were born in Australia, 2.2% identified as Indigenous Australians. English was the primary language for 97.8% of the sample. Participants were recruited via Australian social media sites. To enhance the distribution network the survey had an optional repost button at the end which allowed participants who had completed the survey to share the link with their friends/followers. Participants completed the study online, first answering demographic items, followed by the DS14 and the NEO-PI-R.

2.2. Materials

2.2.1. Type D personality scale (DS14)

The DS14 is a 14-item scale designed to measure Type D personality (Denollet, 2005). Items are rated on a five-point scale ranging from 0 = false to 4 = true. The measure consists of two 7-item subscales, negative affectivity and social inhibition, which are scored as the sum of respective items. An individual is classified as having Type D personality if they score 10 or more on both subscales (Denollet, 2005). In order to examine personality correlates with the overall composite measure, we also calculated a continuous measure of Type D as the sum of all 14-items, or equivalently, the sum of negative affectivity and social inhibition subscales. Though Type D can be conceptualized as the interaction of NA and SI (i.e. NA × SI), statistical and empirical arguments generally support the superiority of taking the sum rather than the product when combining variables to form a composite (Bobko, Roth, & Buster, 2007; Wang & Stanley, 1970). The idea of obtaining a continuous measure of Type D is similar to De Fruyt and Denollet (2002) who examined the first unrotated principal component of DS24 items. We prefer to use the sum instead of the first principal component, because Type D is defined as a formative construct that equally weights SI and NA, irrespective of whether SI and NA share variance.

2.2.2. NEO Personality Inventory Revised (NEO-PI-R)

The NEO-PI-R is a 240-item well-validated and widely adopted personality inventory measuring the Big 5 factors (neuroticism, extraversion, openness, agreeableness and conscientiousness) and 30 facets (Costa & McCrae, 1992, 2008). Factors and facets are arranged hierarchically such that each factor is composed of six facets. Items are rated on a 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Facet scores were obtained by taking the mean of constituent items after any necessary item-reversal. Factor scores were the mean of constituent facet scores. For example, the neuroticism factor score was the mean of anxiety, angry hostility, depression, self-consciousness, impulsiveness, and vulnerability facet scores.