Personality Inventory for DSM-5 Short Form (PID-5-SF): Reliability, factorial structure and relationship with functional impairment in dual diagnosis patients.

Carmen Díaz-Batanero[1], Juan Ramírez-López[2], Sara Domínguez-Salas[1], Fermín Fernández-Calderón[1], Óscar M.Lozano[1]

1. Department of Clinical and Experimental Psychology. University of Huelva
2. Servicio Provincial de Drogodependencias de Huelva

Author for correspondence:

Oscar M. Lozano Rojas

Department of Clinical and Experimental Psychology. Avda. de las Fuerzas Armadas s/n. 21071. Huelva (Spain)

Email: oscar.lozano@dpsi.uhu.es

Tfno: +34 959 218439

Funding

This study has been funded by the grant "Análisis de la intervención de los pacientes con patología dual: Estudio longitudinal sobre los factores que intervienen en la estabilidad psicopatológica y la calidad de vida" (PI-0287-2014) from the Fundación Progreso y Salud.

Acknowledgments

We are grateful to Dr. Fernando Gutiérrez (Hospital Clinic de Barcelona) for providing us data from the 220-item version of the PID-5 to compute the congruence coefficients with the 100-item version

Personality Inventory for DSM-5 Short Form (PID-5-SF): Reliability, factorial structure and relationship with functional impairment in dual diagnosis patients.

Abstract

Section III of the DSM-5 has generated a personality paradigm consisting of 25 personality facets identified in five domains. The developed assessment instrument PID-5 has showed good psychometric properties but the potential for certain improvements still remain. In this paper, a sample of 282 dual diagnosis patients is used to provide evidence of the psychometric properties of the PID-5 Short Form. The mean value of Cronbach's *alpha* coefficients reached $\alpha = .73$ on the facets and .84 for domains and test - retest values ranged between .57 - .83 for facets and .70 - .87 for the domains. CFAs conducted showed good fit on both models tested: the five correlated factor structure and hierarchical structure of personality traits. The WHODAS 2.0 domains of understanding and communicating, and participating in society, appear to show the strongest relationship with personality facets. In general, the PID-5 Short Form shows adequate psychometric properties for use in dual diagnosis patients.

In recent decades, various aspects of the diagnostic model of personality disorders included in the DSM-IV-TR have sparked controversy. High rates of comorbidity, the heterogeneity observed among patients with the same diagnosis, and poor grounding of the cut-off points for differential diagnosis have raised question about the adequacy of the current nosological system (Skodol, 2012; Widiger & Samuel, 2005; Widiger & Trull, 2007). There has also been criticism of the overuse of the "personality disorder not otherwise specified" category, which indicates the inadequate coverage of different personality disorders (Verheul & Widiger, 2004). Among the shortcomings of this system is diagnosis based on the notion that there exists some number of categorically-defined personality types (Morey, Benson, Busch and Skodol, 2015). To the contrary, however, available evidence suggests that personality traits vary along a continuum from normal to pathological (Markon, Krueger & Watson, 2005).

These observations are promoting a paradigm shift toward a dimensional definition of personality characteristics, which is captured by Section III of the DSM-5 (APA, 2014). In this section, the diagnosis of personality disorders focuses on two key elements: the assessment of functional impairment of personality (Criterion A) and the identification of pathological personality traits (Criterion B). This dimensional approach involves assessing degree of maladaptive functioning in 25 personality facets configured in five domains (Krueger, Derringer, Markon, Watson & Skodol, 2012; Krueger & Markon, 2014).

To implement application of this dimensional personality model in clinical research and practice, the working group that drafted the DSM-5 proposal developed as an assessment instrument the 220-item Personality Inventory for DSM-5 (PID-5) (Krueger, Derringer, Markon, Watson & Skodol, 2012). To select the items for this instrument, data sets of possible items were collected from three community samples. The most

informative items (as defined by the psychometric framework of Item Response Theory) with the largest factorial loading on the facets for which they had been written were selected. To date, the original instrument has been adapted for Spanish (Gutiérrez et al., 2017), German (Zimmermann et al., 2014), Dutch (Bastiaens et al., 2016), Danish (Bo, Bach, Mortensen & Simonsen, 2015), Italian (Fossati et al., 2013), Czech (Riegel et al., 2017) and French speaking populations (Combaluzier, Gouvernet, Menant & Rezrazi, 2016; Roskam et al., 2015).

Systematic review of the PID-5 led Al-Dajani, Gralnick & Bagby (2015) to conclude that this instrument shows generally adequate psychometric properties with respect to its internal consistency and reliability. With respect to its internal consistency, Cronbach's *alpha* values have been found to exceed .70 in most facets and domains (Anderson et al., 2015; De Fruyt et al., 2013; Fossati et. al, 2013; Gore & Widiger, 2013; Quilty, Ayearst, Chmielewski, Pollock, & Bagby, 2013; Samuel, Hopwood, Krueger, Thomas, & Ruggero, 2013; Thimm, Jordan, & Bach, 2016a; Thomas et al., 2013; Watson, Stasik, Ro, & Clark, 2013; Wright et al., 2012; Zimmerman et al., 2014). Test-retest reliability was reported as values exceeding .90 for the domains in an unpublished study by Dhillon & Bagby (2015) of 66 students. A recent study by Riegel et al. (2017) using the Czech version of the PID-5 reported retest correlations of .74 - .84 for the five domains in a sample of 33 patients. However, neither of these latter two studies explored the test-retest reliability of the 25 facets.

Regarding the structure of the PID-5, exploratory factor analyses have for the most part identified five factors (Anderson et al., 2013; Krueger et al., 2012; Griffin & Samuel, 2014; Quilty et al., 2013; Thomas, 2012; Wright et al., 2012; Wright & Simms, 2014). These findings point to a connection between the personality model proposed in the DSM-5 and the 5-factor personality model. This factor structure was confirmed in

confirmatory factor analyses reported by Fossati et al. (2013), Gore & Widiger (2013), and Bach, Sellbom & Simonsen (2017), in which each facet appeared linked to its appropriate domain, with medium to high correlations between domains.

In addition, several studies have explored the hierarchical structure of personality traits using PID-5 scales. A study by Wright et al. (2012) found a hierarchical structure with a primary factor considered to represent personality pathology and from which emerged internalizing and externalizing factors. The internalizing factor encompassed the Negative Affect and Detachment domains of the PID-5; the internalizing factor encompassed the Antagonism and Disinhibition domains; and the PID-5 Psychoticism domain merged separately. Gutiérrez et al. (2017) and Thimm, Jordan, and Bach (2016a) obtained similar results using the same method of analysis. Similar structures have been observed in other studies with other assessment instruments or analytical techniques (Bagby et al., 2014; De Clercq et al., 2014; Wright & Simms, 2014). This hierarchical structure, which has been widely examined in studies of mental disorders, can provide a useful framework for understand comorbidity (Krueger & Markon, 2014; Krueger, McGue, & Iacono, 2001).

With respect to the validity of the PID-5 in relation to other variables (AERA, APA, NCME, 2014), several studies have shown correlations of PID-5 scores with scores obtained with personality measures based on the 5-factor model (Gore & Widiger, 2013; Griffin & Samuel, 2014; Few et al., 2013; Quilty et al., 2013; Thomas et al., 2013; Zimmerman et al., 2014) and with other instruments that assess personality disorder according to the DSM-IV classification (Few et al., 2013; Fossati et al., 2013; Hopwood et al., 2013; Wright et al., 2015). However, few studies have examined relationships between the PID-5 scores and functional outcomes. From a clinical perspective, these PID-5 variables can provide useful information about a patient's

mental state and guide patient intervention (Al-Dajani et al, 2015; Hopwood & Sellbom, 2013). In this regard, PID-5 findings confirm that patients with borderline personality disorder are likely to experience marked functional impairment, particularly in the social domain (Javaras, Zanarini, Hudson, Greensfield, & Gunderson, 2017). A study by Wright et al. (2012) with 2,916 undergraduate students suggests that facets included in the Antagonism domain correlate highly with interpersonal impairment. Findings by Keeley et al. (2014), using WHODAS 2.0 with a sample of 989 college students and 91 patients recruited in mental illness services, suggest that dimensions related to interpersonal impairment are more likely to correlate with facets of the PID-5 when compared with the mobility and self-care subscales. However, these authors suggest that extreme scores in the facets are linked with functional impairment in other areas as well.

Although these results speak to the psychometric soundness of the PID-5, it is important to note certain limitations of this measure and possible ways of improving it. The main limitation of the available PID-5 data is the restriction of studies mainly to student and community samples (Anderson et al., 2013; Ashton et al., 2012; Bagby et al, 2014; De Fruyt et al., 2013; Dhillon & Bagby, 2015; Griffin & Samuel, 2014; Gore & Widiger, 2013; Hopwood et al., 2012; Samuel et al., 2013; Sellbom et al., 2013; Suzuki et al., 2015; Wright et al., 2012). Although using nonpatient samples in research on clinical assessment measures can provide valuable information, such restricted samples do not include participants who would be likely to show the upper levels of scores on facets of personality disorder (Al-Dajani, Gralnick, & Bagby, 2015).

Another limitation of the PID-5 is the time required to administer it. The 220-word length of the instrument can prove problematic in certain clinical or research evaluations settings in which numerous other measures must be administered as well (Mullins-Steweatt & Widiger, 2009). The PID-5 Brief Form was developed concurrently with the

original version by extracting key items from of each of the five domains (APA, 2013; unpublished data, available from Krueger et al., 2012). The few studies published thus far with the resulting 25-item version of the PID-5 show reliability, internal structure, and validity comparable to the findings of the original version (Anderson, Sellbom, & Salkin, 2016; Combaluzier, et al., 2016; Fossati et al., 2017). However, the items that comprise this brief version do not adequately represent the content of the 25 PID-5 facets. Specifically, the facets of restricted affectivity, rigid perfectionism, submissiveness, and suspiciousness are not represented, whereas the facets of withdrawal, impulsivity, eccentricity, and perceptual dysregulation are represented by two items each. This skewed representation would imply that the customary interpretation of this instrument should be based on the domains and not the facets.

Another short form version with 100 items, the PID-5-SF, has recently been published by Maples et al. (2015). This version was developed by applying Item Response Theory to the full-length 220-item version of the PID-5. The PID-5-SF consists of four items for each of the 25 facets, selected on the basis of their relatively high parameters of discrimination and test information. This 100-item version of the PID-5 has shown psychometric properties similar to those of the 220-item version (Bach, Maples, Bo, & Simonsen, 2016; Thimm, Jordan, & Bach 2016b). Considering its characteristics and administration time, it would appear to be the most efficient version of the PID-5. Beyond the studies cited, no others using this PID-5-SF version have been found.

In view of the psychometric studies conducted with the PID-5 and the need for additional psychometric information for the 100-item short form, the plan for the present study was to assess a sample of patients with dual diagnosis in order to (a) estimate the reliability of the PID-5-SF, as determined by the internal consistency and stability of its scores; (b) apply confirmatory models to provide evidence of both the

internal and hierarchical structure of the 5-factor model; and (c) examine the validity of the PID-5-SF by analysing its relationship with measures of functional impairment.

Method

Participants

The sample consisted of 282 dual diagnosis patients in treatment, recruited from eight outpatient drug treatment centers (85 patients), two therapeutic communities (50 patients), and five community mental health centers (78 patients) in the Spanish province of Huelva. All participants had been diagnosed by clinicians as dual diagnosis patients. The Mini International Neuropsychiatric Interview was used to standardize these diagnoses. The participant data were collected between November 2015 and June 2017. During this period, 19 patients who met the criteria to participate in the study declined to do so.

Men constituted 86.4% of the sample, which had a mean age of 39.8 years (SD = 10.76). With respect to their level of education, 18.8% of the participants had not completed basic education, 54.9% had reached primary education, 23.4% had reached secondary education, and 2.9% of the participants had reached higher education. With respect to employment, 8.4% of participants were working at the time of their interview. Regarding their condition, 45.1% of the sample were being treated for alcohol abuse, 44.5% for cannabis abuse, 64.2% for cocaine abuse, and 25.7% for heroin abuse. A substantial portion of the sample (66.4%) of the sample was being treated for use of more than one psychoactive substance. As for the co-occurring disorders, 54.6% of the participating patients had mood disorders, 64.2% had an anxiety disorder, 28.7% had a psychotic disorder, 2.5% had an eating disorder, and 22.3% were diagnosed with antisocial personality disorder.

Measures

Personality Inventory for DSM-5 Short Form. The 100-item version of the PID-5 was administered to all participants. This measure assesses all the 25 facets identified in the DSM-5. Each facet was assessed with four items using a Likert response format, with scores ranging from 0 ("Very false or often false") to 3 ("Very true or often true"). The adaptation developed by Gutiérrez et al. (2017) was used for translating the items into Spanish. The score for each facet was calculated by averaging the scores obtained on the four items related to that facet. Hence the higher these average scores, the greater the presence of the facet to which they relate. In keeping with the PID-5 instructions, scores for the domains were then calculated by averaging the scores obtained for the facets.

In order to check concordance between PID-5 and PID-5-SF scores, a Reduction in Uncertainty (RiU) index was computed. This index provides information about the statistical certainty of an observed relationship between a predictor variable and a dependent variable. According to Dorans and Walker (2007), $RiU = 1 - \sqrt{(1-r^2)}$, where r is the correlation coefficient between both test scores. When $r = 0$, there is a 0% reduction; when $r = 1$, there is 100% reduction. It is reasonable to expect that at least 50% of uncertainty reduction in one score has resulted from the other score. Correlation coefficients between the PID-5 and the PID-5-SF ranged from .85 (perceptual dysregulation) to .99 (submissiveness). The RiU index between both versions ranged between 52.68% and 95.52%, except for risk taking and perceptual dysregulation, which showed coefficients of 48.46% and 46.52%, respectively.

World Health Organization Functional Impairment Assessment Schedule (WHODAS 2.0; Üstün & Chatterji, 2010). WHODAS 2.0 is a 36-item instrument for assessing

functional impairment in the following areas: understanding and communicating, getting around, self-care, getting along with people, life activities, and participation in society. The total WHODAS 2.0 score is calculated by adding the scores for each area on a scale of 0-100. This scale was adapted for the Spanish-speaking population, and its psychometric properties have been examined in various population groups, including patients with psychiatric disorders (Federici, Meloni, & Presti, 2009). The total WHODAS 2.0 score is then transformed into an ordinal scale for measuring five degrees of functional impairment (WHO, 2001): little or no functional impairment (0% - 4%), mild impairment (5% - 24%), moderate impairment (25% - 49%), severe impairment (50% - 95%) and extreme impairment (96% - 100%). In the DSM-5, this scale is endorsed as a useful measure of disability associated mental disorders (APA, 2014).

Mini International Neuropsychiatric Interview (MINI: Sheehan et al., 1998). This interview is recommended by the Substance Abuse and Mental Health Service Administration (US) as an instrument of screening for people with substance abuse problems and comorbid psychiatric disorders in order to combine medical and psychiatric assessment (SAMHSA, 2005). The present study employed the Spanish version of the MINI (Ferrando, Bobes, Gibert, Soto & Soto, 2000), which assesses Axis I psychiatric disorders according to DSM-IV criteria.

Procedure

The measures were administered by a psychologist with experience in patient assessment between 15 and 20 days after the beginning of the patient´s treatment. The psychologist had previously received specific training in how to administer these tests. The interviews were conducted at the centers where the patients were being treated. At the beginning of the interview, the patients were informed by the psychologist about the

nature and objectives of the research being conducted and told them that the study findings would not be included in their treatment process, that the information collected would not be part of their medical record unless authorized them, that their participation was voluntary, and, if they wanted to participate, they would have to read and sign an informed consent form. Once the patient had signed, the interview was begun.

This study was approved by the ethics committee of the University of Huelva and the hospital to which the Mental Health Units belonged.

Analysis

Univariate and bivariate statistics were applied for the description of the sample. Reliability was calculated using two procedures: test-retest and internal consistency. Internal consistency was estimated using Cronbach's *alpha* coefficient. Mean inter-item correlations and item-scale correlations were also computed. The test-retest procedure was carried out in a sub-sample of 65 patients, applying the Pearson correlation coefficient to the scores obtained with a two-week interval. Differences in scores between two measures were analysed using Cohen's *d*.

Evidence of validity based on internal structure was analyzed with a confirmatory factor analysis (CFA). A preliminary examination of the data identified multivariate non-normality (Mardia's coefficient = 17.14; $p < .001$). Accordingly, the maximum likelihood estimator with robust standard errors was used to conduct the factor analyses. Three models were compared: Model 1 with five correlated factors; Model 2 with two second-order factors (externalizing and internalizing) and an overall higher order personality pathology factor; and Model 3 with two correlated second-order factors (externalizing and internalizing) and the Psychoticism domain correlated with these two factors. Several measures were used to identify model fit, including the $\chi 2$ goodness-of-

fit statistic, the root mean square error of approximation (RMSEA), and Bentler's (1990) comparative fit index (CFI) and non-normed fit index (NNFI). Following Hu and Bentler's (1999) suggestions, CFI and NNFI values ≥ .95 and RMSEA values close to .06 were considered indictors of good model fit.

In order to compare the factor structure of the Spanish PID-5-SF with the original PID-5 and original PID-5-SF, congruency coefficients (Lorenzo-Seva & Ten Berge, 2006) with the factor loadings obtained in the study by Krueger et al. (2012) and Maples et al. (2015) were computed. Exploratory factor analysis was conducted using principal axis factoring with equamax rotation, which was the same analysis as that used by Maples et al. (2015).

Validity evidence based on the relationship with functional outcomes was obtained by computing the correlations between the subscales of WHODAS 2.0 and the facets of PID-5-SF.

Results

Analysis of items and reliability of the PID-5-SF

Table 1 shows the descriptive statistics for the 25 facets, their discrimination index, and the internal consistency of the test. Cronbach's *alpha* coefficients of the facets range from α = .59 (irresponsibility) to α = .89 (intimacy avoidance), with a mean value of α = .73. Of the 25 facets, reliability values of less than α = .65 were observed in the scales of callousness, grandiosity, suspiciousness, and unusual beliefs and experiences. For the domains, the values ranged from α = .80 (Psychoticism) to α = .88 (Antagonism), with a mean value of α = .84. The mean item-scale correlation values were > .30 for all the facets, from r = .38 (unusual beliefs & experiences and grandiosity) to r = .76 (intimacy

avoidance). The inter-item correlations were > .30 for all facets except for grandiosity (*r* = .29), irresponsibility (*r* = .25) and suspiciousness (*r* = .29).

INSERT TABLE 1

The test-retest reliability results are presented in Table 2, including descriptive summaries of the subsample (*n* = 65) on both occasions of their assessment and effect sizes. Cohen's *d* values were < 0.30 on 20 facets, which can be interpreted as small according to standard rule-of-thumb for *d* (i.e., small < 0.2, medium = 0.5, and large > 0.8). Small to medium effect sizes were observed for anxiousness, depressivity, eccentricity, and perceptual dysregulation. Test-retest correlations for the facets showed values between *r* = .57 anxiousness) and *r* = .83 (withdrawal). For the domains, the correlation values between the test and retest were in the range of *r* = .70 to *r* = .87.

INSERT TABLE 2

Evidence of validity based on the internal structure of PID-5-SF

As a starting point, congruence coefficients of the factors of the PID-5-SF and the original PID-5 (Krueger et al., 2012) were computed. The factor congruence coefficients were .80 (Negative Affect), .85 (Detachment), .82 (Psychoticism), .87 (Antagonism), and .73 (Disinhibition), with a mean value of .81. Congruency coefficients with the loadings presented by Maples et al. (2015) with PID-5-SF were .95 (Negative Affect), .75 (Detachment), .88 (Psychoticism), .98 (Antagonism), and .88 (Disinhibition), with a mean value of .89.

The results of the confirmatory factor analysis showed a good fit with Model 1, in which the structure of five correlated factors is tested: (S-Bχ^2 (80) = 177.94; CFI = .920, NCFI = 0.901; AIC = 17.94; SRMR = .067; RMSEA = .066 [90% confidence interval = .05, .07]. The standardized factor loadings ranged from .41 (intimacy avoidance within

the Detachment domain) to .83 (anhedonia within Detachment). The values of covariance between factors ranged .03 -.79 (see Figure 1).

INSERT FIGURE 1 HERE

Following the CFA analysis, the intra-class correlation coefficients were calculated for each facet in order to determine the extent of systematic group-level variance among the different sampling groups used. The ICC values for all facets ranged from < .001 to .058 (Manipulativeness), with an average ICC of .017. Given the small ICC values of < .10 (Muthén & Asparouhov, 2011), it appears that there is insufficient between-group variation to warrant the use of multilevel analyses.

Hierarchical structure of personality traits

Two hierarchical models with second-order internalizing and externalizing factors were compared. Both models showed identification problems for the involved equations. According to Bollen (1989), in a second-order CFA the higher order factors must have at least three factors in the lower order. In this model, however, only two lower order factors appeared for each higher order factor. To address this problem of model identification, variances of error of the second-order factors were set so male them equal to one another. Once the identification problems had been resolved, Model 2, with an overall personality pathology factor, did not show a proper fit (S-Bχ^2 (80) = 194.40; CFI = .898, NCFI = .854; AIC = 34.40; SRMR = .076, RMSEA = .07 [90% confidence interval = .06, .09]). Finally, for Model 3, with two second-order factors correlated with the Psychoticism domain, the fit indices showed revealed that the proposed model was adequate (S-Bχ^2 (81) = 100.62; CFI = .984, NCFI = 0.925; AIC = 61.37; SRMR = .076; RMSEA = .02 [90% confidence interval=.01, .04]. The standardized factor loading ranged from .41 (intimacy avoidance within the Detachment domain) to .83

(anxiousness within the Negative Affect domain). Covariance values between second order factors and Psychoticism ranged from 89 to .91 (see Figure 2).

INSERT FIGURE 2 HERE

Evidence of validity based on relations with other variables

Table 3 shows the Spearman correlations between the facets of PID-5 and the subscales of the WHODAS 2.0. Some facets failed to show a correlation with any of the scales of the WHODAS 2.0, including: attention seeking, callousness, grandiosity, impulsivity, manipulativeness, restricted affectivity, and rigid perfectionism. On the other hand, the facets of anxiousness and depressivity did show significant correlations with all the scales of the WHODAS 2.0.

For the remaining facets, the WHODAS 2.0 understanding and communicating scale shows stronger correlations, with values between .30 (perceptual dysregulation) and .56 (distractibility). The participation in society scale shows moderate correlation values with the other facets, from .31 (unusual beliefs and experiences) to .55 (anxiousness). In addition, the WHODAS 2.0 getting along with people and life activities scales show some moderate correlations with certain facets (anhedonia: r = .36 and .38, respectively; eccentricity: r = .40 and .43; irresponsibility: r = .36 and .37).

INSERT TABLE 3 HERE

Discussion

This study intended to estimate the reliability and provide evidence of the validity of a 100-item short form version of the PID-5, the PID-5-SF. It is the first Spanish study of this version of the PID-5, and it is innovative in various ways compared to existing studies of it in the literature.

First, the present study was conducted with dual diagnosis patients, whereas the majority of PID-5-SF psychometric studies to date have used student and community samples (Anderson et al., 2013; Ashton et al., 2012; Bagby et al, 2014; De Fruyt et al., 2013; Dhilon & Bagby, 2015; Griffin & Samuel, 2014; Gore & Widiger, 2013; Hopwood et al., 2013; Samuel et al., 2013; Sellbom et al., 2013; Suzuki et al., 2015). There have been several studies of the PID-5-SF with clinical samples (Anderson et al., 2015; Bagby et al., 2014; Few et al., 2013; Quilty et al., 2013; Watson et al., 2013; Wright et al., 2012; Wright & Simms, 2014; Yam & Simms, 2014), but none has thus far focused specifically on patients with drug use disorders. The present psychometric findings with a drug use sample is of interest for two reasons.

First, drug use patients have high rates of psychiatric comorbidity (Weaver et al., 2003), and this instrument is likely to be widely used in the assessment of these dual diagnosis patients. Therefore, as recommended by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education (2014) for the use of instruments, it is important to muster evidence confirming the interpretation of PID-5-SF scores obtained from these patients. Second, it is common in these patients to find that symptoms resulting from intoxication and withdrawal can mimic the symptoms of other mental disorders (Quello, Brady, & Sonne, 2005), and it is therefore important to provide psychometric evidence that relates to this fact. To this end, the present study included estimates of test-retest reliability to determine the stability of the obtained scores.

From the viewpoint of reliability and internal consistency, according to Nunnally and Bernstein (1994), Cronbach's *alpha* coefficients above .70 are considered adequate. This value is exceeded for 14 of the 25 facets. However, the number of items in this short form (4 per facet) warrants some moderation in the values of internal consistency, and

21 of the facets show an internal consistence of *alpha* > .65. Maples et al. (2015) did not report the *alpha* values for each facet, but did report a .67 to .91 range, which is similar to the findings in the present study. Consistently with the present findings, Thimm, Jordan, and Bach (2016b) found in a student sample *alpha* values > .70 for all facets except suspiciousness and perceptual dysregulation. In other studies conducted with the 220-item version, lower internal consistency values have also been found for the facets of grandiosity (Strickland et al., 2013; Thimm, Jordan, & Bach, 2016a), suspiciousness (Anderson, 2013; Griffin & Samuel, 2014; Thimm, Jordan, & Bach, 2016a), and irresponsibility (Bach et al., 2016; De Clercq et al., 2014; Keeley et al., 2014; Sellbom et al., 2013; Van den Broeck, Bastiaansen, Rossi, Dierckx, & De Clercq, 2013; Van den Broeck et al., 2014). It should be noted that lower and unexpected internal consistency values were found for the facet of unusual beliefs & experiences. This result may be due to item 150, which is "Sometimes I can influence other people just by sending my thoughts to them". The lower corrected item-scale correlation value found on this item (*r* =. 27) may indicate a need to review the wording of the item.

With respect to test-retest reliability, previous literature has reported retest correlations for domains (Dhillon & Bagby, 2015; Riegel et al., 2017). The present 2-week retest findings for the 25 facets is thus a significant contribution to the literature. Wright et al. (2015) explored the stability of personality traits over a period of 1.44 years and observed small effect sizes for all of the traits (except submissiveness, restricted affectivity, withdrawal, irresponsibility, rigid perfectionism, and risk taking). The effect sizes observed for these facets in the present sample were < .20, which provides support for the stability of the measure. Such adequate reliability indicates that the statements of items may be effectively measuring a construct as a "trait". However, the low reliability observed in facets such as anxiousness and distractibility suggests that some statements

may be understood as a specific “state” of patients at the time of their assessment. As has been noted, the facets of anxiousness, depressivity, and perceptual dysregulation have shown lower retest reliability values and a moderate effect size.

One possible explanation for this result might be that the acute effects of substance use or withdrawal may cause such psychiatric symptoms of anxiety or dysphoria (Brady & Sinha, 2005; Quello, Brady, & Sonne, 2005). Also to bear in mind is the timing of the test-retest assessment, with the testing conducted 15-20 days after the start of the treatment and the retest 2 weeks later. Having begun their treatment, a majority of the patients are likely to have stopped using substances. It is possible that during this period of time until the first assessment, while clinical professionals are to stabilize the patients by adjusting drug doses, some withdrawal symptoms provoke anxiety, depression, or sensorial alteration symptoms (APA, 2013). During the retest, after at least one month of treatment, the patient´s symptoms are likely to have become more stabilized. This could explain why the scores for these facets are higher on the test than on the re-test, and hence why such an effect size was observed. Thus, it should be considered that PID-5-SF can be trait-like in this population for some, but not for all, of its facets. In terms of clinical administration, it would be advisable to administer the PID-5-SF to such dual diagnosis patients after the acute effects of stopping drug use have passed. Further research is needed to test this possibility.

With respect to its internal structure, the CFA confirms the structure of the five correlated factors that had previously emerged in the exploratory factor analysis of the original PID-5 (Anderson et al., 2013; Fossati et al., 2013; Krueger et al., 2012; Griffin & Samuel, 2014; Quilty et al., 2013; Thomas, 2013; Wright et al., 2012; Wright & Simms, 2014). However, no previous studies have analysed this structure in samples of patients with drug use disorders. Hence the CFA with the present sample provides

additional evidence concerning on the factorial structure of personality domains in clinical samples with high comorbidity. The present also concur with findings obtained with the original version of the PID-5 and support the relationship between the scores on this instrument and the five-factor personality models.

The obtained index of factorial congruence demonstrates the comparability of the Spanish version of the PID-5-SF and both the version developed by Maples et al. (2015) and the original version of PID-5 developed by Krueger at al. (2012). Factorial congruence values ranged from .73 (Disinhibition) to .87 (Antagonism). Congruency coefficients with the loadings presented by Maples et al. (2015) ranged from .78 (Detachment) to .98 (Antagonism). Congruence coefficients in the range of .85-.94 indicate fair similarity, and factors can be assumed equivalent when the values exceed .95 (Lorenzo-Seva & Ten Berge 2006). The present finding that the domains of Disinhibition and Detachment have relatively low congruence values is consistent with previous reports (Thimm, Jordan, & Bach, 2016b).

Of further note, the present study also compared the hierarchical structure established by the two second-order factors of internalizing and externalizing. The internalising factor represents the propensity to experience states of unipolar mood and anxiety disorders, which appear to be linked to the dimensions of Negative Affect and Detachment. The externalizing factor dimension represents the propensity to experience disinhibitory disorders (Clark, 2005; Krueger & Markon 2006), which appear to be linked to the domains of Disinhibition and Antagonism. Several previous studies have analyzed this structure (De Clercq et al., 2014; Morey et al., 2013; Thimm, Jordan, & Bach, 2016a; Van der Broeck et al., 2014). In this regard, the findings in the present study support the relationship of the PID-5SF scores with personality models that focus

on higher levels of the hierarchy and thus provide a general framework for personality functioning and psychopathological disorders (Krueger & Markon, 2006).

A further highlight of the present study is the evidence of relationships between the PID-5-SF scores and the WHODAS 2.0 indicators of the functionality of these dual diagnosis patients. For these types of patients, both substance consumption and personality disorders have an impact on outcomes related to the psychosocial state of the patients and their quality of life (Lozano, Rojas & Fernández-Calderón, 2017; Vélez-Moreno et al., 2016). However, to date, the relationship between functional malfunction and personality facets has not yet been deeply analyzed. In this regard, the present provides new evidence that some of the facets relate more strongly than others with several domains of the functional state of the patients. Specifically, the facets of personality are most directly related to the dimensions of understanding and communicating and participation in society. These results are partially consistent with those reported by Keeley et al. (2014) with a clinical sample. Keeley et al. found the facets to be most closely related to the domains of understanding and communicating, getting along with people, and participation in society. Similarly, with a sample of undergraduates, Wright et al. (2012) found that the personality traits identified in the DSM-5 are related primarily to interpersonal impairment. Similarly, in the present sample of patients with dual diagnosis, it is also noted that the facet scores of the PID-5-SF are related mainly to aspects of the interpersonal relationships of these patients, which constitutes validity evidence consistent with that shown by other authors.

Although this study presents novel and interesting results from a psychometric and clinical perspective with the PID-5 in its 100-item version, it is not without limitations. One of these limitations concerns the possibility that functioning might not be adequately assessed in this type of dual diagnosis patients when using self-report as the

only test measure. The functioning associated with such facets such as grandiosity or callousness might better be assessed by complementing self-report measures with other sources of information, such as family members' reports or register data. Optimal use of multi-source data could improves prediction of behavior in the clinical assessment of psychopathology (Ready, Watson & Clark, 2002).

A second limitation may be the sample size. The study was conducted with a sample of 282 patients, whereas previous PID-5 psychometric studies have been carried out with larger samples. However, the majority of these other studies were conducted on non-clinical samples. To date, studies conducted on clinical samples with the PID-5 have had sample sizes between 91 (Keeley, Flanagan & McCluskey, 2014) and 628 (Wright & Simms, 2014) patients. In only four studies has the sample size been greater than the one used in the present study (Anderson et al., 2015; Bagby, Sellbom, et al., 2014; Wright & Simms, 2014; Yam & Simms 2014). Despite this limitation, the present authors believe that their sample size was sufficient for successful implementation of the statistical analyses conducted. Increasing the sample size might have improved the estimated reliability of the scores, by increasing their variability (Streiner, 2003). On the other hand, it should be noted that the participants were located in several treatment centers, thereby increasing the representativeness of the sample's clinical profile. Therefore, although future studies with larger sample sizes might strengthen the psychometric foundations of this instrument, the present authors believe that the results obtained here support the use of the PID-5 in its 100-item version in evaluating patients with this profile.

References

Al-Dajani, N., Gralnick, T. M., & Bagby, R. M. (2015). A psychometric review of the personality inventory for DSM-5 (PID-5): Current status and future directions. *Journal of personality assessment.* doi: 10.1080/00223891.2015.110757.

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1999). *Standards for educational and psychological testing.* American Educational Research Association.

American Psychiatric Association (APA) (2014). *Manual diagnóstico y estadístico de los trastornos mentales DSM-5*. [Diagnostic and statistical manual of mental disorders (5th Edition)] Madrid: Panamericana.

Anderson, J. L., Sellbom, M., Ayearst, L., Quilty, L. C., Chmielewski, M., & Bagby, R. M. (2015). Associations between DSM–5 Section III personality traits and the Minnesota Multiphasic Personality Inventory–2– Restructured Form (MMPI–2–RF) scales in a psychiatric patient sample. *Psychological Assessment, 27*, 801–815. doi: 10.1037/pas0000096.

Anderson, J. L., Sellbom, M., Bagby, R. M., Quilty, L. C., Veltri, C. O., Markon, K. E., & Krueger, R. F. (2013). On the convergence between PSY-5 domains and PID-5 domains and facets implications for assessment of DSM-5 personality traits. *Assessment, 20*(3), 286-294.

Anderson, J. L., Sellbom, M., & Salekin, R. (2016). Utility of the personality inventory for DSM-5 brief form (PID-5-BF) in the measurement of maladaptative personality and psychopathology. *Assessment, 29,* 1-12. doi: 10.1177/1073191116676889.

Ashton, M. C., Lee, K., de Vries, R. E., Hendrickse, J., & Born, M. P. (2012). The maladaptive personality traits of the Personality Inventory for DSM-5 (PID-5) in

relation to the HEXACO personality factors and schizotypy/dissociation. *Journal of Personality Disorders, 26*(5), 641.

Bastiaens, T., Claes, L., Smits, D., De Clercq, B., De Fruyt, F., Rossi, G., . . . DeHert, M. (2015). The construct validity of the Dutch Personality Inventory for DSM–5 Personality Disorders (PID-5) in a clinical sample. *Assessment, 23*(1), 42-51. doi: 10.1177/ 107319111557506.

Bach, B., Maples, J., Bo, S., &, Simonsen, E. (2016). The alternative DSM-5 personality disorder traits criterion: A comparative examination of the three self-report forms in a danish population. *Personality disorders: Theory, research, and treatment,* 2, 124-135. doi: 10.1037/per0000162.

Bach, B., Sellbom, M., Simonsen, E. (2017). Personality inventory for DSM-5 (PID-5) in clinical versus nonclinical individuals: Generalizability of psychometric features. *Asessment,* 1-11. doi: 10.1177/1073191117709070.

Bagby, R. M., Sellbom, M., Ayearst, L. E., Chmielewski, M. S., Anderson, J. L., & Quilty, L. C. (2014). Exploring the hierarchical structure of the MMPI–2–RF personality psychopathology five in psychiatric patient and university student samples. *Journal of personality assessment*, *96*(2), 166-172. doi: 10.1080/00223891.2013.825623.

Brady, K. T., & Sinha, R. (2005). Co-occurring mental and substance use disorders: the neurobiological effects of chronic stress. *American Journal of Psychiatry*, *162*(8), 1483-1493.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological bulletin*, *107*(2), 238.

Bo, S., Bach, B., Mortensen, E. L., & Simonsen, E. (2015). Reliability and hierarchical structure of DSM–5 pathological traits in a Danish mixed sample. *Journal of*

Personality Disorders. Advance online publication. doi: 10.1521/pedi_2015_29_187.

Clark L. A. (2005). Temperament as a unifying basis for personality and psychopathology. *Journal of Abnormal Psychology. 114*(4), 505–21.

Combaluzier, S., Gouvernet, B., Menant, F., & Rezrazi, A. (2016). Validation d'une version française de la forme brève de l'inventaire des troubles de la personnalité pour le DSM-5 (PID-5 BF) de Krueger. *L'Encéphale.* doi: 10.1016/j.encep.2016.07.006.

De Clercq, B., De Fruyt, F., De Bolle, M., Van Hiel, A., Markon, K. E., & Krueger, R. F. (2014). The hierarchical structure and construct validity of the PID-5 trait measure in adolescence. *Journal of Personality*, *82*(2), 158-169. doi: 10.1111/jopy.12042.

De Fruyt, F., De Clercq, B., De Bolle, M., Wille, B., Markon, K., & Krueger, R. F. (2013). General and maladaptive traits in a five-factor framework for DSM–5 in a university student sample. *Assessment, 20*, 295–307. doi: 10.1177/1073191113475808.

Dhillon, S., & Bagby, R. M. (2015). The internal and one-week retest reliability of the PID–5 domains and facets. Unpublished manuscript, Department of Psychology, University of Toronto Scarborough, Toronto, Canada.

Dorans, N.J., & Walker, M.E. (2007). Sizing up linkages. In Dorans, N.J., Pommerich, M., Holland, P.W., (Eds). *Linking and Aligning Scores and Scales*. New York: Springer. p. 179–98.

Ferrando, L., Bobes, J., Gibert, J., Soto, M., & Soto, O. (2000). *MINI Entrevista Neuropsiquiátrica Internacional.* Madrid: Instituto IAP.

Few, L. R., Miller, J. D., Rothbaum, A. O., Meller, S., Maples, J., Terry, D. P., ... & MacKillop, J. (2013). Examination of the Section III DSM-5 diagnostic system for

personality disorders in an outpatient clinical sample. *Journal of abnormal psychology, 122*(4), 1057. doi: 10.1037/a0034878.

Fossati, A., Krueger, R. F., Markon, K. E., Borroni, S., & Maffei, C. (2013). Reliability and validity of the personality inventory for DSM–5 (PID-5): Predicting DSM–IV personality disorders and psychopathy in community-dwelling Italian adults. *Assessment, 20,* 689–708. doi: 10.1177/1073191113504984.

Fossati, A., Somma, A., Borroni, S., Markon, K. E., & Krueger, R. F. (2017). The Personality Inventory for DSM-5 Brief Form: Evidence for Reliability and construct validity in a sample of community-dwelling Italian adolescents. *Assessment, 24* (6), 615-631. doi: 10.7319/1115621793.

Gore, W. L., & Widiger, T. A. (2013). The DSM-5 dimensional trait model and five-factor models of general personality. *Journal of abnormal psychology, 122* (3), 816 – 821. doi: 10.1037./a0032822.

Griffin, S. A., & Samuel, D. B. (2014). A closer look at the lower-order structure of the Personality Inventory for DSM-5: Comparison with the Five-Factor Model. *Personality Disorders: Theory, Research, and Treatment, 5*(4), 406. doi: 10.1037/per0000074.

Gutiérrez, F., Aluja, A., Peri, J. M., Calvo, N., Ferrer, M., Baillés, E. … (2017). Psychometric properties of the Spanish PID-D in a clinical and a community sample. *Assessment, 24* (3), 326 - 336. doi: 10.1177/1073191115606518.

Hopwood, C. J., Wright, A. G., Krueger, R. F., Schade, N., Markon, K. E., & Morey, L. C. (2013). DSM-5 pathological personality traits and the personality assessment inventory. *Assessment, 20*(3), 269 – 285. doi: 10.1177/1073191113486286.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *6*(1), 1-55.

Javaras, K. N., Zanarini, M. C., Hudson, J. I., Greenfield, S. F., & Gunderson, J. G. (2017). Functional outcomes in community-based adults with borderline personality disorder. *Journal of psychiatric research, 89*, 105-114. doi: 10.1016/j.jpsychires.2017.01.010.

Keeley, J. W., Flanagan, E. H., & McCluskey, D. L. (2014). Functional impairment and the DSM-5 dimensional system for personality disorder. *Journal of personality disorders, 28*(5), 657.

Krueger, R. F., Derringer, J., Markon, K., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptative personality trait model and inventory for DSM-5. *Psychological Medicine, 42*, 1879 - 1890. doi: 10.1017/S0033291711002674.

Krueger, R. F., Markon, K. E. (2006). Reinterpreting comorbidity: a model-based approach to understanding and classifying psychopathology. *Annual Review of Clinical Psychology, 2*, 111–33. doi: 10.1146/annurev.clinpsy.2.022305.095213.

Krueger, R. F., & Markon, K. E. (2014). The role of the DSM-5 personality trait model in moving toward a quantitative and empirically based approach to classifying personality and psychopathology. *Annual Review of Clinical Psychology, 10*, 477-501. doi: 10.1146/annurev-clinpsy-032813-153732.

Krueger, R. F., McGue, M., & Iacono, W. G. (2001). The higher-order structure of common DSM mental disorders: Internalization, externalization, and their connections to personality. Personality and Individual Differences, 30(7), 1245-1259. doi: 10.1016/S0191-8869(00)00106-9.

Lorenzo-Seva, U., & Ten Berge, J. M. (2006). Tucker's congruence coefficient as a meaningful index of factor similarity. *Methodology, 2*(2), 57-64.

Maples, J. L., Carter, N. T., Few, L. R., Crego, C., Gore, W. L., Samuel, D. B., ... & Krueger, R. F. (2015). Testing whether the DSM-5 personality disorder trait model can be measured with a reduced set of items: An item response theory investigation of the Personality Inventory for DSM-5. *Psychological assessment, 27*(4), 1195. Doi: 10.1037/pas0000120.

Markon, K. E., Krueger, R. F., & Watson, D. (2005). Delineating the structure of normal and abnormal personality: an integrative hierarchical approach. *Journal of personality and social psychology*, *88*(1), 139. doi: 10.1037/0022-3514.88.1.139.

Morey, L. C., Benson, K. T., Busch, A. J., & Skodol, A. E. (2015). Personality disorders in DSM-5: emerging research on the alternative model. *Current psychiatry reports, 17*(4), 1-9. doi: 10.1007/s11920.015.0558-0.

Morey, L. C., Krueger, R. F., & Skodol, A. E. (2013). The hierarchical structure of clinician ratings of proposed DSM–5 pathological personality traits. *Journal of abnormal psychology*, *122*(3), 836.

Mullins-Sweatt, S. N., & Widiger, T. A. (2009). Clinical utility and DSM-5. *Psychological assessment, 21*, 302, 312. doi: 10.1037/a0016607.

Muthén, B., & Asparouhov, T. (2011). Beyond multilevel regression modeling: Multilevel analysis in a general latent variable framework. In Hox, J., & Roberts, J. K. (Eds.). (*Handbook of advanced multilevel analysis,* 15-40. New York: Taylor Francis Psychology Press.

Nunnally, J. C., & Bernstein, I. H. (1994). The assessment of reliability. *Psychometric theory, 3*(1), 248-292.

Quello, S. B., Brady, K. T., & Sonne, S. C. (2005). Mood disorders and substance use disorder: a complex comorbidity. *Science & Practice Perspectives*, *3*(1), 13.

Quilty, L. C., Ayearst, L., Chmielewski, M., Pollock, B. G., & Bagby, R. M. (2013). The psychometric properties of the Personality Inventory for DSM-5 in an APA DSM-5 field trial sample. *Assessment, 20*(3), 362-369. doi: 10.1177/1073191113486183.

Ready, R. E., Watson, D., & Clark, L. A. (2002). Psychiatric patient–and informant-reported personality: Predicting concurrent and future behavior. *Assessment, 9*(4), 361-372. doi: 10.1177/1073191102238157.

Riegel, K. D., Preiss, M., Ksinan, A., Michalec, J., Samánková, D., & Harsa, P. (2017). Psychometric properties of the Czech version of the Personality Inventory for DSM-5: internal consistency, validity and discrimination capacity of the measure. *Ceskoslovenska Psychologie, 61*(2), 128.

Roskam, I., Galdiolo, S., Hansenne, M., Massoudi, K., Rossier, J., Gicquel, L., & Rolland, J. P. (2015). The psychometric properties of the French version of the Personality Inventory for DSM–5. *PLoS ONE, 10*, e0133413. doi: 10.1371/journal.pone.0133413.

Samuel, D. B., Hopwood, C. J., Krueger, R. F., Thomas, K. M., & Ruggero, C. J. (2013). Comparing methods for scoring personality disorder types using maladaptive traits in DSM-5. *Assessment, 20*(3), 353-361. doi: 10.1177/1073191113486182.

Sellbom, M., Anderson, J. L., & Bagby, R. M. (2013). Assessing DSM–5 Section III personality traits and disorders with the MMPI–2–RF. *Assessment, 20*, 709–722. doi: 10.1177/1073191113508808.

Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., ... & Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (MINI):

the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of clinical psychiatry, 59*(20):22–33.

Streiner, D. L. (2003). Starting at the beginning: an introduction to coefficient alpha and internal consistency. *Journal of personality assessment, 80*(1), 99-103.

Strickland, C. M., Drislane, L. E., Lucy, M., Krueger, R. F., & Patrick, C. J. (2013). Characterizing psychopathy using DSM-5 personality traits. *Assessment, 20*(3), 327-338. doi: 10.1177/1073191113486691.

Skodol, A. E. (2012). Personality disorders in DSM-5. *Annual review of clinical psychology, 8,* 317-344.

Suzuki, T., Samuel, D. B., Pahlen, S., & Krueger, R. F. (2015). DSM-5 alternative personality disorder model traits as maladaptive extreme variants of the five-factor model: An item-response theory analysis. *Journal of abnormal psychology, 124*(2), 343. doi: 10.1037/abn0000035.

Thimm, J. C., Jordan, S., & Bach, B. (2016a). Hierarchical structure and cross-cultural measurement invariance of the Norwegian version of the Personality Inventory for DSM-5. *Journal of Personality Assessment, 99*(2), 204 – 210. doi: 10.1080/00223891.2016.1223682.

Thimm, J. C., Jordan, S., & Bach, B. (2016b). The Personality Inventory for DSM-5 Short Form (PID-5-SF): psychometric properties and association with big five traits and pathological beliefs in a Norwegian population. *BMC Psychology, 4*, 61. doi: 10.1186/s40359-016-0169-5.

Thomas, K. M., Yalch, M. M., Krueger, R. F., Wright, A. G., Markon, K. E., & Hopwood, C. J. (2013). The convergent structure of DSM-5 personality trait facets and five-factor model trait domains. *Assessment, 20*(3), 308-311. doi: 10.1177/1073191112457589.

Van den Broeck, J., Bastiaansen, L., Rossi, G., Dierckx, E., & De Clercq, B. (2013). Age-neutrality of the trait facets proposed for personality disorders in DSM-5: A DIFAS analysis of the PID-5. *Journal of Psychopathology and Behavioral Assessment, 35*(4), 487-494.

Van den Broeck, J., Bastiaansen, L., Rossi, G., Dierckx, E., De Clercq, B., & Hofmans, J. (2014). Hierarchical structure of maladaptive personality traits in older adults: joint factor analysis of the PID-5 and the DAPP-BQ. *Journal of personality disorders*, *28*(2), 198.

Verheul, R., & Widiger, T. A. (2004). A meta-analysis of the prevalence and usage of the personality disorder not otherwise specified (PDNOS) diagnosis. *Journal of Personality Disorders, 18,* 309 –319. doi: 10.1521/pedi.2004.18.4.309.

Watson, D., Stasik, S. M., Ro, E., & Clark, L. A. (2013). Integrating normal and pathological personality: Relating the DSM-5 trait-dimensional model to general traits of personality. *Assessment, 20,* 312–326.

Weaver T, Madden P, Charles V, Stimson G, Renton A, Tyrer P, et al. (2003) Comorbidity of substance misuse and mental illness in community mental health and substance misuse services. *British Journal of Psychiatry, 183,* 304-13. doi: 10.1192/bjp.183.4.304.

Widiger, T. A., & Samuel, D. B. (2005). Diagnostic categories or dimensions? A question for the Diagnostic and statistical manual of mental disorders. *Journal of abnormal psychology*, *114*(4), 494. doi: 10.1037/0021-843X.114.4.494.

Widiger, T. A., & Trull, T. J. (2007). Plate tectonics in the classification of personality disorder: shifting to a dimensional model. *American Psychologist, 62*(2), 71. doi: 10.1037/0003-066X.62.2.71.

Wright, A. G. Calabrese, W. R, Rudick, M. M., Yam, W. H., Zelanzy, K., Williams, T. F., Rotterdam, J. H. & Simms, L. J. (2015). Stability of the DSM-5 Section II pathological traits and their longitudinal associations with psychosocial functioning in personality disordered individuals. Journal of abnormal Psychology, 124(1), 199-207. doi: 10.1037/abn0000018.

Wright, A. G., Pincus, A. L., Hopwood, C. J., Thomas, K. M., Markon, K. E., & Krueger, R. F. (2012). An interpersonal analysis of pathological personality traits in DSM- 5. *Assessment, 19*, 263– 275. doi:10.1177/1073191112446657

Wright, A. G., & Simms, L. J. (2014). On the structure of personality disorder traits: Conjoint analyses of the CAT-PD, PID-5 and NEO-PI3 trait models. *Personality Disorders: Theory, research and treatment, 5,* 43-54. doi: 10.1037/per0000037.

Wright, A. G. C., Thomas, K. M., Hopwood, C. J., Markon, K. E., Pincus, A. L., & Krueger, R. F. (2012). The hierarchical structure of DSM–5 pathological personality traits. *Journal of Abnormal Psychology, 121*, 951–957. doi: 10.1037/a0027669.

Yam, W. H., & Simms, L. J. (2014). Comparing criterion-and trait-based personality disorder diagnoses in DSM-5. *Journal of abnormal psychology, 123*(4), 802. doi: 10.1037/a0037633.

Zimmermann, J., Altenstein, D., Krieger, T., Holtforth, M. G., Pretsch, J., Alexopoulos, J.,...Leising, D. (2014). The structure and correlates of self-reported DSM–5 maladaptive personality traits: Findings from two German-speaking samples. *Journal of Personality Disorders, 28,* 518– 540. doi: 10.1521/pedi_2014_28_130.

Table 1. Summary statistics and internal consistency (n = 282)

	M	*SD*	α	Mean inter-item correlation	Mean item-scale correlation
Anhedonia	1.40	0.86	.73	.41	.52
Anxiousness	1.91	0.79	.68	.35	.47
Attention Seeking	0.76	0.86	.86	.62	.70
Callousness	0.47	0.59	.64	.32	.43
Deceitfulness	0.80	0.82	.77	.46	.57
Depressivity	0.94	0.92	.84	.56	.67
Distractibility	1.73	0.88	.77	.46	.56
Eccentricity	1.38	0.87	.74	.42	.53
Emotional Lability	1.68	0.84	.66	.32	.44
Grandiosity	0.56	0.62	.63	.29	.38
Hostility	1.15	0.89	.77	.47	.59
Impulsivity	1.66	0.87	.77	.46	.58
Intimacy Avoidance	0.98	1.06	.89	.67	.76
Irresponsibility	1.11	0.76	.59	.25	.34
Manipulativeness	0.78	0.82	.79	.48	.60
Perceptual Dysregulation	0.69	0.72	.66	.32	.46
Perseveration	1.45	0.85	.70	.37	.48
Restricted Affectivity	1.21	0.80	.65	.32	.44
Rigid Perfectionism	1.32	0.84	.67	.34	.47
Risk Taking	1.19	0.95	.82	.54	.62
Separation Insecurity	1.60	0.90	.72	.39	.52
Submissiveness	0.86	0.80	.80	.50	.61
Suspiciousness	1.31	0.81	.62	.29	.40
Unusual Beliefs & Experiences	1.09	0.77	.60	.27	.38
Withdrawal	1.19	0.80	.67	.34	.45

Negative Affect	1.73	0.64	.84		
Detachment	1.19	0.70	.86		
Antagonism	.71	0.62	.88		
Disinhibition	1.50	0.04	.83		
Psychoticism	1.05	0.63	.80		

Table 2. Test-retest reliability (n = 65)

	Measure 1		Measure 2 (two-weeks interval)			
	M	*DT*	*M*	*DT*	*d*	*r*
Anhedonia	1.10	0.72	0.98	0.67	0.17	.723
Anxiousness	2.00	0.67	1.72	0.73	0.39	.569
Attention Seeking	0.93	0.86	0.84	0.81	0.10	.830
Callousness	0.52	0.67	0.45	0.58	0.11	.702
Deceitfulness	0.98	0.89	0.93	0.84	0.05	.833
Depressivity	0.71	0.77	0.49	0.64	0.31	.780
Distractibility	1.68	0.85	1.39	0.91	0.27	.614
Eccentricity	1.41	0.84	1.11	0.87	0.35	.811
Emotional Lability	1.69	0.74	1.62	0.78	0.09	.627
Grandiosity	0.54	0.61	0.43	0.54	0.19	.643
Hostility	1.05	0.78	1.08	0.73	0.03	.668
Impulsivity	1.66	0.89	1.60	0.81	0.07	.671
Intimacy Avoidance	0.67	0.87	0.68	0.88	0.01	.682
Irresponsibility	1.20	0.81	1.13	0.76	0.08	.746
Manipulativeness	1.03	0.91	0.94	0.91	0.09	.817
Perceptual Dysregulation	0.78	0.71	0.51	0.66	0.39	.653
Perseveration	1.38	0.85	1.22	0.73	0.20	.701
Restricted Affectivity	1.16	0.84	1.19	0.76	0.03	.756
Rigid Perfectionism	1.60	0.82	1.55	0.72	0.06	.613
Risk Taking	1.80	0.90	1.65	0.91	0.16	.749
Separation Insecurity	1.74	0.88	1.56	0.85	0.20	.676
Submissiveness	0.79	0.78	0.69	0.73	0.13	.605
Suspiciousness	1.40	0.89	1.21	0.81	0.26	.826
Unusual Beliefs & Experiences	0.98	0.82	0.90	0.79	0.09	.771
Withdrawal	0.89	0.78	0.77	0.75	0.15	.832

Negative Affect	1.73	0.57	1.67	0.60	0.10	.709
Detachment	0.97	0.62	0.80	0.60	0.27	.806
Antagonism	0.90	0.68	0.79	0.66	0.16	.875
Disinhibition	1.48	0.66	1.40	0.68	0.11	.803
Psychoticism	1.05	0.60	0.86	0.66	0.30	.817

Table 3. Zero order correlations Between PID5 Scores and WHODAS 2.0 Functioning Variables (n = 282)

	Understanding and comunicating	Getting around	Self-care	Getting along with people	Life activities	Participation in society
Anhedonia	.403	.247	.268	.361	.382	.403
Anxiousness	.434	.386	.341	.404	.365	.551
Attention Seeking	.046	.011	.006	.073	.068	.102
Callousness	.064	-.005	-.008	.098	-.003	.048
Deceitfulness	.272	.069	.117	.282	.150	.208
Depressivity	.346	.434	.360	.465	.424	.403
Distractibility	.560	.225	.215	.347	.292	.422
Eccentricity	.513	.232	.266	.404	.425	.456
Emotional Lability	.192	.196	.293	.175	.233	.292
Grandiosity	.135	-.004	.041	.153	.072	.140
Hostility	.222	.089	.176	.188	.181	.208
Impulsivity	.163	.115	.184	.143	.120	.132
Intimacy Avoidance	.180	.150	.114	.259	.200	.154
Irresponsibility	.415	.265	.187	.357	.370	.447
Manipulativeness	.032	.103	.061	.175	.067	.065
Perceptual Dysregulation	.300	.136	.200	.289	.209	.397
Perseveration	.341	.227	.172	.381	.245	.321
Restricted Affectivity	.126	.173	.130	.158	.040	-.009
Rigid Perfectionism	.112	.058	.072	.136	.036	.004
Risk Taking	.231	.131	.086	.146	.117	.192
Separation Insecurity	.215	.229	.282	.248	.172	.186
Submissiveness	.410	.265	.207	.374	.288	.378
Suspiciousness	.325	.189	.205	.320	.148	.317
Unusual Beliefs & Experiences	.271	.257	.270	.200	.132	.312
Withdrawal	.370	.350	.320	.343	.265	.350

Note: for $r > .271$, $p < .01$; for $.270 > r > .205$, $p < .05$

Table 1. Summary statistics and internal consistency (n = 282)

	M	*SD*	α	Mean inter-item correlation	Mean item-scale correlation
Anhedonia	1.40	0.86	.73	.41	.52
Anxiousness	1.91	0.79	.68	.35	.47
Attention Seeking	0.76	0.86	.86	.62	.70
Callousness	0.47	0.59	.64	.32	.43
Deceitfulness	0.80	0.82	.77	.46	.57
Depressivity	0.94	0.92	.84	.56	.67
Distractibility	1.73	0.88	.77	.46	.56
Eccentricity	1.38	0.87	.74	.42	.53
Emotional Lability	1.68	0.84	.66	.32	.44
Grandiosity	0.56	0.62	.63	.29	.38
Hostility	1.15	0.89	.77	.47	.59
Impulsivity	1.66	0.87	.77	.46	.58
Intimacy Avoidance	0.98	1.06	.89	.67	.76
Irresponsibility	1.11	0.76	.59	.25	.34
Manipulativeness	0.78	0.82	.79	.48	.60
Perceptual Dysregulation	0.69	0.72	.66	.32	.46
Perseveration	1.45	0.85	.70	.37	.48
Restricted Affectivity	1.21	0.80	.65	.32	.44
Rigid Perfectionism	1.32	0.84	.67	.34	.47
Risk Taking	1.19	0.95	.82	.54	.62
Separation Insecurity	1.60	0.90	.72	.39	.52
Submissiveness	0.86	0.80	.80	.50	.61
Suspiciousness	1.31	0.81	.62	.29	.40
Unusual Beliefs & Experiences	1.09	0.77	.60	.27	.38
Withdrawal	1.19	0.80	.67	.34	.45

Negative Affect	1.73	0.64	.84		
Detachment	1.19	0.70	.86		
Antagonism	.71	0.62	.88		
Disinhibition	1.50	0.04	.83		
Psychoticism	1.05	0.63	.80		

Table 2. Test-retest reliability (n = 65)

	Measure 1		Measure 2 (two-weeks interval)			
	M	*DT*	*M*	*DT*	*d*	*r*
Anhedonia	1.10	0.72	0.98	0.67	0.17	.723
Anxiousness	2.00	0.67	1.72	0.73	0.39	.569
Attention Seeking	0.93	0.86	0.84	0.81	0.10	.830
Callousness	0.52	0.67	0.45	0.58	0.11	.702
Deceitfulness	0.98	0.89	0.93	0.84	0.05	.833
Depressivity	0.71	0.77	0.49	0.64	0.31	.780
Distractibility	1.68	0.85	1.39	0.91	0.27	.614
Eccentricity	1.41	0.84	1.11	0.87	0.35	.811
Emotional Lability	1.69	0.74	1.62	0.78	0.09	.627
Grandiosity	0.54	0.61	0.43	0.54	0.19	.643
Hostility	1.05	0.78	1.08	0.73	0.03	.668
Impulsivity	1.66	0.89	1.60	0.81	0.07	.671
Intimacy Avoidance	0.67	0.87	0.68	0.88	0.01	.682
Irresponsibility	1.20	0.81	1.13	0.76	0.08	.746
Manipulativeness	1.03	0.91	0.94	0.91	0.09	.817
Perceptual Dysregulation	0.78	0.71	0.51	0.66	0.39	.653
Perseveration	1.38	0.85	1.22	0.73	0.20	.701
Restricted Affectivity	1.16	0.84	1.19	0.76	0.03	.756
Rigid Perfectionism	1.60	0.82	1.55	0.72	0.06	.613
Risk Taking	1.80	0.90	1.65	0.91	0.16	.749
Separation Insecurity	1.74	0.88	1.56	0.85	0.20	.676
Submissiveness	0.79	0.78	0.69	0.73	0.13	.605
Suspiciousness	1.40	0.89	1.21	0.81	0.26	.826
Unusual Beliefs & Experiences	0.98	0.82	0.90	0.79	0.09	.771
Withdrawal	0.89	0.78	0.77	0.75	0.15	.832

Negative Affect	1.73	0.57	1.67	0.60	0.10	.709
Detachment	0.97	0.62	0.80	0.60	0.27	.806
Antagonism	0.90	0.68	0.79	0.66	0.16	.875
Disinhibition	1.48	0.66	1.40	0.68	0.11	.803
Psychoticism	1.05	0.60	0.86	0.66	0.30	.817

Table 3. Zero order correlations Between PID5 Scores and WHODAS 2.0 Functioning Variables (n = 282)

	Understanding and comunicating	Getting around	Self-care	Getting along with people	Life activities	Participation in society
Anhedonia	.403	.247	.268	.361	.382	.403
Anxiousness	.434	.386	.341	.404	.365	.551
Attention Seeking	.046	.011	.006	.073	.068	.102
Callousness	.064	-.005	-.008	.098	-.003	.048
Deceitfulness	.272	.069	.117	.282	.150	.208
Depressivity	.346	.434	.360	.465	.424	.403
Distractibility	.560	.225	.215	.347	.292	.422
Eccentricity	.513	.232	.266	.404	.425	.456
Emotional Lability	.192	.196	.293	.175	.233	.292
Grandiosity	.135	-.004	.041	.153	.072	.140
Hostility	.222	.089	.176	.188	.181	.208
Impulsivity	.163	.115	.184	.143	.120	.132
Intimacy Avoidance	.180	.150	.114	.259	.200	.154
Irresponsibility	.415	.265	.187	.357	.370	.447
Manipulativeness	.032	.103	.061	.175	.067	.065
Perceptual Dysregulation	.300	.136	.200	.289	.209	.397
Perseveration	.341	.227	.172	.381	.245	.321
Restricted Affectivity	.126	.173	.130	.158	.040	-.009
Rigid Perfectionism	.112	.058	.072	.136	.036	.004
Risk Taking	.231	.131	.086	.146	.117	.192
Separation Insecurity	.215	.229	.282	.248	.172	.186
Submissiveness	.410	.265	.207	.374	.288	.378
Suspiciousness	.325	.189	.205	.320	.148	.317
Unusual Beliefs & Experiences	.271	.257	.270	.200	.132	.312
Withdrawal	.370	.350	.320	.343	.265	.350

Note: for $r > .271$, $p < .01$; for $.270 > r > .205$, $p < .05$