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Screening for Personality Disorders: A Comparison of the Dimensional NEO-FFI with the Categorical SAPAS-SR[*]

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In psychiatric outpatients, the usefulness of the dimensional NEO-FFI as a screening instrument for personality disorders (PDs) was compared with the categorical screening instrument SAPAS-SR using the SCID-II as the gold standard. Major research questions are: 1) is the NEO-FFI a useful screening instrument for PDs? 2) does the NEO-FFI outperform a categorical screening instrument (SAPAS-SR)? 3) does combining both instruments improve the screening results? Extreme raising on Big Five personality trait domains (NEO-FFI) domain scores were examined in relation to the presence and the number of PDs as diagnosed, with to the SCID-II. Additionally, the NEO-FFI, in conjunction with a short self-report screening instrument (SAPAS-SR), was analysed with respect to sensitivity and specificity for screening of PDs. According to the SCID II, 97 patients (50%) were suffering from a PD. The majority of them had no (35.9%) or only one (40%) extreme score on one of the Big Five personality domains. There were no significant relationships between separate extreme traits on PD or five factor profiles, as proposed in the literature, and the presence of a SCID-II PD. Comparisons of the NEO-FFI with the SAPAS-SR showed no significant relationships. Using both screeners in conjunction resulted in an increase in specificity and the number of correctly classified cases at the expense, however, of the sensitivity. Correlation and regression analyses showed that personality traits are statistically significant predictors for each of the 12 PDs. However, the associations between NEO-FFI scores and the DSM-VI-TR PD criteria were rather modest. Support could not be obtained for the view that separate extreme scores on basic personality traits or combinations of such scores in five-factor profiles will provide adequate screening possibilities for PDs. The SAPAS-SR has better screening potential than the NEO-FFI or the SAPAS-SR and the NEO-FFI together.

Keywords: Personality Disorders; Big Five; Personality Screening Instrument

Introduction

Co-morbid personality disorders (PD) not only adversely affect the outcome of mental illnesses, but are also important factors in the choice of treatment options (Moran, Walsh, Tyrer, Burns, Creed, & Fahy, 2003; Newton-Howes, Tyrer, & Johnson, 2006). For this reason, assessment of the personality status should be a part of each initial psychiatric examination. Diagnostic instruments with an adequate psychometric profile, like the Structured Clinical Interview for DSM-IV Personality Disorders (SCID-II) (Spitzer, Williams, Gibbon, & First, 1990) and the Structured Interview for DSM-IV Personality Disorders-revised (SIDP-R) (Reich 1989), are well-known and accessible, but when it comes to daily reality, it is not always feasible to use these instruments in a clinical setting. Major reasons are that they are rather time-consuming and require trained personnel with a profound knowledge of psychopathology.

To reduce the time, inherent in full scale interviews, one might resort to one of the available short structured interviews for PD. Examples include the Standardized Assessment of Personality-Abbreviated Scale (SAPAS) (Moran, Leese, Lee, Wal-

ters, Thornicroft, & Mann, 2003), the Iowa Personality Disorder Screen (IPDS) (Langbehn, Pfohl, Reynolds, Clark, Battaglia, Bellodi et al., 1999), the Rapid Personality Assessment Schedule (PAS-R) (Van Horn, Manley, Leddy, Cicchetti, & Tyrer, 2000), and the Quick Personality Assessment Schedule (PAS-Q) (Germans, Van Heck, & Hodiamont, 2011) which all have screening capacity for PD in terms of the DSM-IV and ICD-10. However, it should be noted that even such short interviews require a great deal of specific clinical training.

An alternative for interviews are self-report measures. Examples include the Personality Diagnostic Questionnaire—Revised (PDQ-R) (Hyler, Skodol, Kellman, Oldham, & Rosnick, 1990) and the Assessment of DSM-IV Personality Disorders (ADP-IV) (Schotte, Doncker, Vankerckhoven, Vertommen, & Cosyns, 1998).

While saving time, these self-report questionnaires require patients who are able to read and write properly and maintain an adequate level of concentration, because questionnaires often contain over 100 items. Furthermore, self-report questionnaires generally tend to overrate the prevalence of PDs and to have poor specificity (Verheul &Van Den Brink, 1999).

To overcome concentration problems some of the relatively short structured interviews, like the Self-Report Standardized

Assessment of Personality-Abbreviated Scale (SAPAS-SR) (Germans, Van Heck, Moran, & Hodiamont, 2008), and the self-report version of the Iowa Personality Disorder Screen (IPDS) (Germans, Van Heck, Langbehn, & Hodiamont, 2010), are transformed into short self-report questionnaires. Both questionnaires correctly classify 81% of the patients. Therefore, they are, in spite of limitations, such as the inability to discriminate between different PDs, quite useful as quick screens for PDs.

All these instruments are based on the Diagnostic and Statistical Manual of Mental Disorders (DSM) (American Psychiatric Association, 2000) and the International Classification of Diseases and Related Health Problems (ICD) (World Health Organization, 1992). Consequently, they reflect the categorical approach. The criteria for diagnosing PD in DSM-5 and ICD-11, however, will almost certainly change dramatically (DSM-5, 2010). Besides the categorical approach, a dimensional component will be introduced. In view of the hypothesis that PDs are sharing the same dimensions as normal personality, just with extreme "values", it follows that one might identify PD using assessment instruments for basic personality dimensions.

One of the best known models for defining personality, using a dimensional approach, is the Big Five model (e.g. Costa & McCrae, 1992; Goldberg, 1990). This model is a general comprehensive framework for structuring individual differences. The five dimensions, which are seen as pervasive across cultures, reflect sociability (Extraversion), interpersonal interaction (Agreeableness), self-discipline and impulse control (Conscientiousness, describing task- and goal-directed behavior), personal adjustment (Neuroticism, contrasting emotional stability with anxiety, anger, and other negative feelings), and openness to new experiences (Openness, reflecting the breadth, depth, and complexity of mental and experiential life).

Costa and McCrea (1990) have suggested that the five-factor model of personality is highly relevant to the conceptualization and assessment of PDs. They have proposed to let the Big-Five model replace the categorical system for identifying PD in DSM-IV, because, in their view, the broad five supertrait dimensions offer adequate information to identify PDs that are traditionally diagnosed by categorical means. Several authors support these claims (Wiggins & Pincus, 1989; Costa & Mc Crae, 1992). Widiger, Costa, & McCrae (2002) have described how PD can be understood in terms of the Big-Five dimensions. They also present a four-step process that shows how the 12 PDs of the DSM-IV could be diagnosed using the five-factor model. The first step consists of formulating patterns of Big Five extremes that correspond to particular PDs. This should be based on a thorough understanding and a systematic conceptualization of how the five factors are defined in terms of content. Good examples of this first step can be found in the NEO-PI-R, which includes additional facet scores for each domain (Costa & McCrae, 1992), and in the review of Digman (1990).

Costa and McCrae (1990) give an excellent overview of each domain along with their characteristic trait-descriptive terms (adjectives) and corresponding facet scores as used in the NEO-PI-R. The facet scores combined with the descriptions of the domains give a good idea not only of all what is encompassed by a certain domain, but also which PD should correlate substantially with extremely high or low scores on these domains.

To present an overview of the 12 PDs in DSM-IV and their corresponding five-factor profiles for quick and easy use in a clinical setting, a reference sheet was compiled on the basis of the information gathered by Rottman, Ahn, Sanislow, and Kim (2009) and Shedler and Westen (2004), taking into account the correlations computed by Trull (1992) between NEO-PI scores and scores on the PDQ-R, a scale with high sensitivity and moderate specificity for most axis-II disorders (Hyler, Skodol, Oldham, Kellman, & Doidge, 1992), and the MMPI-Personality Disorder scales (Morey, Waugh, & Blashfield, 1985), as well as the meta-analytic study of Samuel and Widiger (2008) (See **Table 1**).

The Revised NEO Personality Inventory (NEO-PI-R) (Costa & McCrea, 1992) contains 240 items and takes approximately 40 minutes to complete. The NEO-FFI (Dutch version by Hoekstra, Ormel, & De Fruyt, 2003) is grounded on the same theoretical foundations as the NEO-PI-R but has only 60 items. Because it has less items the latter scale provides more general information at the domain level, not at the level of more specific facets. Taking into account that the NEO-PI-R is conceived of as a potential framework to assess PD, the NEO-FFI might be a screener for PD.

The research hypothesis and focus of this article is that extreme scores on the NEO-FFI, alone or in combination with a categorical screening instrument like the SAPAS-SR, is a good screener in an outpatient psychiatric population.

Table 1.
Five-factor model profiles and DSM-IV personality disorders.

DSM-IV Personality disorder	N	E	O	A	C
Paranoid	H			L	
Schizotypal	H	L		L	
Schizoid		L			
Histrionic		H			
Narcissistic				L	
Borderline	H			L	L
Antisocial				L	L
Avoidant	H	L			
Dependent	H				
Obs.-Comp.					H
Passive-Agrr.	H			L	L
Depressive	H	L			

Note: H = extreme score in the direction of the given Big Five dimension, L = extreme score opposite to the direction of the given Big Five dimension. N: Neuroticism; E: Extraversion; O: Openness ; A: Agreeableness; C: Conscientiousness.

Methods

Study Sample

The subjects for the present study were all patients referred to GGZ Midden-Brabant, a Community Mental Health Centre in Tilburg, The Netherlands. The study was approved by the Regional Medical Ethical Committee. From a total of 2116 patients that were referred to this institute between March 2004 and March 2005, 207 patients were recruited at random. The process of randomization contained one daily blind draw out of the full set of referrals. This was executed by the secretary of the intake desk. After drawing, inclusion and exclusion criteria were checked and in case of eligibility the invitation letter was sent. In case of non-eligibility, there was no second draw that day.

The criteria for recruitment were: Dutch origin and being non-illiterate. All recruited patients gave informed consent prior to participation. From the 207 patients recruited, 12 patients had to be excluded because they did not, after the first session, complete subsequent assessments, resulting in a study sample of 195 patients. Hundred-and-twelve individuals were female (57.4%), while 83 were male (42.6%). The mean age in the total group was 32.7 years (SD = 8.9). The primary reasons for psychiatric referral were: anxiety problems (n = 62; 31.8%), affective problems (n = 29; 14.9%), conduct disorders (n = 33; 16.9%), partner-relational problems (n = 23; 11.8%), somatic problems (n = 12; 6.2%), labour or school problems (n = 10; 5.1%), identity problems (n = 7; 3.6%), social problems (n = 4; 2.1%), addiction problems (n = 1; .5%), and cognitive problems (n = 2; 1.0%). No specific psychiatric problem was mentioned by the referring physician in the case of five patients (2.5%).

Measures

The NEO Five-Factor Inventory (NEO-FFI)

Because of its brevity, comprehensiveness, and ease of administration, the 60-item NEO Five-Factor Inventory (NEO-FFI) was employed. In contrast to its "big brother", the NEO-PI-R, calculation of facet scores is not possible. Subsequently, the focus lies on the broad domains: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. Each of these five domains is represented by 12 items that must be scored on 5-point Likert scales. Consequently, scores range from 12 to 60. The NEO-FFI has good psychometric properties (Costa & McCrae, 1992).

Since the present study compares the dimensional five-factor model of personality, used in the NEO-FFI, with the categorical approach of identifying PD, as used in the DSM-IV, scores on the Big Five were transformed into dichotomous scores reflecting extreme scoring. As threshold levels the upper and lower bound 10% of all observed scores within the dataset were used [1 = score in the lowest (0% - 10%) or highest (90% - 100%) decile; 0 = score in the deciles in between]. This method not only yielded a categorical score for each Big Five domain, but also a total score for extremity of rating made up of the number of Big Five domains with a score in the lowest (0% - 10%) or highest (90% - 100%) decile.

The Structured Clinical Interview for DSM-IV-TR Personality Disorders (SCID-II)

The SCID-II (First, Spitzer, Gibbon, & Williams, 1995) (Dutch version by Weertman, Arntz, & Kerkhof, 1997) is a semi-structured interview for diagnosing DSM-IV personality disorders. Translated into many different languages and used in clinical as well as research settings all over the world, it was chosen as the gold standard in the present study. The SCID-II consists of two parts. The first part contains eight open questions which address broad general behavior interpersonal relationships, and introspective ability of the patient. The second part holds 140 items divided into 12 sections, according to the PDs listed in the DSM-IV including the Depressive Personality Disorder and the Passive-Aggressive Personality Disorder (American Psychiatric Association, 2000). The content of each question bears a strong resemblance to every criterion as it is listed as typical and/or necessary for a specific PD within the DSM-IV. Items are scored as follows: ? (inadequate), 1 (absent), 2 (sub-threshold), or 3 (threshold). Interviewers need prior formal training in using the SCID-II and a quite profound knowledge of psychopathology as a whole, since clinical judgment plays an essential role in translating the wide range of possible patient reactions to each question into one of the response choices. The SCID-II is primarily designed to make a categorical diagnosis of PD. The interrater reliability and internal consistency of the SCID-II are adequate (Maffei, Fossati, Agostini, Barraco, Bagnato, Deborah et al., 1997; Westen & Shelder, 1999; Westen & Shelden 1999). The interrater reliability of the most recent Dutch version for the presence or absence of any PD is fair to good (Weertman, Arntz, Dreessen, Velzen, & Vertommen, 2003). Before undertaking fieldwork for the present study, the first author (S.G.) was formally trained in the use of the SCID-II.

The Self Report Standardized Assessment of Personality-Abbreviated Scale (SAPAS-SR)

The authors translated the items of the original SAPAS (Moran, Leese, Lee, Walters, Thornicroft, & Mann, 2003) and created a self-report questionnaire, the SAPAS-SR (Germans, Van Heck, Moran, & Hodiamont, 2010). The SAPAS was originally developed by Moran et al. (2003) as a structured interview with eight dichotomous items. The original instrument was validated in a sample of clinical and polyclinical patients. The alpha coefficient for the total score of the SAPAS was .68. A cut-off score of 3 correctly classified over 80% of the patients with a sensitivity of .94 and a specificity of .85 (Moran, Leese, Lee, Walters, Thornicroft, & Mann, 2003). The 8-item SAPAS-SR is an instrument that measures three broader domains, approximately reflecting the clusters A, B, and C as distinguished in the DSM-IV. Psychometric properties were studied, showing a test-retest coefficient of .89 for the total score. Factor analysis revealed that the three domains accounted for 53.8% of the total variance. When using a cut-off score of 4, the SAPAS-SR correctly classified 81% of the patients, while showing a sensitivity of .83 and a specificity of .80, which is only slightly lower than the results obtained with the original English interview version (Germans, Van Heck, Moran, & Hodiamont, 2010).

Procedure

The NEO-FFI and the SAPAS-SR were completed during the initial clinical appointment. The SCID-II interview took place one week after the initial clinical appointment. The first author (S.G.) was blind for the NEO-FFI and SAPAS-SR results prior to the SCID-II interview session.

Statistical Analyses

All statistical analyses were performed using the SPSS 17 for Windows package. First, all personality domain scores were transformed into dichotomous scores (extremity of rating versus no extremity of rating) that contrasted the top 10% and the bottom 10% scores, on the one hand, with the scores reflecting the less extreme range (11% - 89%), on the other hand. Then, scores on a new variable, Extremity of Rating (EoR0vs12345), were calculated: 0 (no extremity of rating on any of the five basic personality domains) versus 1 (extremity of rating on one or more traits). Subsequently, another dichotomous variable was created, reflecting the positive (1) or negative (0) outcome of the PD SCID-II diagnosis. Subsequently, Chi-square tests were performed.

As a next step in the analysis, a set of new dichotomous variables was calculated, contrasting 1) EoR01vs2345; extremity of rating on 0 traits or 1 trait versus extremity of rating on 2 or more traits; 2) EoR012vs345; extremity of rating on 2 or less than 2 traits versus extremity of rating on 3 or more traits; and 3) EoR0123vs45; extremity of rating on 3 or less than 3 traits versus extremity of rating on 4 or 5 traits. Three Chi-square tests were employed in order to examine whether different levels of extremity of rating were linked to caseness (i.e., any PD) in terms of SCID-II diagnosis (yes/no). Thereafter, for each participant the number of five-factor domains with extreme scoring was calculated. No participant had extreme scores on all five basic personality traits. This yielded a range of 1 (no extremity of rating) to 4 (extremity of rating on four traits). Additionally, a Pearson correlation coefficient was calculated to examine a possible relationship between the number of extreme five-factor scores and the number of PDs as diagnosed by the SCID-II interview.

Finally, dichotomous variables were created to distinguish participants who did not have a particular profile as described in **Table 1** (score = 0) and participants who actually did (score = 1).

Again Chi-square analyses were used to test the associations between the 12 dichotomous variables [e.g., Paranoid Big-Five Profile (yes/no), Schizotypal Big-Five profile (yes/no), Schizoid Big-Five profile (yes/no), etc.) and the PD diagnoses, according to the SCID-II. Then, we compared the NEO-FFI with the SAPAS-SR. A dichotomous variable, using the SAPAS-SR cut-off score of 4 (Germans, Van Heck, Moran & Hodiamont, 2008) was compared with (EoR0vs12345). For a final analysis, a variable was examined that combined (EoR0vs12345) with a positive screening result on the SAPAS-SR. This composite score was compared with the SCID-II diagnosis of any PD (yes/no PD). Hereafter, correlation analyses and regression analyses were performed to examine the associations between personality traits and PD.

Results

According to the SCID-II, at least one PD was present in 97 (50%) of the 195 patients. The mean number of PDs in patients diagnosed with any PD was 1.8 (SD = .87). The overall total number of SCID-II diagnoses was 172. The highest scoring personality factors of the study sample were Neuroticism and Agreeableness and the lowest scoring was Extraversion (see **Table 2**).

A Chi-square test, examining the relation between Extremity of Rating on one or more basic personality traits, on the one hand, (yes/no) and a PD diagnosis, according to the SCID-II (yes/no), on the other hand, revealed no significant relationship ($\chi^2(1, N = 195) = .072$, $p = .79$).

Among all 195 participants, there were 70 patients (35.9%) that showed no extreme score on any of the five-factor domains. Seventy-eight patients (40%) showed an extreme score on one of the domains, 31 (15.9%) on two domains, 14 (7.2%) on three domains, and two patients (1%) on four domains. Chi-square analyses, scrutinizing the relationships between the dichotomous variables EoR01vs2345, EoR012vs345, and EoR0123vs45 and caseness, according to SCID-II, did not result in significant associations ($\chi^2(1, N = 195) = .942$, $p = .33$; $\chi^2(1, N = 195) = .172$, $p = .68$; $\chi^2(1, N = 195) = .001$, $p = .97$).

The correlation between the number of five-factor extremes and the number of PDs, identified with the use of SCID-II was non-significant and very weak, $r = -.05$, $p = .47$.

For all participants with a specific PD, according to the SCID-II interview, it was examined whether or not they had the specific NEO-FFI profile as specified in **Table 1**. For instance, it was found that none of the 44 patients with a Borderline PD scored on the NEO-FFI the specific profile for Borderline syndrome (high on Neuroticism, low on Agreeableness and Conscientiousness) (see **Table 3**).

In addition, values for sensitivity, specificity, and correctly classified cases were calculated. **Table 4** gives an overview.

Twelve Chi-square tests comparing SCID-II diagnoses with the presence or absence of a particular Big-Five profile were performed. The majority of these analyses failed to find significant associations. Exceptions were the analyses for the schizotypal PD profile, $c^2(1, N = 195) = 96.99$, $p < .001$, and the schizoid PD profile, $c^2(1, N = 195) = 12.06$, $p = .001$.

The Chi-square test comparing the presence or absence of Extremity of Rating on at least one five-factor domain, on the one hand, with a positive or negative screening result on the SAPAS-SR, on the other hand, did not provide empirical support for a significant relationship ($\chi^2(1, N = 195) = .072$, $p = .79$.

A final analysis, combining SAPAS-SR and Big-Five profile information, both resulted in a significant relation between this composed score and the gold standard: $c^2(1, N = 195) = 34.52$,

Table 2.
Dimensional scores for the five NEO-FFI personality factors.

Factor	Minimum score	Maximum score	Median	Mean	SD
Neuroticism	16	58	45.0	43.7	8.3
Extraversion	16	57	35.0	35.1	8.2
Openness	22	54	36.0	36.7	6.7
Agreeableness	26	58	42.0	41.3	5.9
Conscientiousness	22	53	39.5	38.8	6.3

Table 3.
Number of patients with one or more PDs, according to the SCID-II and the NEO-FFI.

Personality disorder	SCID-II	NEO-FFI	
	N	Hit N	No-Hit N
Cluster A			
Paranoid	6	0	6
Schizotypal	1	1	0
Schizoid	1	1	0
Total cluster A	8	2	6
Cluster B			
Histrionic	4	1	3
Narcissistic	5	1	4
Borderline	44	0	44
Antisocial	19	0	19
Total cluster B	72	2	70
Cluster C			
Avoidant	27	2	25
Dependent	14	3	11
Obs.-Comp.	21	4	17
Total cluster C	62	9	53
N.A.O.			
Passiv-Agr.	9	0	9
Depressive	10	1	9
Total N.A.O.	19	1	18
Overall total	161	14	147

Note: N = number of patients. Hit = true positive; No-Hit = false negative. If a patient meets the SCID-II criteria for more than one personality disorder, then he/she is listed for all diagnosed PDs.

Table 4.
Sensitivity, specificity and the power to predict specific PDs with the NEO-FFI.

Personality disorder	Sensitivity	Specificity	PPV	NPV	Correctly classified (%)
Paranoid	.00	.98	.00	.97	.95
Schizotypal	1.00	.99	.50	1.00	.99
Schizoid	1.00	.93	.07	1.00	.93
Histrionic	.25	.88	.04	.98	.87
Narcissistic	.20	.92	.06	.98	.90
Borderline	0,00	0,99	.00	.77	.77
Antisocial	.00	.99	.00	.90	.90
Avoidant	.06	.98	.33	.87	.85
Dependent	.21	.87	.12	.93	.83
Obs.-Comp.	.19	.90	.20	.90	.83
Passiv-Aggr.	.00	.99	.00	.95	.95
Depressive	.10	.97	.17	.95	.93
Any PD	.63	.35	.48	.50	.49

Note: PPV = positive predictive value, NPV = negative predictive value.

$p < .001$, revealing a sensitivity of .54, a specificity of .86, and a value of .70 for correctly classified cases.

The screening abilities of the NEO-FFI were disappointing when using the profiles in **Table 1**. Therefore, to examine the associations between the NEO-FFI domains and the DSM-IV-TR PD criteria correlation and regression analyses were performed. Correlational analyses of the NEOFFI domain scores and dimensional scores for DSM-IV-R PD show that all domains correlate with two or more PDs (see **Table 5**).

Agreeableness correlated negatively with six PDs, namely, Paranoid, Schizoid, Schizotypal, Antisocial, Borderline, and Histrionic PD. Neuroticism showed five positive significant correlations with Paranoid, Borderline, Avoidant, Passive-Aggressive and Depressive PD. The most statistically significant simple correlation involved Agreeableness.

Tables 6 and **7** provide the results from logistic and hierarchical regression analyses using the NEO-FFI domain scores as the predictor variables and the SCID-II diagnoses as the criterion variables. The domain scores are statistically significant predictors for each of the 12 PDs.

At the domain level the NEO-FFI was effective in predicting symptom counts associated with Depressive, Borderline, and Schizoid PD. The NEO-FFI was a poorer predictor of Obsessive-Compulsive PD.

The correlations analyses and the regression analyses show associations between the NEO-FFI and the DSM-VI-TR PD criteria, but not very strong ones; the R^2 coefficients were for all the PDs between .10 and .21, which means that between 10% and 21% of the variance was explained.

Discussion

The hypothesis that the NEO-FFI could fulfill an important role as a dimensional screener for PD did not find support. Convergence between the categorical SCID-II results and the NEO-FFI was poor. With the SCID-II as the gold standard, the NEO-FFI does not fare well as an adequate screener. Furthermore, the NEO-FFI did not outperform a short categorical screener like the SAPAS-SR. Moreover, no support could be found for our expectation that extreme scores on the NEO-FFI should add value to the screening capabilities of the SAPAS-SR. This is not surprising, considering the disappointing results of the usefulness of the NEO-FFI as a screening instrument for PDs. The fact that no significant relationships between the SAPAS-SR and the NEO-FFI screening results could be obtained adds to the already established validity of the SAPAS-SR as a useful screening instrument (Germans, Van Heck, Moran, & Hodiamont, 2008).

The present study has a few limitations. First, it is questionable whether the five-factor domains alone, as they are measured by the NEO-FFI, have sufficient power of discernment to screen for all the 12 PDs. Even though the five-factor model may be considered comprehensive, it is conceivable that the facet scores as originally measured by the NEO-PI-R, are necessary in order to provide important additional information.

Careful examination of the different facets of each of the five factors, reveals that certain incongruities become apparent that may be clinically important. For example, it seems necessary to differentiate between two highly extraverted individuals, where one scores highly on the facet of assertiveness and the other on positive emotions.

Also angry hostility and impulsivity seem out of place in some PDs that would clearly include a high score of neuroticism in a five-factor profile, because these two facets seem different from the facets of vulnerability and anxiousness, which are also part of the neuroticism domain. Widiger and Mullins (2003) indicate that, for instance, in case of the Borderline PD, with the exception of self-consciousness that all other facets of

Table 5.
Correlation analyses for DSM-IV personality disorders against NEO-FFI scores.

Personality disorder	N	E	O	A	C
Paranoid	.17*	−.22*	−.04	−.32**	−.08
Schizotypal	.13	−.26**	−.06	.17*	−.29**
Schizoid	.11	−.31**	−.05	.15*	−.29**
Histrionic	−.03	.27**	.16*	.16*	.08
Narcissistic	.08	.04	.19**	−.29**	.07
Borderline	.35**	−.07	−.01	−.32**	−.19**
Antisocial	.11	.01	.11	−.31**	−.20**
Avoidant	.28**	−.28**	−.04	.10	−.10
Dependent	.27**	−.08	−.08	.18*	.05
Obs.-Comp.	.03	−.08	.05	.08	.22**
Passiv-Agr.	.28**	−.05	.14	.02	.04
Depressive	.37**	−.26**	.00	.21**	−.08
Any PD	.31**	−.27**	.03	−.23**	−.27**

Note: *p < .05; **p < .01; ***p < .001; N: Neuroticism; E: Extraversion; O: Openness; A: Agreeableness; C: Conscientiousness.

Table 6.
Logistic regression predicting SCID-II personality disorder counts with NEO-FFI domain scores.

Personality disorder	N	E	O	A	C	R2
Paranoid				•		.24
Schizotypal						
Schizoid						
Histrionic						.31
Narcissistic				•	•	.29
Borderline	•				•	.19
Antisocial				•	•	.22
Avoidant		•		•		.22
Dependent						.10
Obs.-Comp.		•				.06
Passiv-Agr.	•		•			.26
Depressive		•				.27
Any PD	•			•		.23

Note: • = predictive domain; N: Neuroticism; E: Extraversion; O: Openness; A: Agreeableness; C: Conscientiousness.

Table 7.
Hierarchical regression predicting SCID-II personality disorder symptom counts with NEO-FFI domain scores.

Personality disorder	N	E	O	A	C	F(5, 189)	R2
Paranoid		•		•		6.45***	.15
Schizotypal		•		•	•	6.83***	.15
Schizoid	•	•			•	8.06***	.18
Histrionic		•		•		5.49***	.13
Narcissistic			•	•	•	6.86***	.16
Borderline	•	•		•		9.72***	.21
Antisocial				•	•	5.97***	.14
Avoidant	•	•		•		5.55***	.13
Dependent	•			•		6.13***	.14
Obs.-Comp.		•			•	4.01**	.10
Passiv-Agr.	•		•		•	6.66***	.15
Depressive	•			•		11.51***	.24

Note: *p < .05; **p < .01; ***p < .001; • = predictive domain; N: Neuroticism; E: Extraversion; O: Openness; A: Agreeableness; C: Conscientiousness.

neurotisme (anxiousness, angry hostility, depressives, impulsivity, and vulnerability) are relevant while, self-consciousness plays a major role in the Schizotypical PD.

Second, most of the literature reviewed did not include the Passive-Aggressive as well as the Depressive PD. This made it difficult to find an empirical base for defining these two PDs in terms of the five-factor model.

Third, the Schizoid PD deserves mentioning since it was a tough one to translate into a five-factor profile. According to the meta-analytic review mentioned above, only extremely low scores on Extraversion define the profile. Not surprisingly, the results indicate that the Schizoid PD is greatly over-screened when using that profile. Furthermore, it became obvious that the number of extreme score requirements in a five-factor profile greatly reduces the frequency with which that profile's PD is screened. Borderline PD is the perfect example here. It had the highest frequency, according to SCID-II diagnoses. In spite of this, none of the patients was correctly classified as Borderline PD, according to the five-factor profile.

Conclusion

Overall we concluded that the screening capacity of the NEO-FFI for personality disorders is poor using Big-Five profiles. This does not mean that there was no association between the NEO-FFI en the DSM-PDs, therefor future research has to focus on the instrument with more detailed information such as the NEO-PI-R.

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