



Evaluation of the PID-5 depressivity personality dimensions and depressive symptomatology in a community sample

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Título: Evaluación de las dimensiones de la personalidad depresiva en el PID-5 y de la sintomatología depresiva en una muestra comunitaria.

Resumen: El modelo alternativo para la clasificación de los trastornos de la personalidad presentado en el DSM-5 se basa en la hipótesis de continuidad entre la personalidad normal y los trastornos de la personalidad. El objetivo principal de este estudio es analizar la relación entre la sintomatología depresiva y los dominios y facetas del PID-5, especialmente la faceta Depresión. Se utilizó una muestra de conveniencia de la población general (N = 453). Los participantes respondieron al PID-5 y a la CES-D. En un modelo de regresión múltiple que incluía todas las facetas de PID-5, solo la Depresión y la Anhedonia tuvieron un efecto individual significativo en la predicción de la puntuación CES-D. El análisis de correlación sugirió que la Depresión y la Anhedonia podrían considerarse como la definición de los rasgos depresivos de los trastornos de la personalidad y apoyó la continuidad entre estos trastornos y la sintomatología depresiva. Un análisis taxométrico con la faceta Depresión y la puntuación CES-D como indicadores respaldó la naturaleza dimensional de la depresión en un sentido amplio (rasgos depresivos / sintomatología depresiva).

Palabras clave: Trastorno depresivo de la personalidad. Depresión. Síntomas depresivos. Análisis taxométrico. PID-5.

Abstract: The alternative model for the classification of personality disorders presented in the DSM-5 is based on the hypothesis of continuity between normal personality and personality disorders. The main objective of this study is to analyze the relationship between depressive symptomatology and the domains and facets of the PID-5, especially the Depressivity facet. A convenience sample of the general population (N = 453) was used. Participants responded to the PID-5 and the CES-D. In a multiple regression model including all the PID-5 facets, only Depressivity and Anhedonia had a significant individual effect on predicting the CES-D score. Correlation analysis suggested that Depressivity and Anhedonia could be considered as defining the depressive traits of personality disorders and supported the continuity between these disorders and depressive symptomatology. A Taxometric Analysis with the Depressivity facet and CES-D score as indicators supported the dimensional nature of depressivity in a broad sense (depressive traits/ depressive symptomatology).

Keywords: Depressive personality disorder. Depression. Depressive symptoms. Taxometric analysis. PID-5.

Introduction

The alternative proposal for the classification of personality disorders (PD) presented in the 5th edition of the *Diagnostic and statistical manual of mental disorders* (DSM-5; American Psychiatric Association, 2013) is based on a dimensional perspective of psychopathology and on the hypothesis of continuity between normal personality variations and PD (Krueger & Markon, 2014; Trull & Widiger, 2013). In this alternative model, diagnosis of a personality disorder is based on the evaluation of personality functioning level (Criterion A) and on the presence of specific pathological trait constellations (Criterion B) evaluated with the Personality Inventory for DSM-5 (PID-5; Krueger et al., 2012). The PID-5 evaluates the presence of 25 pathological personality traits (facets), which are grouped into five higher order domains of personality variation: Negative Affectivity vs. Emotional Stability, Detachment vs. Extraversion, Antagonism vs. Agreeableness, Disinhibition vs. Conscientiousness, and Psychoticism vs. Lucidity.

The dimensional perspective in psychopathology can be generalized to include the continuity of all the psychopathological entities and normality variations (Krueger & Piasecki, 2002; Suzuki et al., 2015). The continuity perspective namely

implies a focus on sub-threshold pathology. In a longitudinal study, Shankman et al. (2009) showed that subthreshold depression, as other subthreshold conditions, are often precursors for full syndrome disorders.

From this perspective, a continuity is likely between the clinical disorders designated by the 3rd and 4th edition of the *Diagnostic and statistical manual of mental disorders* (DSM-III, DSM-IV; American Psychiatric Association, 1980,1994) as Axis I disorders and the PD related to Axis II in this classification system (Coid et al., 2006; Krueger, 2005). However, it is not likely that a biunivocal correspondence can be established between the various PD and Axis I disorders (Links & Eynan, 2013; Siever & Davis, 1991).

Depression is probably the nosological entity in which the dimensional perspective, has been more often defended. Sub threshold depression, mild depression, major depression and chronic depression appear to be part of a continuum rather than discrete categories (Klein et al., 2006; Lewinsohn et al., 2000; Remick et al., 1996). The extent to which depression is better conceptualized in a categorical or a dimensional manner has received a great research attention in recent years by using Taxometric Analysis. Some studies support the dimensional nature of depression (Eulálio et al., 2015; Franklin et al., 2002; Hankin et al., 2005; Ruscio & Ruscio, 2000) while others find evidence of taxonicity at least for some sets of symptoms or some subtypes of depression (Beach & Amir, 2003; Haslam & Beck, 1994; Ruscio, et al., 2007). In these studies, self report symptomatic depression

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(Article received: 19-07-2021; reviewed: 21-09-2021; accepted: 24-02-2022)

scales or semi structured interviews according to DSM-IV symptomatic criteria, have been used.

Several forms of articulation between personality structure and clinical depression have been proposed. Some of these models assume that personality and depression have common causal influences but have no causal relationship with each other. Others assume that personality has a causal effect on the occurrence of depression, while a causal relationship in the opposite direction is assumed by other models (Klein et al., 2011). From the perspective under discussion, it may be said that some models tend to situate personality variations and depression on a continuum, suggesting the possibility of a specific relationship between certain personality traits and depression (continuous or spectral models, but also precursor or predisposition models). Others, such as the so-called pathoplastic models, clearly assume a non-specific relationship, in which case there would not be a personality structure with a privileged connection to the eventual occurrence of a depressive disorder. The diathesis-stress model (Bebbington, 1987; Colodro-Conde et al., 2018; Monroe & Simons, 1991) may be included in the predisposition view. It conceptualizes personality as the diathesis or vulnerability, and stress related to context factors as a moderator or a mediator that precipitates the depressive disorder. Stressful life events are a good example of these context factors (e.g. Brown et al., 1993).

The problem of the relationship between depression and personality brings us to the concept of depressive personality or Depressive Personality Disorder. This concept was listed in the section for further research within DSM-IV but finally not included in DSM-5. One of the reasons evoked for not accepting it was the difficulty in distinguishing a Depressive Personality Disorder from the chronic forms of depressive disorder or Dysthymia (American Psychiatric Association, 1994, p. 732). The issue is controversial. It is possible to distinguish the two diagnoses (Klein, 1990, 1999) but they strongly overlap (Ryder et al., 2001; Ryder et al., 2002). Most studies on the relationship between depression and PD do not include Depressive Personality Disorder and generally find that depression is related to several forms of PD (Alnaes & Torgersen, 1997; Casey et al., 2004; Corruble et al., 1996). These findings do not suggest that there is one maladaptive personality trait (or set of traits) specifically related to clinical depression. An alternative view, for instance, is that differences in personality structure would only influence the expression of the disorder (Klein et al., 2011).

Several studies have been published that point to a relationship between depressive symptomatology or depressive disorders and normal personality traits, which tends to confirm the perspective of continuity. Studies referring to the Big Five Factors model, operationalized by NEO-PI-R or NEO-FFI (Costa & McCrae, 2000), have found a relationship between depression or depressive symptomatology and high scores in Neuroticism and low scores in Extroversion and Conscientiousness (e.g., Hayward et al., 2013; Petersen et al., 2001). Based on a meta-analysis, Kotov et al. (2010)

concluded that Major Depression is mainly associated with very high Neuroticism and low Conscientiousness. The relationship with low Extroversion appears to be more modest and somewhat incoherent: some studies find a relationship in the opposite direction (e.g. Aggen et al., 2005). These relationships do not appear to be specific. Similar relationships exist with several other psychopathological disorders (Malouff et al., 2005).

Many of these studies are based on clinical samples and use clinical diagnosis. A study with a large sample of the Korean general population used the *Center for Epidemiologic Studies Depression Scale* (CES-D; Radloff, 1977) and found similar relations between the depressive symptomatology evaluated by CES-D and the NEO-PI-R (Kim et al., 2016): high Neuroticism and low Extraversion were related to depressive symptomatology. Chioqueta and Stiles (2005) concluded that Angry hostility and Depression facets positively predicted depressive symptoms assessed by a depressive scale in university students. In a longitudinal study with the *Faceted Inventory of the Five Factor Model* (FI-FFM; Watson et al., 2019), Goldstein et al. (2018) found that higher depression and lower positive emotionality and sociability (facets of the FI-FFM) predicted the first onset of depression in a sample of adolescent girls. A recent study with university students, sought to link the results in the PID-5 domains with externalizing and internalizing disorders, including depression (Sleep et al., 2017). Depression was assessed with an 8-item questionnaire, the results of which were highly correlated with the results of the CES-D (Pikonis et al., 2011). Sleep et al. (2017) found that the score on this depression scale correlated with scores on the Negative Affectivity and Detachment domains of the PID-5. The relationships with the other domains were less important and were no longer significant when taking into account the effect of the two mentioned variables in a multivariate analysis. No analysis of the PID-5 results at the facet level was presented.

Hopwood et al. (2012) studied the relationship between PID-5 domains and facets and personality disorders, including the Depressive Personality Disorder (DPD), in a sample of undergraduates. At the facet level, higher correlations with DPD were found in Anxiousness, Depressivity and Anhedonia. However, published studies tend to focus on the NEO-PI-R or the PID-5 domains. One reason for this may be that there appears to be a relatively clear match between the NEO-PI-R domains and the PID-5 domains. Effectively, research has shown that the Negative Affectivity, Detachment, Antagonism, and Disinhibition domains of the PID-5 are maladaptive variants of the respective Neuroticism, Extroversion, Agreeableness, and Conscientiousness dimensions of the Five Factor Model (FFM; Costa & Widiger, 2012; Skodol et al., 2011; Suzuki et al., 2015; Suzuki et al., 2017; Thomas et al., 2013; Wright et al., 2017). The relationship between the Psychotic domain of the PID-5 and the Openness domain of the FFM has been shown to be more ambiguous (e.g., Sleep et al., 2017). Moreover, the facet-level relationships appear more complex and more difficult to in-

terpret. More specifically, there is no perfect correspondence between the NEO-PI-R Depression facet and the PID-5 Depressivity facet (Griffin & Samuel, 2014).

The Depressivity facet has been considered interstitial, since in some studies it appears to be close to Detachment and in others it is close to Negative Affectivity. In a recent meta-analysis, Watters and Bagby (2018) found that this facet loaded $> .30$ in three domains, namely Negative Affectivity, Detachment and Disinhibition. With regard to the NEO-PI-R, it tends to situate itself between Neuroticism and Extroversion (Griffin & Samuel, 2014). Considering the correspondence between the major PID-5 and NEO-PI-R domains, this result can be paralleled with the above mentioned studies that relate the occurrence of depression or depressive symptomatology to high scores in Neuroticism and low scores in Extroversion. This correspondence tends indirectly to confirm that Depressivity represents a personality facet that is specifically related to depressive disorders. However, several studies combining the PID-5 and the NEO PI-R (or other scales related to the Five Factor Model), found that Depressivity only had a meaningful loading on Negative Affectivity/Neuroticism (Crego et al., 2018; De Fruyt et al., 2013; Watters, Selbom et al., 2019).

Hence, it would be interesting to study the relationship between the Depressivity facet of the PID-5 and the occurrence of depressive symptomatology. The results obtained considering only the broad domains of PID-5 do not allow any clear conclusion, especially since the score obtained in the Depressivity facet is not included in the calculation of any of the domains score.

The above-mentioned studies on depression using Taxometric Analysis have focused mainly on the possible dimensionality of depression defined as a set of symptoms (e.g., Ruscio & Ruscio, 2000; Ruscio, Zimmerman et al., 2007). In this study, depressive symptomatology and stable maladaptive personality traits (PID-5 Depressivity facet) were analysed. Establishing the continuity between personality traits and depression has implications for conceptualization and treatment (Klein et al., 2011). To our knowledge, this problem has not yet been addressed using Taxometric Analysis.

The relationship between depression and maladaptive personality is an important topic of research (Behn et al., 2018) with relevant clinical implications (Klein et al., 2011). Global domain level results from studies with the PID-5 may be misleading. We expect a specific facet level analysis to explain this relationship in a simpler and more coherent form. We also expect to show that the continuity hypothesis is the theoretical frame that best fits our results.

Methods

Objectives

The first objective of this study is to define the PID-5 facets specifically related to depressive symptomatology. In line with the literature on Depressive Personality Disorder (Hopwood et al., 2012); we expect depressive symptomatology

to be related to Depressivity, but also to Anhedonia and Anxiousness. This facet level analysis is expected to enhance understanding of the PID-5 lower structure, namely the position of the Depressivity facet. The definition of a facet or set of facets specifically related to depressive symptomatology is also a relevant issue from the perspective of both convergent and discriminant validity of the PID-5.

Moreover, this study makes a transcultural comparison between the results of the Portuguese version of the PID-5 with a sample of the general Portuguese population with those of the original studies. Finding common psychometric characteristics despite cultural differences might support the construct validity of the Pid-5.

Finally, we hope that the results may contribute to the discussion of the relations between clinical disorders and PD. The continuity hypothesis leads us to predict a close relationship, possibly even a difficulty in clearly distinguishing depressive personality traits from depressive symptoms. More precisely, we will try to ascertain whether Depressivity and depressive symptomatology may be conceived as being a single dimension, “depressivity” in a broad sense. This dimension would vary continuously between depressive personality traits and depressive symptoms. In the alternative categorical view, depressive disorder and depressive symptomatology might appear in several forms of personality disorder, but there would not be a personality dimension (or a PID-5 facet) with a specific connection to the occurrence of this symptomatology (Luyten et al., 2006).

Participants

This study is based on a convenience sample of the Portuguese general population, mostly from the Lisbon area ($N = 453$). The main characteristics of this sample are presented in Table 1. A preliminary study with a sample of Portuguese undergraduate students ($N = 243$) with a majority of females (84.8%) and a mean age of 20.64 years ($SD = 4.63$) was conducted. Only some results of this preliminary study will be mentioned to enable a comparison with the results of Sleep et al. (2017) who also studied a student sample.

Table 1
Characteristics of the Sample (N = 453).

Age	$M = 49.52$ years, $SD = 8.85$	
Sex	Male	50.3 % ($n=228$)
	Female	49.7 % ($n=225$)
Marital status	Unmarried	42.3 % ($n=191$)
	Married or cohabiting	40.5 % ($n=183$)
	Widow	7.1 % ($n=32$)
	Separated/Divorced	10.2 % ($n=46$)
Employment status	Employed	82.0 % ($n=369$)
	Retired	7.3 % ($n=33$)
	Unemployed	6.9 % ($n=31$)
	Housewife	3.8 % ($n=17$)
Schooling	< 9 years	16.5 % ($n=48$)
	9 years	15.4 % ($n=69$)
	12 years	27.4 % ($n=123$)
	Univ. degree	46.8 % ($n=210$)

Instruments

The PID-5 is a self-report questionnaire with 220 items (e.g., I'm an energetic person) grouped in 25 lower-order traits (facets). Facets are included in five broad domains: Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism. The Portuguese version of the PID-5 was found to present good psychometric properties. In the community sample, results on the internal consistency (Pires et al., 2017) were similar to those obtained with the original test (Krueger et al., 2012) and in other cross-cultural adaptations of the test (Al-Attayah et al., 2017; Al-Dajani et al., 2016; Bach et al., 2016; De Clercq et al., 2014; De Fruyt et al., 2013; Fossati et al., 2013; Gutiérrez et al., 2017; Krueger & Markon, 2014; Zimmermann et al., 2014). After four weeks, the high mean retest reliability of the facets (.79) and domains (.87) supported the dependability and stability of the test scores across time. The pattern of correlations found between the PID-5 and the Portuguese version of the *NEO Five-Factor Inventory* (NEO-FFI; Costa & McCrae, 2000; Lima et al., 2014) sustained the conceptual convergence between the PID-5 scales and the NEO-FFI domains (Krueger et al., 2014; Krueger & Markon, 2014; Maples et al., 2015; Skodol et al., 2011). Considering the factorial validity of the Portuguese PID-5 a five-factor solution emerged in the community sample (Pires et al., 2019). The extracted factors were similar to the domains described in the DSM-5 trait model (Krueger et al., 2012; Krueger & Markon, 2014), except for the last factor. However, the PID-5 departure from its original structure has been reported in the literature and justified by the interstitial location of some of the facets, appearing acceptable that the exact structure of the PID-5 shifts slightly from study to study as a consequence of the complexity of the personality structure (Gutiérrez et al., 2017; Krueger & Markon, 2014).

In the current study the Cronbach's alpha (α) of the PID-5 domains ranged from .84 (Antagonism) to .91 (Negative Affect) with a mean of .89. At the facet level, α values varied between .62 and .92 with a mean of .78. Only two facets presented a $\alpha < .70$: Irresponsibility (.62) and Manipulativeness (.64). The α values for Depressivity, Anxiousness and Anhedonia were .87, .85 and .80, respectively.

The CES-D is particularly suitable for the study of community samples (Radloff, 1977) and remains one of the most widely used depression scales in research, namely in studies on the relationship between personality and depression (Hakulinen et al., 2015; Kim et al., 2016). The scale includes 20 items regarding the way the subject may have felt or behave in the last week (e.g. I felt lonely). The global score may vary from zero to 60. A score equal to or above the cut-off point may indicate the presence of a depressive disorder. The Portuguese version of the CES-D was shown to have good psychometric properties. The α value varied between .87 and .92 and the correlation with the sum of the depressive symptoms observed in the clinical interview was .76. The proposed cut-off point is 20 for the presence of any

form of depressive disorder and 25 for the presence of MDD (Gonçalves & Fagulha, 2004). In the current study the CES-D α value was .89.

Procedure and Analysis

The study was approved by the Ethic Committee of the Faculty of Psychology. Participants were informed that taking part in the study was voluntary and they could quit at any time. It was explained that no identifying information would be asked, and that data would be used in a scientific study. Students received course credits for their participation in the preliminary study, which included not only answering the questionnaires but also contacting adults from general population to collect their answers. Participants responded to the questionnaires at home and returned them in a sealed envelope. No party involved received payment for their contributions.

In order to explore the association between personality and depressive symptoms, bivariate correlation and multiple regression analyses between CES-D score and PID-5 domains were conducted both for the student and the community samples. Bivariate correlation analysis at the facet level was only been performed for the community sample. These statistical analyses were conducted with IBM SPSS Statistic software (version 25.0; IBM Corp., 2017).

To determine the latent structure of depressivity in a broad sense, the RTaxometric, an R package for Taxometric Analysis (Ruscio & Wang, 2017), was used. Taxometric Analysis may be considered a first step in data analysis. This method is unable to identify how many factors or classes should be considered for a specific psychological phenomenon, such as depression or schizophrenia. However, it provides an indication as to whether the data analysis should be approached from a factor or class perspective. In fact, Taxometric Analysis seeks to provide evidence on a dimensional format of a construct's latent structure versus a taxonic format. In this study, this analysis was used to respond to the following question: is depressivity in a broad sense dimensional or taxonic, i.e., as far as depression is concerned, are individuals distributed along a continuum or do they constitute a discrete diagnostic entity? Meehl (1995) was responsible for the development of taxometric techniques, using several empirical methods that produce graphical results. These initial outputs required users to judge whether they appear to be more similar to the prototypical curve shapes for categorical or dimensional data. To reduce subjectivity in the interpretation of taxometric results, Ruscio, Ruscio et al. (2007) introduced a new technique to produce comparison graphs using parallel analyses of simulated categorical and dimensional data. To further reduce subjectivity, Ruscio, Ruscio et al. (2007) and Ruscio et al. (2010) also defined the Comparison Curve Fit Index (CCFI), ranging from zero to one, in which values higher than .55 are indicative of a categorical structure, below .45 are indicative of a dimensional structure, and intermediate CCFI values are considered ambiguous.

CCFI measures the extent to which the results for the empirical data are closer to those for the simulated categorical or dimensional comparison data. More recently, the determination of CCFI profiles (included in the RTaxometrics Package), using a range of base rates for categorical comparison data, has improved the ability to discriminate between categorical and dimensional data.

Results

The general population sample presented a mean score in the CES-D of 11.87 ($SD = 8.64$); 17.1% of the sample had a score equal to or above 20 and 7.4 % a score above 25. The values for the undergraduate students of the preliminary study were: $M = 16.72$, $SD = 8.37$, 29.6% equal or above 20, 16.0% above 25. Correlations among the PID-5 facets were calculated. In the relationship between Depressivity

and the other PID-5 facets, the highest values were with Anhedonia ($r = .74$) and Anxiety ($r = .62$). The correlation between Depressivity and Anhedonia was the highest value in the table of correlations among all the PID-5 facets (full results not presented).

The bivariate correlations between the PID-5 domains and the CES-D score were also calculated. A multiple regression analysis, taking scores in the PID-5 domains as independent variables and the CES-D score as the dependent variable, was conducted. In Table 2, the correlations (r) between each PID-5 domain and the dependent variable CES-D, in addition to the estimates obtained in each sample for the β coefficients are presented. Results from the community sample, the undergraduate sample, and from the study of Sleep et al. (2017), also based on a student sample from a U.S. university, are included in Table 2.

Table 2
Linear Regression Analysis Results of each PID-5 Domain on Depressive Symptomatology.

	Portuguese community sample		Portuguese student sample		U.S. student sample	
	r	β	r	β	r	β
Negative Affectivity	.49**	.28**	.52**	.35**	.50**	.33**
Detachment	.47**	.30**	.49**	.30**	.51**	.37**
Antagonism	.08	-.15*	.20**	-.01	.25**	-.09
Disinhibition	.30**	-.03	.39**	.10	.39**	.05
Psychoticism	.37**	.18*	.46**	.11	.43**	.04

* $p < .01$; ** $p < .001$

The coefficient of determination of the multiple linear regression model including all the PID-5 domains as independent variables and the CES-D score as the dependent variable was Adjusted $R^2 = .31$.

In Table 3, the correlations (r) between each PID-5 facet and the dependent variable CES-D, in addition to the estimates for the β coefficients are presented. The dependent variable is the same as that used in the previous regression but the facets (not the domains) are now the independent variables. Facets that did not correlate with the dependent variable were not included.

Table 3
Linear regression analysis results of each PID-5 facet on depressive symptomatology (community sample).

	r	β		r	β
Anhedonia	.55**	.36**	Intimacy avoidance	.26**	.02
Anxiousness	.50**	.13	Irresponsibility	.13*	-.09
Attention seeking	.13*	.04	Manipulativeness	.01	-
Callousness	.15*	.02	Perseveration	.40**	-.02
Cognitive and perceptual dysregulation	.43**	.17	Restricted affectivity	.14*	-.09
Deceitfulness	.14*	-.09	Rigid perfectionism	.26**	.02
Depressivity	.57**	.23*	Risk taking	-.05	-
Distractibility	.36**	-.05	Separation insecurity	.28**	-.10
Eccentricity	.30**	.05	Submissiveness	.28**	.03
Emotional lability	.42**	.07	Suspiciousness	.34**	.10
Grandiosity	.07	-	Unusual beliefs & experiences	.26**	-.05
Hostility	.29**	.02	Withdrawal	.33**	-.08
Impulsivity	.21**	-.06			

* $p < .01$; ** $p < .001$

There are nine facets with $r_{pb} > .30$, mostly from the Negative Affectivity (three) and Detachment(four) domains, but only Depressivity and Anhedonia have a high effect size, $r_{pb} > .50$ (Aron et al., 2013). The coefficient of determination of the multiple linear regression model including all the

PID-5 facets as independent variables and the CES-D score as the dependent variable was Adjusted $R^2 = .41$, higher than the corresponding value for the PID-5 domains and closest to the lowest acceptable value of .50. In this model including

all facets, only Depressivity and Anhedonia had a significant individual effect ($p < .01$).

Since the Depressivity and Anhedonia facets are strongly correlated and can be specifically related to depression, a new variable was defined as the sum of these two facets. This sum of the Depressivity and Anhedonia values had a correlation of .60 ($p < .001$) with the CES-D score. In order to understand whether the effect of these facets explained the observed relationship between the Negative Affectivity and Detachment domains and the CES-D score, a linear multiple regression was conducted. The Depressivity, Anhedonia and Anxiousness facets and the Negative Affectivity and Detachment domains were taken as independent variables, and the CES-D score as dependent variable. A collinearity diagnosis in this multiple regression analysis was made and the observed values of Tolerance and Variance Inflation Factor (VIF) were higher than 0.1 and lower than 10 respectively. Results are presented in Table 4.

Three indicators (the Anhedonia and Depressivity facets of PID-5 and CES-D score) were considered to perform the Taxometric Analysis of our community sample data. However, the Anhedonia facet appeared not to be a suitable indicator. Anhedonia and Depressivity combined into one indicator, representing depressive personality traits, was also

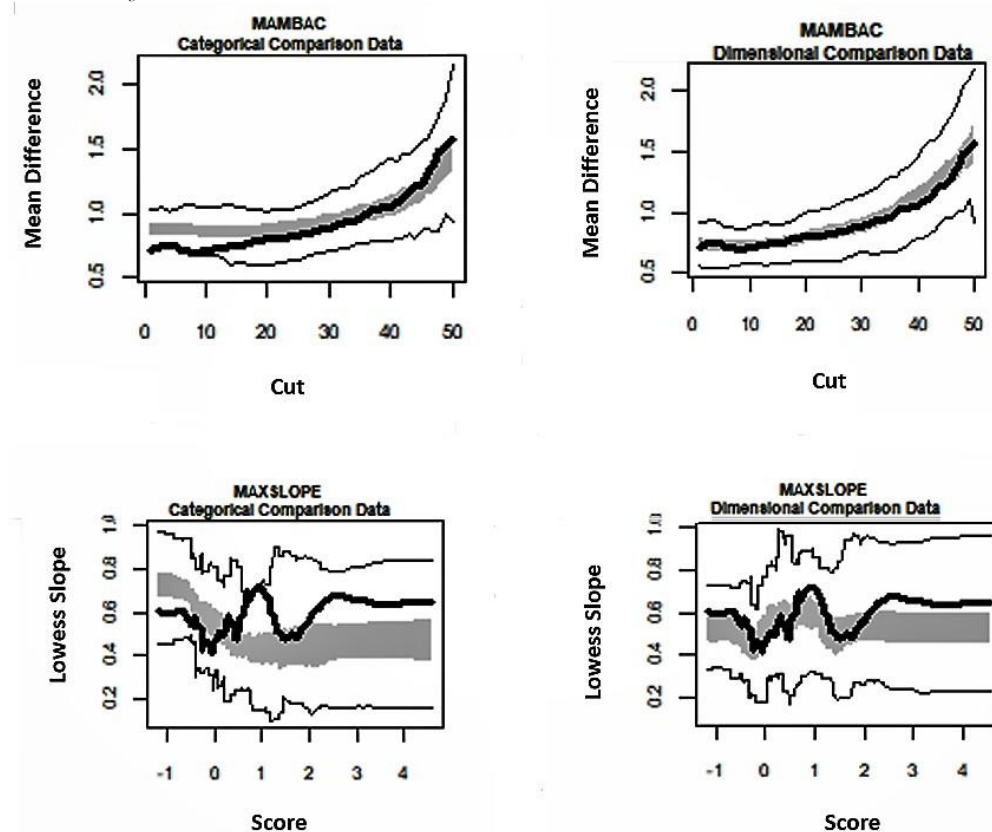
considered to perform the Taxometric Analysis, but similarly to the Anhedonia facet, this new indicator appeared not to be an adequate option. Thus, this analysis was performed with only two standardized indicators – the Depressivity facet and CES-D score. Taxometric Analysis was then conducted using two methods, the MAMBAC (Mean Above Minus Below A Cut) and the MAXSLOPE (Maximum Slope). Results are presented in Figure 1 and the CCFI mean equals 0.31, that is equal to 0.39 by MAMBAC and 0.22 by MAXSLOPE. Figure 1 clearly shows that the empirical curve (dotted line) is more similar to the simulated curve (in gray) in the dimensional condition than in the categorical.

Table 4
Multiple linear regression: main PDI-5 facets and domains as i.v. and CES-D score as dependent variable.

	B	β	p	Tolerance	VIF
Anhedonia facet	4.98	.30	.000***	.29	3.47
Depressivity facet	5.58	.28	.000***	.37	2.70
Anxiousness facet	2.62	.19	.017*	.22	4.60
Negative Affectivity Domain	0.22	.01	.868	.22	4.55
Detachment Domain	-1.53	-.08	.251	.31	3.18
Adjusted R ²		.38			

* $p < .05$ *** $p < .001$

Figure 1
Taxometric Analysis



When determining CCFI Profiles, the objective of which is to examine how the CCFI changes when the two groups (taxon and complement) differ in their relative size, Taxometric Analysis results reveals an aggregate CCFI mean of 0.39, 0.40 and 0.38 by MAMBAC and MAXSLOPE methods, respectively. Therefore, the aggregated CCFI values and Figure 1 confirm evidence of dimensionality for depressivity (depressive personality traits / depressive symptomatology).

Discussion

The results obtained in our initial study with a sample of Portuguese students are very similar to those obtained by Sleep et al. (2017) with a sample of U.S. students. Considering the cultural differences, the differences in sex composition of the samples under study, and the fact that the instruments used to evaluate depressive symptoms were different, this proximity clearly supports the validity of the PID-5, especially from a cross-cultural perspective.

The results obtained in the main study with a sample of the general population, when considering the relationship between the PID-5 domains and depressive symptomatology, were different and less clear. However, Negative Affectivity and Detachment clearly emerged as the domains that contributed most to the prediction of the CES-D score. There is, thus, some convergence with the studies on student samples. However, caution should be taken when trying to generalize results from student samples. In addition, the student sample had a very unbalanced composition in terms of sex and the percentage of individuals with scores above the cut-off point was much higher than the general population sample. Therefore, all other results presented refer exclusively to the general population sample.

Facet analysis was more enlightening than domain-level analysis. The two highest correlation coefficients with the CES-D score were related to the Depressivity and Anhedonia facets. The Depressivity and Anhedonia facets refer to two fundamental dimensions of depressive disorders (Krueger & Markon, 2014) and may even be related to what the DSM-5 considers to be the two core symptoms of a depressive episode: depressive mood and loss of interest or pleasure in activities that were usually enjoyable. The fact that the Anxiousness facet also contributed significantly to the prediction of the CES-D score should be understood considering the frequent association between depressive and anxious symptomatology. These results are in line with the results from Hopwood et al. (2012) on the correlation between DPD and PID-5 facets and tend to confirm the convergent and discriminant validity of the PID-5.

These three facets appear to explain the essential effect of the relationship between the Negative Affectivity and Detachment domains and depressive symptomatology. Indeed, when these three facets were included among the independent variables of multiple regression, the effect of domain-related variables was no longer significant.

The Depressivity facet was mainly related to the Anhedonia and Anxiousness facets. At this point, our results were very similar to those of Krueger et al. (2012). In both studies, the value of the correlation coefficient between Depressivity and Anhedonia was the highest in the table of correlations among the PID-5 facets.

This strong relationship between Depressivity and Anhedonia and between both and depressive symptomatology suggests that they could constitute a single dimension related to depression. In fact, the variable defined by the sum of the scores of these two facets presented a moderate correlation ($r = .60$) with the score on the depression scale. However, this value does not suggest total convergence. Similar values have been found for the relationship between depressive personality scales and symptomatic depressive scales in samples from the general population (e.g., Maddux et al., 2011). Inclusion of the alternative personality model in the DSM-5 was a desired development supported by the scientific community. However, there is still a need for an empirical validation of the clinical utility of this new system, especially with a view to the potential future DSM-5 proposals (Sleep et al., 2017). In this vein, these results appear to support the inclusion of a Depressive Personality Disorder defined essentially by the high values in these two PID-5 facets.

However, it is true that the adoption of a dimensional perspective relativizes the importance of the discussion on Depressive Personality Disorder and its distinction from the chronic forms of depressive disorder. Although it is always possible to translate the dimensional results into a categorical perspective by establishing trait criteria to define categorical diagnoses (Trull & Durrett, 2005; Watters, Bagby et al., 2019), but the focus then shifts to the psychopathological traits and the continuity between normal variations and psychopathology (Ryder et al., 2002). Results from the Taxometric Analysis supported this dimensional perspective. Depressive symptomatology and stable maladaptive personality traits (PID-5 Depressivity facet) may refer to the same latent construct and results support the dimensionality rather than the categorical nature of the latter.

Regardless of the definition of a Depressive Personality Disorder as a specific nosological entity, we may conclude that our results support a continuity perspective between PD and depressive symptomatology or a clinical depressive disorder. This continuity is in keeping with the view that PDs are a vulnerability or a diathesis (Tyrer, 2007, 2015) rather than a set of immutable traits. Furthermore, the relationship appears to be specifically with the Depressivity and Anhedonia facets – although, in the latter case, continuity could not be verified. Only indirectly, due to the correlations between Depressivity and Anhedonia and the other PID-5 facets, could depressive symptomatology be related to other maladaptive personality traits. This forces us to reconsider results relative to the broad PID-5 domains and, indirectly, to the NEO-PIR. The rather general relationship between Negative Affect and a number of mental disorders (Sleep et al., 2017) is in line with the results obtained for Neuroticism,

but may only be due to the analysis level and hide more specific relationships. A facet level analysis may be more useful to understand the relationship between specific mental disorders and personality.

The observed correlation between the CES-D score and the Depressivity facet may be considered a convergent validation of this facet since depressive personality traits are often related to current depressive symptoms (Chamberlain & Huprich, 2011). More studies are needed to understand the relationship with Anhedonia.

Depression is ranked by World Health Organization as the major contributor to global disability with a huge social impact (World Health Organization, 2017). Establishing the relationship between personality traits and depressive symptoms has implications for conceptualization and clinical intervention. Continuity implies a specific association between depression and certain maladaptive personality traits and assumes personality and depression arise from the same set of causal factors (Klein et al., 2011). Knowing the personality facets specifically related to depression may help to identify at-risk individuals who could benefit from early on interven-

tion. Future research should design longitudinal studies to confirm the relationship between Pid-5 results and the subsequent onset of depressive disorders.

This study has several limitations. First, it did not include a specific assessment of depressive personality disorder and it was based exclusively on self-rating instruments. Although depressive symptomatology is relatively frequent in the general population, PDs are less frequent and we do not have data on the frequency of the proposed depressive personality disorder. It would, therefore, be interesting to address the same problem with a clinical sample and compare different disorders. On the other hand, this is a correlational study: longitudinal studies are needed to support the continuity hypothesis.

Funding.- This work received national funding from FCT – Fundação para a Ciência e a Tecnologia, I.P, through the Research Center for Psychological Science of the Faculty of Psychology, University of Lisbon (UIDB/04527/2020; UIDP/04527/2020).

Conflict of Interest.- The authors declare that they have no conflict of interest.

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- [data set] Authors. (2019). The data that support the findings of this study are available from the corresponding author upon reasonable request.
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